At the cusp of change – strategies, progress and challenges in modernising a National Statistical Office

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1. Introduction

Modernisation is essential for National Statistics Organisations (NSOs) to survive and thrive in the changing world of official statistics. Over decades, the Australian Bureau of Statistics (ABS) has successfully modernised different aspects of its operation, as circumstances have required and resources have been available. However, rapid and profound changes in the information environment, new client expectations and increasing budget pressures have emerged over the past 4 four years and the ABS has recognised the need for a different path to modernisation.

Over the last four years, the organisation has commenced implementing a range of strategies for modernisation. These include developing a clear vision and plans, fostering effective international collaboration, committing to standards, investing in foundation infrastructure, and engaging with key stakeholders and partners. To mitigate risk for the largest transformation in the history of the ABS, the ABS has gained early experience in modernising our metadata repositories and e-form capability and strengthening multidisciplinary capabilities.

This paper describes these strategies; explores the achievements, challenges, progress and learning experienced to date; and outlines the further steps needed to ensure a successful modernisation effort.

2. Clear Vision and Plans

The ABS operates in an increasingly complex environment. Like many National Statistical organisations, the ABS is facing many challenges including limited funding, full work programs, aging infrastructure and a rapidly changing information industry.

The ABS modernisation program was established as a major change program to sustain the ABS into the future. The program has a clear vision and plans which will help the ABS:
- establish more robust infrastructure to manage statistical risk and ensure that decision makers can continue to trust our national statistics;
- become more innovative to ensure that the ABS both thrives in and survives the ever tightening fiscal conditions;
- become more responsive in the creation of new statistical solutions through metadata driven business processes; and
- enhance its value as a partner in government information provision while reducing red tape.

The program aims to take a wholistic approach to transform the way the ABS undertakes its business. This includes how the ABS collects, collates, manages, uses, reuses and disseminates statistical information.

Some of the key areas for modernisation include:
- Organisation wide information management – where the information is owned by the organisation and not by individual areas;
- Increasing the use of existing data, held by us or by others, rather than increasing the use of surveys;
- Collecting data in ways that are less intrusive, less costly and more convenient for households and businesses;
- Placing the ABS as part of an interconnected information sector, in partnership with other information producers and users;
- Providing avenues for more complex data analysis to help address difficult policy problems; for example by providing enhanced capabilities for data integration, significantly improved access to micro data and automated machine to machine access to our data.

3. Effective collaboration and engagement

The ABS recognised that the organisation could not successfully modernise alone. Such a large organisational change requires significant partnership, investment and support from our government and key stakeholders. We had to develop our ability to effectively partner with central agencies and key clients; creating a shared view of the required future state of official statistics in Australia and the means to get there.

We have also collaborated internationally and in some cases led work to industrialise the global business of official statistics. Official Statistics organisations have long collaborated on standards and frameworks, under the guidance of the United Nations and other international organisations. Despite this, many NSOs have developed their own processes, sytems and information models to implement these frameworks. As a group, the Official Statistics organisations have recognised that this approach is not sustainable. Over the past 5 years, some significant new standards have been developed with the support of the United Nations Economic Commission for Europe and the High Level Group for the Modernisation of Statistical Production and Services [i] to facilitate sharing of systems across statistical organisations. These include a Generic Statistical Business Process Model (GSBPM), a Generic Statistical Information Model (GSIM), a Common Statistical Production (CSPA) and a Generic Activity Model for Statistical Organisations (GAMSO). [ii] This work has been rapidly accelerated through the use of International Sprints which draw together international experts to intensively develop outputs. [iii]

These standards, and the growing commitment of official statistics organisations to them, have the potential to drive stronger, more coherent, partnerships with both the information and the technology industries. Shared requirements embodied in the standards and related work will support these industries to innovate and compete in the knowledge that their products will integrate effectively with many official statistics organisations' systems. Over time, we expect that more of the infrastructure needed for official statistics will be available commercially, just as has happened in other industries.

4. The approach

To achieve successful modernisation, the program has been designed with five key components:
- building **foundation infrastructure**;
- challenging our business outcomes and understanding our requirements – **reengineering design**;

- creating a modularised business environment which integrates with the foundation infrastructure by establishing **enterprise wide capabilities**;
- rolling out statistical activities onto the new environment – **configuring and onboarding**; and
- using **enabling activities**, such as program management and resource management.

Foundation Infrastructure

Foundation infrastructure, based on the international standards, will provide a coherent and integrated environment for the use and life cycle management of our data, metadata and processes. The infrastructure includes metadata models, a metadata registry and repository, a metadata driven workflow management system and an integrated data management environment. It will enable the ABS to transform the way business is undertaken to a metadata driven and automated future:
- reducing errors caused by the manual handing of data and processes,
- reducing the time and cost of running a new collection,
- increasing coherence and quality of data and metadata,
- decreasing cost of developing or integrating new systems, and
- decreasing the cost of training staff.

The ABS is implementing a GSIM based logical and physical information model within the metadata registry and repository in advance of reengineering our business processes. Initial work to develop a comprehensive set of attributes for each object progressed too slowly due to the lack of detailed requirements and rework of completed objects as new requirements emerged. A more agile approach has now been adopted - with all objects being implemented with a minimum set of attributes. These attributes will be rapidly augmented to support requirements identified through reengineering.

Reengineering Design

The transformation must be business driven to deliver on the organisation's expectations. To achieve this the ABS has developed business strategies for transforming people statistics and economic statistics. These describe the expected future operating model which aims to produce data on the economic and social conditions of Australians more frequently and in a more timely manner using existing data sources, data integration and integrated collection.

All ABS statistical business processes will need to be reengineered: requirements gathered, services bought, built, or wrapped and business processes integrated with the new foundational infrastructure. Moving the ABS from its current state to a more automated, agile operating environment will require compromise and clear decision making. The changes must lead to a more efficient organisation and trade-offs will be required; the best organisational outcome may lead to sub-optimal outcomes for individual business areas. To overcome this the ABS needs strong governance and strong partnership between the different parts of the organisation.

A key part of achieving the best organisational outcome has been to develop an Enterprise Architecture and principles in strong partnership with business areas and utilising the international standards described above (See Figure 1).
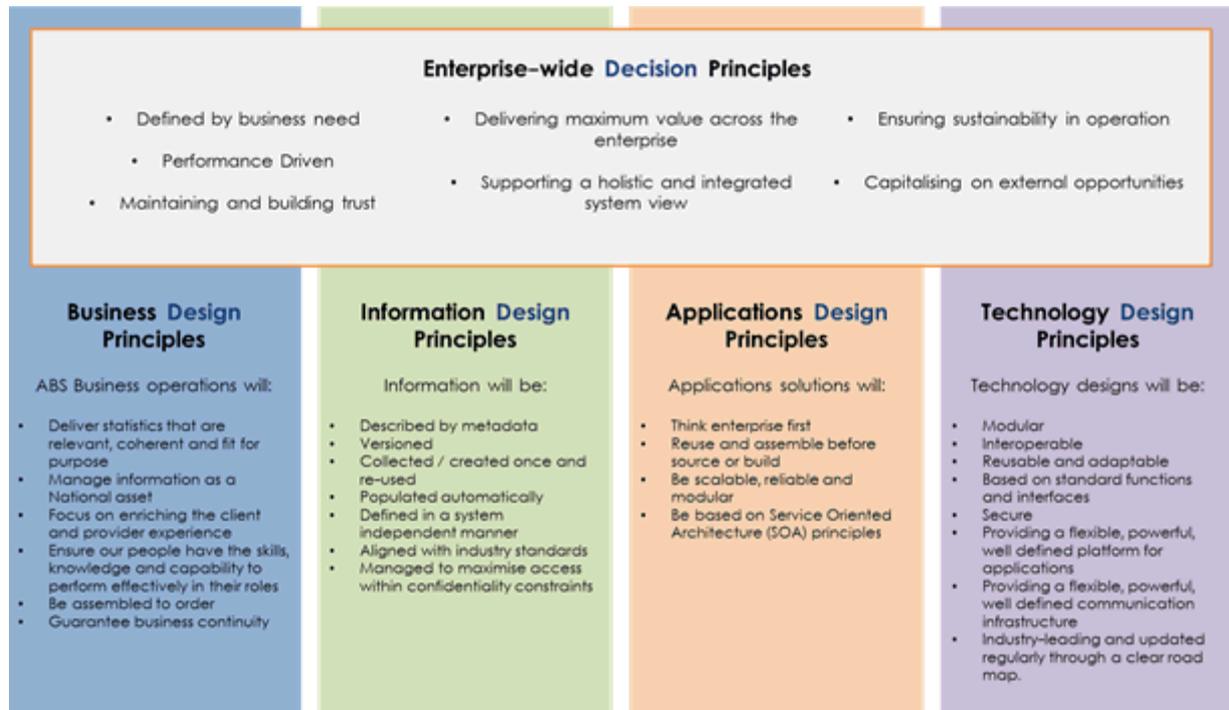
Enterprise-wide Decision Principles

- Defined by business need
- Performance Driven
- Maintaining and building trust
- Delivering maximum value across the enterprise
- Supporting a holistic and integrated system view
- Ensuring sustainability in operation
- Capitalising on external opportunities

Business Design Principles

ABS Business operations will:

- Deliver statistics that are relevant, coherent and fit for purpose
- Manage information as a National asset
- Focus on enriching the client and provider experience
- Ensure our people have the skills, knowledge and capability to perform effectively in their roles
- Be assembled to order
- Guarantee business continuity

Information Design Principles

Information will be:

- Described by metadata
- Versioned
- Collected / created once and re-used
- Populated automatically
- Defined in a system independent manner
- Aligned with industry standards
- Managed to maximise access within confidentiality constraints

Applications Design Principles

Applications solutions will:

- Think enterprise first
- Reuse and assemble before source or build
- Be scalable, reliable and modular
- Be based on Service Oriented Architecture (SOA) principles

Technology Design Principles

Technology designs will be:

- Modular
- Interoperable
- Reusable and adaptable
- Based on standard functions and interfaces
- Secure
- Providing a flexible, powerful, well defined platform for applications
- Providing a flexible, powerful, well defined communication infrastructure
- Industry-leading and updated regularly through a clear road map.

Figure 1. Enterprise Architecture Decision and Design Principles

Enterprise Wide Capabilities

Another important part of the Enterprise Architecture is a Capability Reference Model. (See related paper iv). The ABS capability reference model identifies a set of high level enterprise capabilities designed to be discrete and reusable across business activities. Each of these will be delivered through a specific project with agreed requirements and clear project management, plans and accountability. These capabilities are:

- Statistical Information Data Management
- Statistical Information Metadata Management
- Statistical Process and Workflow Management (Design and Configure)
- Statistical Process and Workflow Management (Process and Workflow Control)
- Statistical Solutions Development
- Statistical Information (Real World Intelligence)
- Data Acquisition
- Dissemination
- Statistical Quality Management
- Stakeholder Management
- Data Compilation – Coding
- Data Compilation – Derivations
- Data Compilation – Output Adjustment
- Data Analysis
- Statistical Data Validation
- Statistical Data Linking
- Confidentialisation
- Output Estimation
- Register, Frame and Sample Management

We have gained early experience with developing the Data Acquisition enterprise capability, in recognition of the significant cost and convenience benefits from modernising our interaction with providers. We have successfully implemented first versions of electronic survey forms for most ABS business surveys and the Monthly Population survey with impressive take up rates by business of around 90% and households around 20%. The project had an ambitious timeframe and some difficult risks to manage. Lessons were learnt about the need to separate business delivery activities clearly from transformation activities, the need for clear separation of new technologies from legacy applications, the importance of streamlining instrument development, and the critical requirement to build and maintain effective working relationships throughout the change.

Configuration and on-boarding

The ABS has recognised that an important part of success will be comprehensive adoption of the new capabilities in a way that appropriately manages risk. Planning is underway to ensure statistical impact and risk is minimised, legacy systems are decommissioned, staff are effectively trained and the program's outcomes are achieved.

Managing statistical risk before, during and after transformation is one of the most significant challenges, with the potential to cause reputational damage and diminished trust in our statistics if not managed well. The organisation's methodology and ICT departments are strong partners in the process of developing clear and agreed strategies with business areas to mitigate this risk.

Enabling activities

The ABS has a range of highly skilled and knowledgable staff members but does not have all of the skilled resources required. In preparation for the transformation the ABS has employed people with specific expertise and experience in organisational transformations. For example, the Senior Responsible Officer – the head of the program - and a number of people in the Program Office have experience in running successful enterprise wide modernisation programs in other large organisations and have brought a new rigour and robustness to the ABS approaches in program and project management, risk management, resource management and reengineering. Recognising the complexities of the program, we have implemented a governance structure based on Managing Successful Programmes [v]. This governance has already proven effective in guiding the development of the program.

Another challenge is to have skilled people with good knowledge of the business available to assist with the transformation, whilst ensuring that the normal business delivery of the organisation is not compromised. A critical principle is that there should be clear separation of business delivery from the transformation so that neither impacts negatively on the other. The ABS is using Multi-disciplinary Teams (MDT's) to help ensure projects are assigned appropriate resourcing. MDTs will typically consist of a group of individuals who work across time, space and organizational boundaries, with assignments, effort and delivery actively assigned and tracked. MDTs will change in size, make-up and focus as a project advances through its project phases.

A further challenge is to use the resources available in the wider environment effectively, including partnering with commercial and other government organisations and sourcing components externally wherever possible. The program has also developed stronger skills in sourcing in recognition of the need to move from building our own systems to procuring off the shelf solutions where possible and aligning internationally to create a stronger market for ICT systems for official statistics.

5. Further steps

As outlined above, the ABS has made comprehensive plans for a rigourous and professional approach to modernisation. To achieve the aspirations of the change program, the ABS will require all project teams working within the transformation to embrace and support the governance approaches, design principles and standards we have chosen and developed and to take heed of the lessons learnt from early work on the foundation infrastructure and the Data Acquisition enterprise capability.

This significant organisational change will require clear and effective communications, cultural change and strong collaboration with staff, our partners and stakeholders. For example, we need staff across the organisation to learn and speak the international language of statistics (such as GSIM) rather than using local terms to ensure we can harmonise our business processes.

The transformation program is an outstanding opportunity to draw in external stakeholders to work with us to modernise our organisation and its services. Through ongoing external engagement, we will collaboratively manage the risks for stakeholders and build long term sustainable partnerships.

The ABS will continue to work with the official statistics community to realise the benefits of aligning our architectures. We will be working with particular National Statistics Offices to develop common requirement specifications for CSPA compliant services with the aim of developing a vibrant market for statistical cababilities.

These steps will help to ensure the longer term sustainability of the ABS and its forward work program by automating manual processes, reducing duplication, streamlining key activities, standardising work practices to facilitate better distribution of the workload across the organisation, and rationalising system applications and infrastructure.

6. References

[i] http://www.unece.org/statistics/about-us/statstos/high-level-group-for-the-modernisation-of-statistical-production-and-services.html

[ii] http://www1.unece.org/stat/platform/display/VSH/Virtual+Standards+Helpdesk

[iii] http://www.statistics.gov.hk/wsc/STS048-P1-A.pdf

[iv] STS 071 Modernisation strategies in the Australian Bureau of Statistics (ABS) –
An Enterprise view of the future, Sebastian Dubrovsky, Jenine Borowik, Australian Bureau of Statistics, Canberra, Australia

[v] http://www.managing-successful-programmes.com/msp-introduction.asp