

Business Registers Expert Group

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Session 2: The Role of the SBR in the Modernisation of the Statistical Production Process

ABS Registers Transformation Program

Introduction

In 2015, the Australian Bureau of Statistics (ABS) commenced a corporate program to transform the way ABS collects, manages, and delivers information and statistics to its end users. The goal of the Statistical Business Transformation Program is to redesign the ABS's statistical information management processes to ensure a sustainable model for the future. As part of this program the ABS Business Register is being redeveloped to make effective use of the new corporate infrastructure, including an enterprise data management warehouse and a metadata registry and repository. The redevelopment of the ABS Business Register will also enable a new approach to producing frames and linking and integrating datasets. The first section of this paper provides an overview of the ABS Statistical Business Transformation Program, including the key corporate infrastructure it will establish. The second section provides an overview of the ABS Business Register Conceptual Framework, while the third section discusses the registers re-engineering program and progress to date, noting the new ABS Business Register is currently scheduled to be used in production at the end of 2018. The final section of this paper outlines the broad ABS Business Register re-engineering approach, including the use of agile methods.

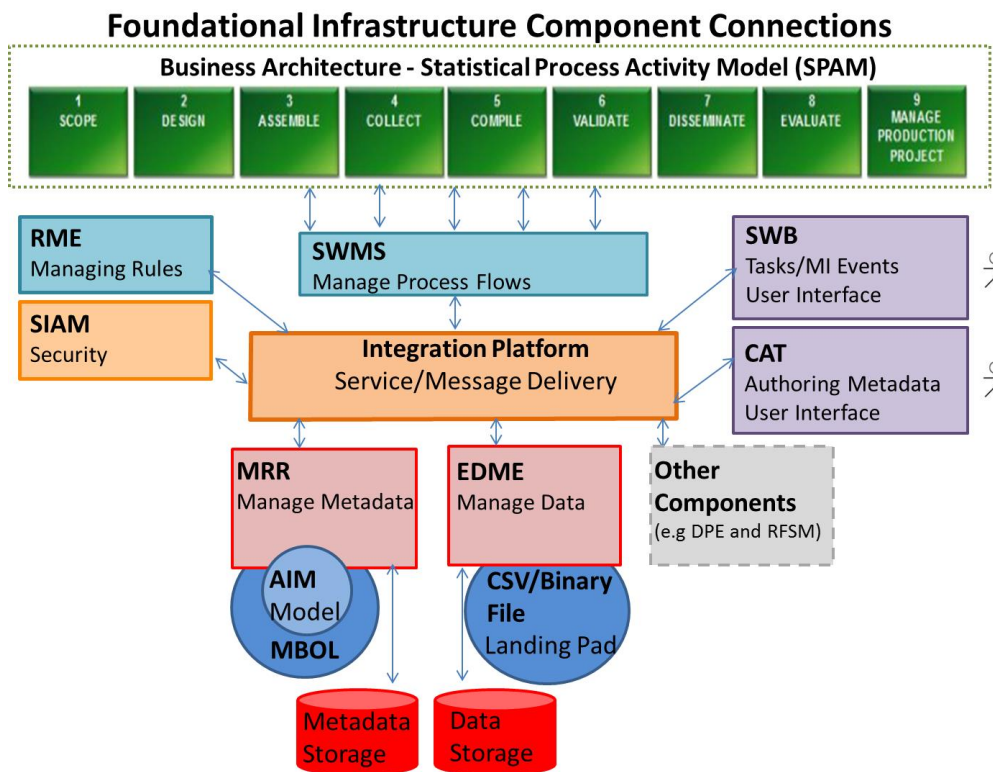
ABS Transformation Program

1. The high level goals of the ABS Statistical Business Transformation Program are reduced cost, reduced statistical risk, reduced time to market, reduced red tape and growing the business, with the first two goals being the highest priorities. The outcomes that the ABS is seeking to achieve from the transformation program are:
 - greater use of administrative and transactions data, including supporting micro-data linking in the process of compiling statistics;
 - more time is spent by staff on high level quality assurance, analysis and explanation, and working with key users to deliver the information component of solutions to their challenges;
 - the turn-around time for new statistics is reduced;
 - users have a greater capacity to assemble their own statistical answers from the data resources available from the ABS.
2. The Statistical Business Transformation Program includes:
 - The development of new Foundational Infrastructure in order to support an enterprise wide approach to the management of statistical information and business processes. Each component of this infrastructure will help the ABS to transform the way statistical metadata,

data and processes are managed. The Foundational Infrastructure components are: ABS Information Model (AIM); Common Authoring Tool (CAT); Enterprise Data Management Environment (EDME); Integration Platform (IP); Metadata Registry and Repository (MRR); Rules Management Environment (RME); Security and Identity & Access Management (SIAM); Statisticians Workbench (SWB); and the Statistical Workflow Management System (SWMS). Figure 1 outlines the relationship between these components. Appendix 1 provides a description of each component.

- The development of enterprise wide services that are critical to the statistical production cycle, including provider management; registers, frames and sample management; data editing; coding; data validation; confidentialisation; and dissemination. Appendix 2 provides a more complete summary of the enterprise wide services.
- Each enterprise wide service has six dimensions that need to be supported. These are people; methods; information; systems; processes; and other supporting resources such as non ICT assets and infrastructure.
- All processes are being re-engineered based on future state Business Process Maps. These are based on the Statistical Production Activity Model (SPAM), which is the ABS version of the Generic Statistical Business Process Model (GSBPM).

Figure 1: Foundational Infrastructure Component Connections



3. The key features of the Statistical Business Transformation Program from a registers perspective are:
 - All data will be stored in the Enterprise Data Management Environment (EDME) which is an Oracle datastore. The EDME will become the ABS “data lake”.
 - All processes in the new environment will be metadata driven. All metadata relevant to statistical production will be stored in the corporate Metadata Registry and Repository (MRR).

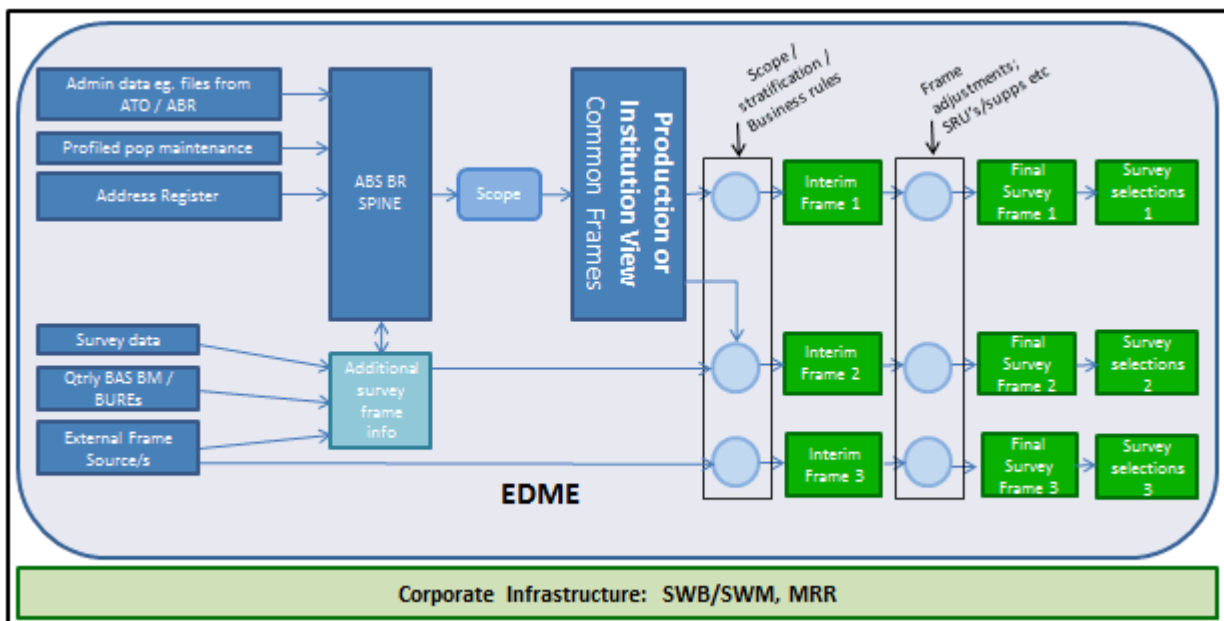
- Statistical processing will be managed via a user interface called the Statistician's Workbench (SWB).
4. To complement the Statistical Business Transformation Program, a review focusing on the transformation of the ABS Economics Statistics Program was also conducted. This review identified an expanded and outwardly focussed Business Register as a key priority for the ABS.

ABS Business Register Conceptual Framework

5. The scope of the ABS Business Register is all legal entities undertaking productive activity in Australia's economic territory. The information on the ABS Business Register is primarily sourced from the Australian Business Register (maintained by the Australian Tax Office), other data kept by the Australian Tax Office and via ABS profiling of large and/or complex businesses. The ABS uses an Economic Units Model to describe the structure of businesses on the ABS Business Register. More information on the Economic Units Model can be found in Appendix 3.
6. Historically in the ABS, the key use of the ABS Business Register has been to (a) produce survey frames and support statistical processing, and (b) produce business demography. The vision of an expanded and outwardly focused ABS Business Register has the following additional goals: (c) becoming a spine to integrate data; (d) hosting the infrastructure for small area statistics; and (e) becoming an output in its own right through increasing the ABS Business Register accessibility.
7. Registers in the ABS transformed environment, including the ABS' Address Register, will no longer be held in a single structured database. Rather, they will be created virtually, using data linking. Statistical registers for use by the ABS will in essence be an environment that encompasses core or 'spine' data, along with the capabilities to link to various datasets. These linkable datasets will include datasets that can link back to the spine, the attributes and activities of statistical units, the 'reasoners' (rules engine) or logic that enable derivations and transformations to support further linking, plus the ability for standard and ad hoc views and outputs (eg. survey frames, tables) to be created. The supporting environment will be sufficiently flexible to enable new datasets to be related to the spine as they are created or obtained.
8. The spine to support broader data linking will contain the comprehensive and exhaustive list of in-scope businesses using the Legal Entity. The Legal Entity has been chosen as the primary unit to support data linking as they are generally required to be registered with either the Australian Business Register (administered by the Australian Taxation office) and / or the Australian Securities and Investment Commission (ASIC). The spine will include identifiers (or linkage keys) that will facilitate unit level linkages to a wide range of statistical and administrative based economic unit record data on the EDME. This approach will enable the ABS to integrate datasets to support a broader range of data analysis and better place ABS to help inform policy debates.
9. To support coherence within ABS data, in the future all economic collections will either source their frames from the ABS Business Register or be linked to the ABS Business Register. This will be achieved via the following approaches:
 - Two Common Frames:
 - A production based Common Frame for collections that use the production unit (TAU).
 - An Institutional Sector Common Frame to support the International Investment and Financial Statistics collections which survey at the institutional level.
 - Collections will fall into three categories (see Figure 2):
 - Common Frame collections – Collections whose requirements are fully met by the Common Frame (Frame 1).

- Common Frame Enhanced collections – Collections which require other subject matter specific sources in addition to the Common Frame. An example is the International Trade in Services collection where an activity flag is used (Frame 2).
 - Non-Common Frame collections – Collections which require the use of an alternate unit. Hard or soft linking will be used where possible to link to the ABS Business Register. An example is the Government Finance Statistics collection which uses administrative data based on units available from Government accounting systems. (Frame 3).
10. Working within current infrastructure it has been challenging to derive an institutional sector view of the Australian economy using the ABS Business Register. To address this, the Institutional Sector Common Frame is being developed to enable stronger coherence between the International Investment and Financial Statistics collections. The Institutional Sector Unit will be a synthesised unit that will allow the ABS to provide an institutional view of the economy. It will also facilitate mappings between institutional and production units. It will be derived from the grouping of Legal Entities with the same institutional sector class within the Enterprise Group. It will be sourced from the ABS Business Register, but supplemented with additional administrative data. The ABS is currently investigating data sources from the Australian Prudential Regulatory Authority (APRA), the Australian Securities and Investment Commission (ASIC), and the Australian Taxation Office (ATO) for use in producing the Institutional Sector Common Frame.
11. To implement the Institutional Sector Common Frame a significant matching exercise for sector data is being undertaken between the Business Register Unit and the International Investment, Financial Statistics and National Accounts sections. Profiling practices are also being reviewed to ensure the institutional sector view is better accommodated and units re-profiled where appropriate.

Figure 2: Survey Frames Processing Map



12. To maintain the ABS Business Register in a transformed environment a number of other changes are also being explored. These include:
- Reviewing the profiling program to investigate a reduction in the annual profiling selections, offset by a more targeted approach using improved triggers to commence profiling activity. This will involve having a greater focus on profiling large businesses when a real world

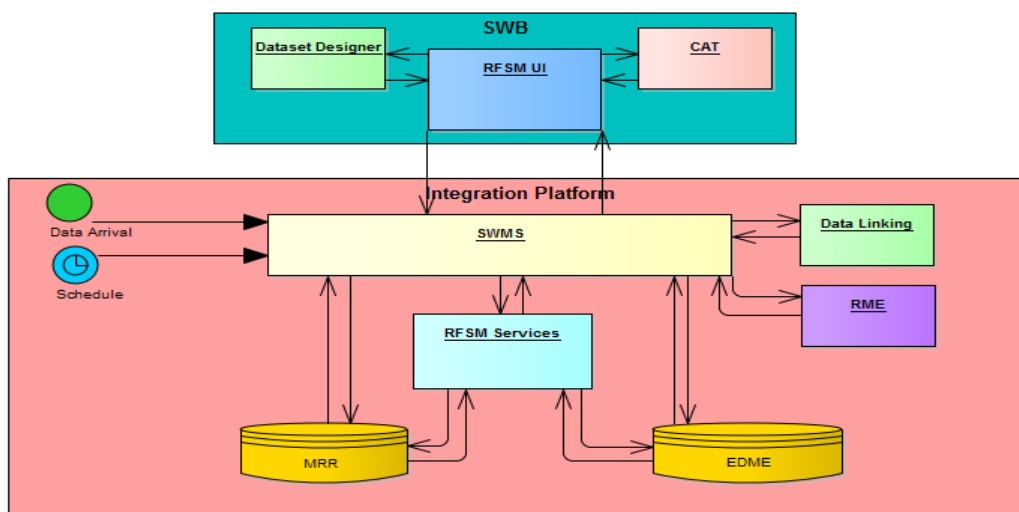
change is identified. Different approaches to the functional placement of profiling activity within the ABS are also being tested, including testing profiling being undertaken by the data acquisition and editing functions.

- Exploring the utility of additional administrative data sources to allow for more comprehensive coverage of the ABS Business Register.
- Exploring options to improve location coverage on the ABS Business Register.
- Development of a profiling web based form (with smart edits).
- Development of a cloud based API point of contact industry coder that will be available to external users for industry coding.

ABS Business Register Re-engineering Program

13. In the future there will be a single registers capability known as “Registers, Frames and Sample Management (RFSM)” services. This will be used to manage the ABS Business Register, ABS Address Register and any future registers developed by the ABS. This capability will rely on the use of ABS Foundational Infrastructure and other enterprise wide services.
14. Through the application of Foundational Infrastructure (see Figure 3) and re-engineered business processes, the RFSM solution will deliver a single generic environment that will allow users to design, edit and maintain statistical registers, survey frames and samples through the configuration of business services and workflows. These services will include data linking, validations, rules management (business rules, algorithms), auxiliary variables, data visualisation, metadata authoring, and management information. RFSM processes will be called through a user interface that is accessed from the Statistical Workbench (SWB).
15. RFSM services will use metadata driven processes to store and manage data, as well as managing access. This will result in efficiencies and improve the integration with the rest of the statistical production process. By using the RFSM services, ABS registers staff will be able to:
 - Maintain unit level data, through profiling and administrative data updates;
 - Create and manage frames and samples using standard interfaces that involve fewer steps and less manual intervention, and use a single source of truth;
 - Ensure data and metadata definitions and business rules are standardized, via user configuration in the Metadata Registry and Repository (MRR) for re-use;
 - Use registers as an enabler for data integration, in addition to producing frames and samples.

Figure 3: RFSM Integration



16. It is expected that the transformed ABS Business Register will be used for the first time in production for the December 2018 Common Frame. To achieve this timeframe:
- Historical data will be transferred to the EDME in late 2017
 - Data on the ABS Business Register will be remediated to align with the future state model during 2017.
 - The fully functional Registers, Frames and Sample Management capability will be available in March 2018.
 - Metadata definition and future state business rules will be progressively developed and implemented through to mid-2018.
 - Testing of the integrated capabilities, including the ABS registers maintenance (eg. updates via profiling and administrative data) and outputs functionality will be conducted through to October 2018.

ABS Registers Re-engineering approach

17. The ABS Statistical Business Transformation Program is extensive and complex. ABS has identified eight components critical to the successful implementation. These are:
- Business process re-engineering: the analysis and redesign of statistical business workflows to optimise and standardise end-to-end processes and automate non-value added tasks.
 - Data and metadata migration: the migration of existing data and metadata to the new corporate repositories.
 - Testing and business acceptance: business acceptance and end to end testing ensures that the capabilities and processes are fit for purpose, fit for use and meet key business requirements.
 - Change management: preparing staff and coaching managers to lead and support teams through the transition to the new infrastructure and maximise the adoption of the new capabilities and processes.
 - Training: ensuring that staff are trained and equipped to use and maintain the new capabilities and processes.
 - Onboarding: ensuring there is an effective process to support the adoption of the new capabilities and processes and their use in statistical production for the first time.
 - Transition statistical risk management: ensuring that risks introduced or heightened by the transition to new capabilities and processes are identified and that impacts to statistics can be measured and controlled.
 - Decommissioning: the decommissioning of legacy systems when those systems are no longer required. There will be a period where dual ABS Business Register environments will need to be managed.
18. The ABS Business Register re-development has been managed via:
- The establishment of a Transforming Statistics team to work on the future ABS economics statistics strategy. This included developing the future conceptual model for the ABS Business Register and how registers will be used by the ABS in the future. This work of this team has now been completed.
 - The establishment of a project team responsible for developing the RFSM systems functionality under the broader Statistical Business Transformation Program. This team has been supported by the activities undertaken by the Transforming Statistics team and the Business and Address Register teams.

- A multi-disciplinary working group is charged with overseeing the transition from the use of the old to new systems, including members from the RFSM team, the Business and Address Register teams, and the ABS Transitioning Statistics deployment teams and program management.
- The use of agile methodologies to ensure a minimal viable product is delivered. The RFSM project team are employing a scrum approach to product development. Product descriptions for registers, frames and sample management functionality have been developed by the product owner outlining the quality acceptance criteria to achieve the benefits and met the register team's expectations. Project sprints, each three weeks in duration, have been aligned with a view to delivering complete capabilities that meet features, quality and timing requirements for business on-boarding. Within the sprints tasks are prioritised and outstanding issues are held in a backlog of issues.
- ABS is developing business scenarios to ensure the integration of the Foundational Infrastructure and enterprise wide services are co-ordinated and effective. This exercise will also influence resource allocation and product prioritisation across the Statistical Business Transformation Program.

19. The key challenges associated with ABS Business Register re-engineering are:

- Managing core business during the transition to the use of the new systems, including the management of dual ABS Business Register environments until the legacy system can be decommissioned.
- Unpacking and understanding the current legacy system in order to manage the statistical risk associated with the change.
- Registers do not fit neatly within the SPAM / GSBPM as they are viewed as inputs to the broader statistical process. In the future-state business process maps the register functions are spread across a range of high level activities such as scope (user requirements for a frame or extract), design (scope and concepts of registers and frames, maintenance triggers), collect (generate frames), and validate (external data requests), rather than being their own activity within the presentation.
- Dependencies on the development and build of ABS Foundational Infrastructure and enterprise wide capabilities occurring in parallel to the development of the RFSM services.
- The first collections to onboard to transformed ABS infrastructure will do so prior to the RFSM capability being available for use. Frame outputs using the legacy process will need to be produced in a format that can feed into the new infrastructure for the early adopter collections.

20. The ABS Business Register redevelopment is critical to the future of the ABS economic statistics strategy where there will be a greater focus on the integration of data to enable statistical solutions to be delivered. Progress in order to achieve this goal will be shared at future Business Register meetings.

Appendix 1: Description of ABS Foundational Infrastructure Components

ABS Information Model (AIM): Contains a collection of metadata that represents core components of ABS statistical activities from collection through to dissemination. Its purpose is to identify the components of statistical activities that are important to the ABS and to provide a logical model for information systems within ABS business areas. The AIM describes the sorts of data an information system will contain, and how it will be organized, before the information system is built. The AIM provides a standardized, shared understanding of the key components of ABS statistical activities, and how the metadata should be associated with them.

Common Authoring Tool (CAT): Accesses the MRR to discover, view, create, register and update metadata. CAT uses the Metadata Business Object Library (MBOL), which provides a library of AIM aligned templates to generate the interface.

Enterprise Data Management Environment (EDME): Will provide an integrated data management environment for structured and unstructured data. It will provide a single logical repository to enable the ABS to manage data across all aspects of a statistical cycle.

Integration Platform (IP): A middleware software designed to enable communication between applications and systems. The IP allows applications and systems to access different infrastructure capabilities in a standardized manner and enables end-to-end application communication, negotiating any differences in the way applications operate.

Metadata Registry and Repository (MRR): A centralized catalogue, register and store for statistical metadata. The MRR registers and stores metadata that defines the ABS' statistical data, statistical programs and enables users to discover, view, create, register, store, update and govern metadata.

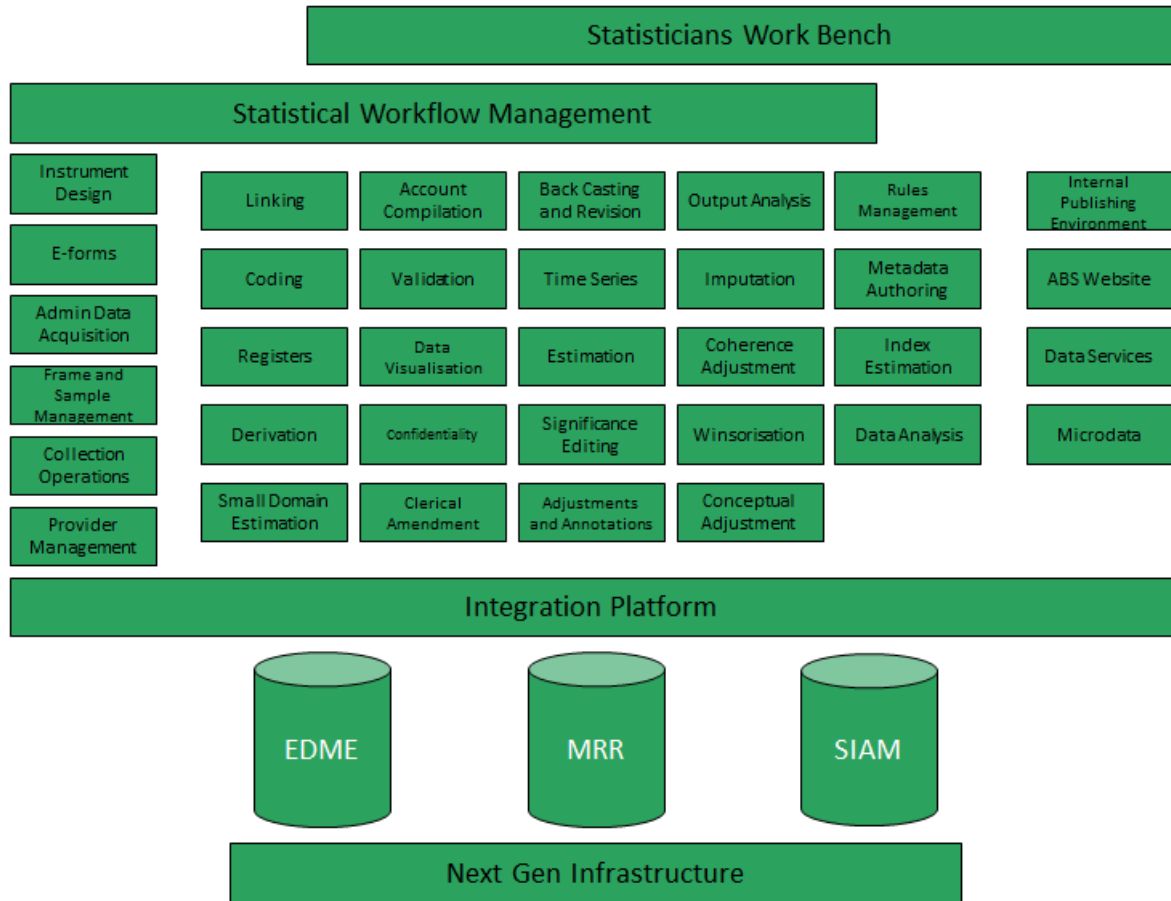
Rules Management Environment (RME): Gives business users the ability to discover, view, create, register, validate, derive and update business rules for their processes. RME utilises the Common Authoring Tool (CAT) as the interface to allow business users to perform these functions.

Security and Access Management (SIAM): Will provide access management services supporting the delivery of business systems. SIAM includes Role and Access Management, execution of Authorisation Queries and an Access Framework to provide guidance on access management and best practice.

Statistician's Workbench (SWB): Provides the main user interface for staff, enabling the management of statistical tasks, viewing of processes and access to other web tools. The SWB is a web portal.

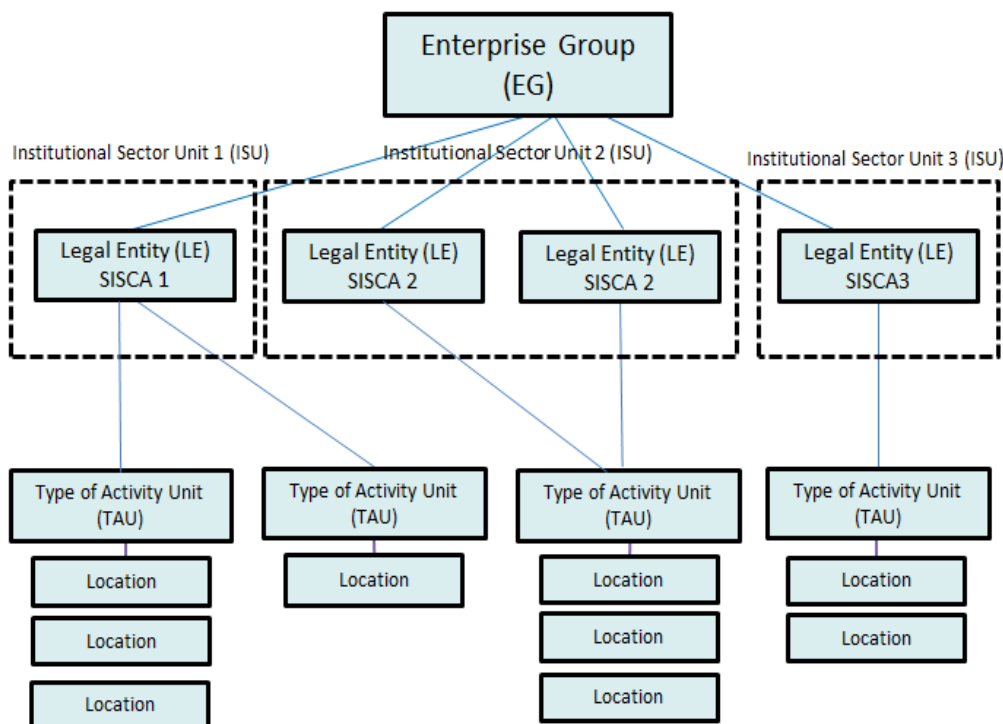
Statistical Workflow Management System (SWMS): Is a central corporate facility which will document then automate business processes. SWMS utilizes ActiveVos, an off the shelf Orchestration System which enables the development and subsequently stores, business processes in a consistent and standardized way. Some information about the process is registered in the Metadata Registry and Repository (MRR) to enable the discovery of processes and create links between the metadata (in the MRR) and data (in the Enterprise Data Management Environment), which are used to drive the business process.

Appendix 2: ABS Enterprise Wide Services



Appendix 3 – ABS Economic Units Model

The ABS Economic Units Model that is used to determine the structure of businesses is consistent with Australia’s Corporations Law and with the definition of institutional units outlined in 2008 System of National Accounts (SNA). The model consists of: the Enterprise Group (EG), one or more Legal Entities (LE), one or more Type of Activity units (TAU), and one or more locations.



Note: the presentation of the ISU in this diagram has not been finalised but is indicative.

The **Enterprise Group (EG)** is an institutional unit covering all the operations within Australia's economic territory of legal entities under common control. Control is defined in Corporations legislation. Majority ownership is not required for control to be exercised.

The **Legal Entity (LE)** statistical unit is defined as a unit covering all the operations in Australia of an entity which possesses some or all of the rights and obligations of individual persons or corporations, or which behaves as such in respect of those matters of concern for economic statistics. Examples of legal entities include companies, partnerships, trusts, sole (business) proprietorships, government departments and statutory authorities. Legal entities are institutional units.

The **Institutional Sector Unit (ISU)** is a derived statistical unit. It includes all legal entities within an Enterprise Group that are classified to the same institutional sector class.

The **Type of Activity Unit (TAU)** is a producing unit comprising one or more legal entities, sub-entities or branches of a legal entity that can report productive and employment activities via a minimum set of data items.

A **Location** is a single, unbroken physical area, occupied by an organisation, at which or from which, the organisation is engaged in productive activity on a relatively permanent basis, or at which the organisation is undertaking capital expenditure with the intention of commencing productive activity on a relatively permanent basis at some time in the future.