

Discussion

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1. Introduction

To provide context for these remarks, I was Chief Executive of the Australian Bureau of Statistics from 2000 until 2007. During this time we introduced major changes to our systems for the collection, processing and dissemination of business statistics involving significant re-engineering. It also involved major changes to our organisational structure. Our inspiration came partly from discussions with Statistics Netherlands in 2003 and we started on the strategic design work shortly afterwards. This project was extremely successful – the objectives were achieved and it was completed on time and on budget. I wanted to outline the reasons I believe this was the case because I think it is relevant to the discussion of the articles in this special issue. In particular, I use our positive experience as something of a benchmark in analysing the production systems in this special issue.

First, the desired *objectives* of the redesign were quite clear and mutually supportive. They were:

- improved data quality.
- improved relations with businesses, improved reporting mechanisms and reduced reporting load.
- facilitating the increased use of administrative data, particularly taxation data.
- increased capacity to respond to emerging statistical demands.
- significant operating efficiencies by reducing the number of staff by 30 per year (about 15% per year), and
- enhanced opportunities for staff by creating units that focus on statistical outputs not statistical collections.

We were greatly assisted by the fact that we had received a significant increase in access to taxation data as a result of the introduction of a Goods and Services Tax (GST). This new tax was supported by a quarterly Business Activity Statement (BAS) for most businesses (monthly for the largest businesses). The number of items was relatively small but it contained the most important data items for supporting the quarterly national accounts. In effect, we had a quarterly census of businesses.

Second, there was extensive *consultation* with the different layers of management and the staff who were to be most affected by the changes. We started by having a small team

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developing strategic scenarios to achieve these outcomes for discussion by management. A preferred strategy was developed and discussed more generally with staff. These discussions were led by me and my most senior colleagues. Further changes were made as a result of those discussions. The fact that we made changes surprised staff somewhat and helped to develop strong buy-in from them and the staff unions. The importance of these consultations proved to be much greater than we anticipated. The union subsequently referred to our approach when discussing development projects with other government agencies.

Third, one of the biggest concerns expressed by staff during consultation was the need for *reskilling*. As a consequence, early attention was given to identifying the reskilling needs and an implementation strategy.

Fourth, the project had the very clear *support of executive management*. There were a small number of doubters and some effort was put into understanding the reasons for the doubts and what could be done to address them. In the end, there was 100% support for what was a major redevelopment project.

Fifth, early attention was given to *project management* (Trewin 2007). An external expert was used to provide advisory services throughout the project. A project management framework had been established and was used for this project. In particular, a lot of attention was given to the project governance arrangements. A project office was established to support the multiple project management committees and project teams.

Sixth, it was clear that significant *re-engineering* was required if the project objectives were to be achieved. Early attention was given to the nature of the changes so that organisational changes, reskilling requirements, and so on were understood. In particular, an early decision was made on the restructuring that was to be undertaken. This enabled us to take special steps to maintain business continuity whilst migrating to the new business structure. We looked for a mechanism that would ensure, as far as possible, that functions to be detached from existing collection areas were well defined, well understood and able to be managed as a distinct entity prior to transfer. This was done by creating “pods” working in the new way but located within the existing business units before the migration took place.

Seventh, a special feature of the project management arrangements was to identify the key *risks* and how they were managed. This was done for the overall program and individual projects. Possible business discontinuity was identified as the key risk, especially by the statistical managers. Special steps were taken to avoid this, including the podding described in the previous paragraph.

Eighth, *engagement with clients* of any new production system is crucial. In this case these were the managers and staff responsible for the new system. A lot of effort was put into consulting with these stakeholders prior to development and during the development period.

Ninth, there was a strong *focus on outcomes*, not just outputs. For example, we had past experience where systems had been developed in accordance with specifications but, for various reasons, could not be used by those who were intended to use them or did not perform effectively. That is, outputs were delivered but the desired outcomes of the systems redevelopment were not achieved. This particularly came into play when considering the training requirements, acceptance testing, documentation, and so forth to ensure the production systems were fit for use and could be used before they were formally installed.

Finally, we stayed with *proven technology* even though it was relatively new from the point of official statistical agencies. One of the core technologies used was input data

warehousing. The ABS' enterprise architecture was updated as a result of decisions on technology to be used for the new production systems.

2. The Production System Proposals

I will now look at the Statistics Netherlands (SN), RTI International (RTI), National Agriculture Statistical Service (NASS) and the Statistics New Zealand (SNZ) proposals for each of these ten criteria. The Westat/National Centre for Health Statistics (WESTAT/NCHS) proposal is considered separately because it is concerned with data access rather than data collection, processing and dissemination.

With respect to the *objectives* there was a strong focus on cost savings in all the proposals. This is not surprising, but I wonder if it means the other important objectives, especially over the longer term, are not getting sufficient attention in some of the proposals. In particular, is there enough focus on the dimensions of quality (e.g., accuracy, timeliness, coherence)? There are some exceptions. The SNZ proposal does provide a focus on a broad range of specified objectives, including supporting analysis capacity for SNZ statisticians, not just traditional processing functions. The SN proposal puts emphasis on flexibility to meet emerging user needs. The RTI and NASS proposals put a lot of emphasis on paradata as a means of improving the effectiveness of their survey operations.

Standardisation and integration were common objectives of all the proposals as a means of reducing cost, but this was being implemented with varying degrees of success. A range of different forms of standardisation are proposed – methods, concepts (classifications, definitions, etc.), processes, and supporting tools and systems. All are important. Standardisation of methods and concepts is important to the statistical integration increasingly desired by the users of these statistics, including the national accounts. The use of standard tools and systems, dependent to a large extent on standardisation of processes, is an important part of standardisation but it can be difficult to persuade some to move from a familiar system they have been using to a corporate standard, even if there is no loss in functionality.

With respect to *consultation*, employee ownership and involvement was only specifically discussed in the NASS proposal. It may have been considered in the other proposals but its non-mention suggests it may not be getting sufficient attention.

Reskilling is crucial to the success of production systems that involve major changes and got a mention in most of the proposals. For example, the SNZ proposal said that they would need to address the changing skills required by subject matter statisticians and the RTI proposal highlights the need to develop skills in using paradata effectively. A major change to production systems is more likely to be successful if the reskilling needs are identified early and plans to address these needs are made.

The clear *support of executive management* is essential for the success of major development projects. It can be difficult as their successful implementation often requires cultural change. The corporate benefits have to be understood even if some “local” inefficiencies are caused by using corporate systems in the short term. There will be resistance, but it may take significant effort to understand the reasons for the resistance and what needs to be done to convert the resisters. Often, it will be necessary to change personnel or their responsibilities, but this should be considered as a last resort.

The necessary support of executive management has not been obtained in all the production system proposals. The SNZ article recognises the need for corporate decisions on statistical development projects and the importance of cultural change but, at the time the articles were written, both the NASS and RTI proposals suggest there is some resistance that may not yet be resolved. In the NASS case, it says the Review Survey Estimates application has been delayed because maintenance of legacy systems has taken priority. In the RTI case, the statement that “Although RTI senior management has the expectation that each new survey project will adopt and implement Nirvana, the extent to which this happens – and reasons for doing so or not doing so – will be monitored” suggests the use of Nirvana will be non-mandatory, thereby reducing some of the corporate benefits.

The SN article says they have “not solved the standardisation challenge yet”. They have been considering this type of approach to their production systems for some time (an ICT Master Plan was developed in 2005) and I believe the main reason they have not progressed further, or achieved the necessary standardisation, was that there was not the necessary executive support for the proposals. This may be for good reasons; perhaps the proposal should be modified in some way to obtain the necessary support? There have been some recent positive signs. The authors say: “when the notion of architecture was first introduced, it was met with scepticism and its added value was questioned”. However, the authors now note that this scepticism has largely disappeared.

Project management, including project governance, is crucial but did not get detailed attention in some of the production system proposals. There is not sufficient space to provide a critique on each of the proposals, but the NASS article provides an excellent case study of good project management. Project management also got a lot of attention in the SNZ article. It is the SN proposal that concerns me most. Although multi-disciplinary teams will be used, the governance arrangements suggest there is a risk it may become an IT project rather than a statistical project enabled by IT. Certainly, using the CIO as Chair of the Central Portfolio Board rather than the “owner” of the production system being re-developed is unusual and is likely to lead to lack of ownership by the statistical areas.

However, some parts of the SN approach are worth considering in the design of major development projects. They used three different levels of project management which I support although, as mentioned above, I wonder whether the CIO should chair the Central Portfolio Board:

- managing the portfolio of redesign projects (chaired by the CIO).
- managing individual redesign projects (headed by statistical managers), and
- managing the enterprise architecture (chaired by the CIO but an Advisory Board to the Director-General).

The development projects being considered in this special issue are rather large. To make them more manageable, it is important to break them up into sub-projects, each with their own deliverables, milestones and budgets. This also makes it much easier to monitor progress and provides a sense of achievement when intermediate milestones have been reached. This can be important for large projects with rather extended timetables.

Re-engineering and restructuring will be crucial to obtaining the full benefits of the revised production systems, but are the staffing implications receiving enough attention?

Re-engineering can be difficult because it usually involves significant changes to staff responsibilities, but it is usually necessary to obtain the benefits of the new production system. Some re-engineering proposals are mentioned, such as the changes needed to effectively use paradata and introduce adaptive survey design (NASS and RTI); the need for greater integration of production systems (all proposals); easy to use standards, standard tools, and lower response burden through increased use of administrative data (SN and SNZ); and the need to move away from stovepipes and increase the use of administrative data (SNZ and SN).

Risk management is important to the success of any development project. Business discontinuity can be the most important risk with major redevelopments of production systems. Certainly, this was the risk that got most attention with the ABS' business statistics project. However, it did not receive much attention in any of the articles, although the NASS article recognised the importance of managing the transition to support business continuity and the RTI proposed a live field testing strategy. I have doubts about whether the bottom-up incremental approach proposed by SN to reduce risks is likely to be effective, as it will be difficult to maintain full corporate commitment to the redeveloped production system. This should not be taken as a criticism of pilot testing of the approach as an initial step. However, once the approach is proven the implementation strategy should encompass the transition of all the relevant production systems.

The clients for these four systems are the potential users of the system. They are the target audience when we talk about *engagement with clients*. It requires continual communication from the beginning to the end of the development. They need to be involved in the design of acceptance testing. The system cannot be considered complete until it has been signed off by the end users. These issues do not receive a lot of attention in the articles.

It is important to take account of the needs of the external users of the statistics derived from these production systems. However, this should not generally require a separate "user engagement" activity as their requirements should be known. The external users will require flexibility in the data inputs (e.g., inputs derived from questionnaires) to meet new and emerging needs. They will also have specific requirements in the way the outputs are delivered. The data input and dissemination components of production system have to be designed to allow this flexibility.

Similarly, a *focus on outcomes* rather than outputs did not receive much attention in the articles, although this does not mean this aspect was ignored. One exception was the NASS article, where the fact that "payment for services was not made to a contractor until the project manager was satisfied that the application was ready for production" clearly indicates an outcome focus.

Most of the articles suggest that *proven technology* will be used as the core technology for the production systems. This is explicitly mentioned in the NASS article. The SNZ article also suggests they will be making extensive use of off-the-shelf software. RTI carefully considered this approach but decided to develop their own systems without the use of off-the-shelf software. Even if proven technology is used, IT has to be managed to ensure standardisation occurs and is maintained. Indeed, as an example NASS mentions that issues have arisen because IT has not been well managed in the past. In fact, this might be a reason that some of changes they are making (centralised web servers) have not been

used previously, even though this technology has been used for well over a decade by my former organisation (with eight regional offices). Standardisation offers the potential for considerable savings in IT expenditures. The SN article explicitly discusses how they plan to introduce an enterprise architecture to enforce standardisation. No doubt an enterprise architecture is behind the other proposals although not explicitly stated as such.

3. Some General Questions

Discussants were provided with some questions that they might address as part of their comments. The answers to those questions which are relevant to my comments are set out below.

In your view, what are the biggest breakthroughs, or achievements, that have been made in redesign of the systems, as presented in the articles? Standardisation is a common motivation for all the redevelopment projects. As stated above, a range of different forms of standardisation are proposed – methods, concepts (classifications, definitions, etc.), processes, and supporting tools and systems. All are important. Although standardisation makes great common sense, it is not always easy to achieve as there is often considerable resistance because of the reluctance to move from current familiar methodologies or systems which work even if out of date. However, the corporate benefits from standardisation are considerable. These include reduced operational costs including training costs, reduced IT expenditure, greater consistency of approach across collections leading to improved statistical coherence, and greater flexibility in moving staff from one statistical product to another.

In your view, what are a few of the biggest mistakes, oversights, or shortcomings that system designers make in redesigning their systems? Without doubt, poor project governance is the most common cause of project failure even when the concept is great. Insufficient attention to risk management is often an important aspect of poor project governance. It is reassuring that for most of the production systems in this special issue, attention appears to have been given to project governance. The SNZ article provides some analysis of the lessons learnt from previous attempts to introduce a standardised approach. Two things mentioned were the inadequacy of the budget and trying to undertake the task in too short a time frame.

What role should survey methodologists play in the redesign of system architectures? Methodologists have very important roles, as I describe in the following sentences, but they should not have the project leadership role. That is the responsibility of the project owners, that is, those who will be using the new production systems in their day to day work. The methodologists may be the source of the innovation behind the production systems. They bring a broad perspective and can see the common elements across data collections more easily than those working on specific data collections. It is also part of their responsibility to keep abreast of developments that are happening elsewhere, including other countries. For these reasons, they should play an invaluable role in the exploratory and development phases (including risk analysis). Statistical methods can also play an important role in the design of survey modules and should be involved in this work. They should be represented on the Project Boards and Steering Committees as they can provide a different perspective to most of the others on these bodies.

Management (or governance) of development projects is crucial but it is not a well documented or understood practice. Governance of large-scale development projects needs to take into account the idiosyncrasies of the organization, but there may be important elements that are common to many organizations. Do the articles provide any evidence of these common elements and can you elaborate on what they are as well as their importance?

I do not agree that management of development projects is not a well documented practice. There is an extensive literature (see [Lock 2007](#); [Program Management Institute 2008](#); [Williams 2008](#)), although perhaps not for statistical development projects. However, many National Statistical Offices have dedicated training programs on project management. For example, the ABS has its own Project Management Framework based on standard project management approaches with complimentary training programs (see [Trewin 2007](#)). Perhaps it is more accurate to say that the special application of project management to statistical development projects is not well publicised in the statistical literature.

There is not a consistent interpretation of project management and project governance in the articles. In my remarks I have taken governance to be a (very important) component of project management. I believe this is consistent with the majority of the literature on project management.

4. The WESTAT/NCHS Article

I have commented separately on the article by Krenzke et al. because it deals with a completely different part of the production system, that is, external online access to microdata in a safe environment. Whilst this system is incredibly sophisticated, with very strong theoretical underpinnings, I have my concerns about whether it will be a successful development project. In my mind, it seems more complicated than necessary. The development cost will be extremely high and I wonder if it will be justified by the use. In fact, I think many of the users will be frustrated by the limitations on use:

- It is not clear how much consultation there has been with potential users of the system. Based on my experience in Australia, they will be disappointed with the limited number of functions that will be available to them.
- A risk avoidance rather than a risk management approach has been used. As a consequence, the system will be extremely complex and difficult to develop and maintain.
- The approach assumes users cannot be trusted. Should there be more reliance on legally enforceable undertakings? I am not clear what is allowed by the legal arrangements under which the National Centre of Health Statistics operates but, if there are provisions, it may be possible to simplify the requirements.
- Do users really give a high priority to accurate estimates of variance? I would have thought they would be more interested in increasing the analytical functions they can apply to the microdata.
- Remote access systems to microdata have been commonly used in many parts of the world for some time. There is no evidence that the strengths and weaknesses of these systems have been analysed and used to assist in the design of the WESTAT/NCHS system.

- Unlike the other production systems in this issue, little use of off-the-shelf software is proposed.
- The project governance arrangements are unclear. Without strong management, it would be very easy to lose control of such a complex project.

5. The Future of Statistical Production Systems

I believe the future will see a different form of cooperation between National Statistical Offices in the development of tools and methods for systems development. There has already been a lot of cooperation on methods through statistical conferences and/or bilateral and multilateral meetings. There has also been sharing of processing tools for production systems. The BLAISE system developed by Statistics Netherlands is a notable example.

The work taking place on process modeling and information modeling with the [Generic Statistical Business Process Model](#) (GSBPM) and Generic Statistical Information Model (GSIM), under the auspices of the Conference of European Statisticians, may underpin the future of Statistical Production Systems. It will support the application of common methods across statistical offices. It will support the development of common tools based on this model. This can be particularly important for developing countries. The licensing costs of commercial statistical software packages can be out of the range of many developing countries. The availability of tools at the relatively low cost based on a relevant GSBPM/GSIM will be a real bonus to them. However, there are too many idiosyncrasies in the requirements of individual countries to expect this work to lead to common systems.

These tools are likely to facilitate and depend upon the life cycle management of data and metadata. They are likely to be part of an agreed enterprise architecture. This will only work if there are effective governance arrangements for IT and statistical information management.

Finally, I would like to congratulate all the authors on excellent contributions to this very important topic for statistical agencies.

6. References

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