



# SIF

## IMPLEMENTATION SPECIFICATION AUSTRALIA

→ AU CONFIRMATION

SOLVING REAL WORLD PROBLEMS THROUGH INTEROPERABILITY, THIS CASE STUDY 3 OF 7 IN THE SIF AU PILOT PROGRAM, FUNDED BY THE FEDERAL GOVERNMENT AND SUPPORTED BY THE VICTORIAN DEPARTMENT OF EDUCATION AND EARLY CHILDHOOD DEVELOPMENT.

### → INTRODUCTION

The Digital Education Revolution envisages “technology enriched learning environments” for all young Australians. Key to its success is the capacity to put the right information at the right time into the hands of learners, teachers, parents and policy makers.

Since 2007 Chief Information Officers from Australia’s state and territory education systems, together with colleagues from the Catholic and Independent school sectors and with support from the Commonwealth Department of Education, Employment and Workplace Relations, have been working towards the establishment of an open standard for systems interoperability for Australian schools to enable information to be used when and where it is needed.

This joint initiative, known as “Towards SIF AU”, has enabled the development of a draft SIF Implementation Specification for schools in Australia (further referred to as the SIF AU Spec.) and a business case identifying the costs and benefits of adopting SIF across the Australian Schools Sector. The business case assessed evidence gathered from interviews and surveys with key stakeholders, and through a program of pilot projects aimed at solving practical interoperability challenges making use of SIF. The pilot program was conducted in such a way as maximise the sharing of knowledge and solutions across projects

and produce a knowledge base of enduring value to the schools sector.

This is a summary case study of one of these pilots.

### → OVERVIEW

#### **A LOCALISED SIF IMPLEMENTATION SPECIFICATION TO SUIT AUSTRALIAN JURISDICTIONAL NEEDS**

School jurisdictions currently have an extensive and increasing number of information systems where many have diverse and customised propriety means of importing and exporting data. There is also a growing need for timely data exchange between these disparate system to fulfil needs such as supply of online learning materials, national and jurisdictional reporting, assessment and identity management. The increasing demand for this interoperability make it progressively more expensive and time consuming to supply individual customised solutions.

Open standards underpin innovation. The World Wide Web and email are both examples of open standards which have had significant impact in enabling computers to exchange information even though divided by distance, brand, software or operating system. In the US and UK, SIF has emerged as a key educational open standard for data transfer between dissimilar systems. The SIF standard is designed to be

adapted and expanded to suit the needs, structures and nomenclature of various national educational jurisdictions.

The intention of Pilot 1.3 (SIF Specification Confirmation) was to confirm the validity of the draft SIF AU Data Model (Release Candidate 1) in an Australian education context. The outcomes of this pilot will inform the next release (RC2) of the SIF AU Data Model which will progress to become the ratified SIF Implementation Specification (Australia) 1.0.

The four jurisdictions running pilots as part of the SIF AU pilot program phase one; (Western Australia, South Australia, Tasmania and the Catholic Education Office Melbourne) developed agents that addressed a variety of business needs, focusing on student, school and timetabling information. Their work proved both the necessity and the viability of a localised Australian Data Model.

The pilots also revealed a number of issues such as:

- the importance of vendor implementation and agility in implementing localised data models.
- the flexibility of SIF under complex data mapping demands.
- the need for further expansion and development of the SIF Implementation Specification (Australia) (SIF AU spec).
- the difficulties posed by non-conforming data codes in legacy systems.

## → PARTICIPANTS

The project was sponsored by Adam Todhunter, CIO of the Department of Education and Early Childhood Development Victoria (DEECD). Funding from the Federal Government's Digital Education Revolution Fund (DER) was provided through the SIF AU program.

A central figure amongst participants was the SIF AU team data expert, who not only supervised the progress of the SIF AU spec but also assisted developers from all pilots in data mapping issues.

The SIF AU Data Standards Working Group (DSWG) made an important contribution to the project. This group consisted of data analysts, standards experts, developers, and representatives of CIOs from: the Education Departments of WA, NT, QLD, SA, TAS, NSW, ACT, VIC; the National Catholic Education Commission, education.au, the Association of Independent Schools, DEEWR, ABS, and PMRT. The DSWG continues to oversee the further development and maintenance of the SIF AU spec.

## → KEY FINDINGS

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As the pilot progressed, a number of key findings emerged:

- **The DSWG further refined the Australian data model.** Members of the DSWG provided a valuable breadth of data management experience in reviewing proposed specification changes. The

DSWG provides a medium through which the needs of all jurisdictions are recognised and advocated.

- **The SIF AU Team data expert provided essential support.** All participants involved in data mapping had occasion to call on specialist knowledge from the SIF AU team of the fledgling SIF AU spec. The data expert solved numerous roadblocks for other pilot teams.
- **The SIF AU spec supported the interoperability needs of the Phase One pilot program.** However, to continue to serve the needs of the Australian education sector, the SIF AU spec will require ongoing development. This will include continual engagement with local industry and SIF vendors.
- **There are many steps and dependencies in planning a specification release.** Ample lead time is required to fulfill the needs of jurisdictions, the SIF Association US and vendors.

## → PARTICIPANT EXPERIENCE OF THE PILOT

Participants found the availability of the SIF AU data expert extremely helpful, especially in removing roadblocks to development. In developing data mappings, one developer commented:

"[the SIF AU data expert] was very helpful in sorting out some of the objects and pointing me to the right direction."  
[JH 31/5/09]

## → SOLUTION

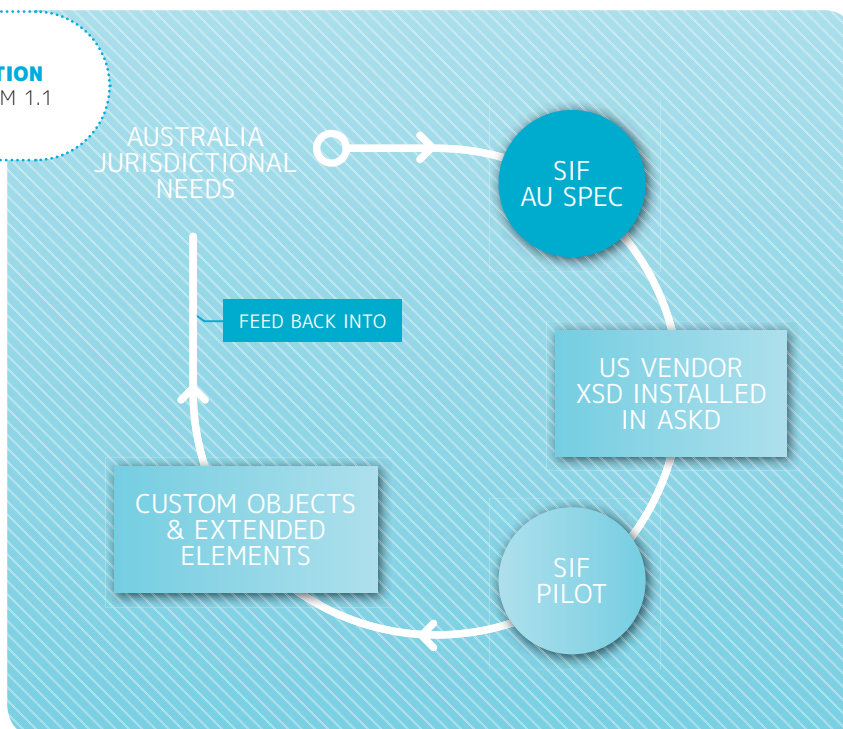
Release Candidate 1 (RC1) for the SIF Implementation Specification (Australia) was developed in conjunction with the SIF AU Data Standards Working Group (DSWG). This was a draft SIF AU spec open for comment and refinement.

The DSWG group started their work in late 2007. They looked at the SIF Implementation Specification US, especially focusing on areas relating to student, attendance, timetabling, behaviour and assessment information. This group then mapped various SIF Elements back to their student information systems. They formed a consensus that there was enough similarity in definition in the data structures used by jurisdictions in these areas to justify the development of some common data definitions and objects. These formed the basis for a draft Australian Data Model. Jurisdictions found most commonality in the areas of student, attendance and timetabling information. Common definitions around behaviour data were considered too difficult to pursue at the time primarily due to privacy concerns about the sensitive nature of this information. Similarly, the creation of common SIF objects for assessment was considered to be important, but was delayed until work on the National Curriculum, NAPLAN (National Assessment Program – Literacy and Numeracy) and national reporting was further developed.

The group worked together to produce the initial draft SIF AU spec RC1 which was sent to the SIF Association US on 30th March 2009 so that it could be produced for review and confirmation during the SIF AU Phase One pilot program. The SIF Association US then provided the SIF AU team with a set of technical XSD documentation that contained the draft SIF Implementation Specification (Australia) which was to be used in the pilot program.

On commencement of the pilot program, the SIF AU XSD documentation was made available to vendors to load into their Agent Software Development Kits (ASDKs) and Zone Integration Server (ZIS) software. This vendor software was modified to contain the draft SIF AU spec. Jurisdictions mapped their data requirements for each pilot (and code set values where applicable) against this Australian specification. Where individual pieces of data could not be mapped to SIF AU spec RC1, individual pilots added custom extensions (SIF Extended Elements). Any gaps in the specification which required a larger container of

### SOLUTION DIAGRAM 1.1



information were addressed in pilots by using SIF Custom Objects. Both concepts are acceptable to the SIF standard and are used in all localised SIF Data Models.

Such extensions are used to:

- 1 Enhance the SIF Implementation Specification for individual cases that may be required for isolated data transfer.
- 2 Inform the next release of a SIF Implementation Specification.

The SIF AU spec RC1, together with any required extended elements and custom objects, was used by all other SIF AU Phase One pilots.

At a conference on July 31st, part-way through the Phase One pilot program, the DSWG reviewed all extended elements and custom objects used in the pilots. Where an element or object was of wider interest than its originating pilot, it was proposed as an addition for the next release of the SIF AU spec. The DSWG continues its work, which includes assessing changes to the US and UK SIF Implementation Specifications for their relevance to Australia, as well as reviewing further Australian data interoperability needs such as assessment.

The work is supported through use of the same groupsite used by all pilots, as well as by webinar, teleconference and bi-annual conference workshops.

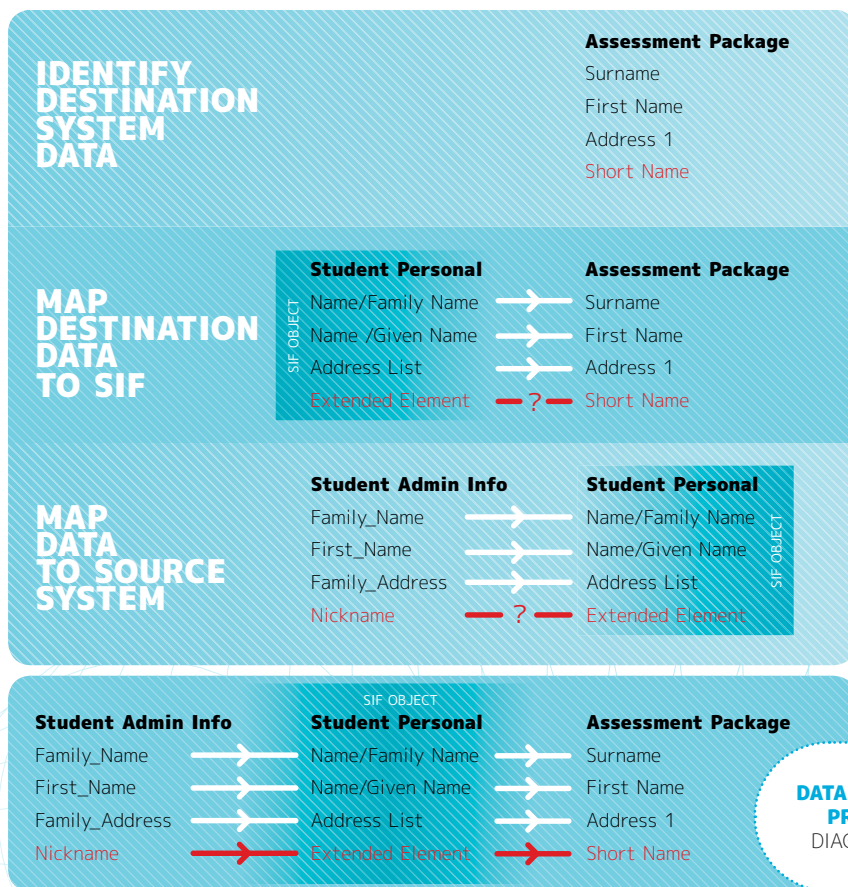
Visual Software, a SIF ASDK vendor was asked to conduct an independent review of the release candidate documentation and resulting XSDs to identify inconsistencies and suggest improvements.

### THE COMPLEXITIES OF DATA MAPPING

When working on the data needs of the pilots themselves, it was found that the larger and more jurisdictionally specific data sets required more discussion and consultation between the parties involved. They also required larger sets of extended elements. For example, the SA pilot required the transfer of a large amount of student data from distributed systems to a central consolidated database without changing any data structures. This involved the transfer of data structures very specific to the SA jurisdiction.

Similarly, the Catholic Education Office (Melbourne) needed very complex data mappings that included information about where students studied particular languages.

These demands led to discussions amongst the DSWG about which of the extended elements used to implement such data transfers should be added to an AU localised specification and which should



simply remain custom to the CEOM and SA jurisdictions. Ultimately four extended elements from these pilots were added to the SIF AU spec RC2.

The WA pilot identified a need to send groupings of data that spanned more than one school. To satisfy this need, they created custom objects. A new SIF Object and new SIF Common Elements were added to SIF AU spec RC2 as a result of this pilot.

### DATA MAPPING PROCESS

It was observed that data mapping was best performed as a five-step process:

- 1 From business requirements, identify what the destination system (subscriber) needs to receive.
- 2 Map destination data to SIF AU spec data elements within objects. Identify any required data that cannot be mapped to existing objects or elements.
- 3 Map the SIF AU spec data elements identified in Step 2 to data in the source system. Implement extended elements or custom objects as required.
- 4 Identify any gaps in information that the destination requires but that the source system cannot supply, as well as any issues with SIF Mappings.
- 5 Identify any specific rules associated with data elements that both agents need to be aware of.

Another significant learning from this pilot was the number of steps and dependencies required to produce a localised SIF Implementation Specification. These include:

- 1 Identify objects necessary to jurisdiction needs.
- 2 Agree on naming conventions for elements.
- 3 Define code sets:
  - a Identify elements that require code sets.
  - b Identify external code sets that could be applied.
  - c Develop and agree on internal code sets as required.
- 4 Create documentation required by the SIF Association US to create the XSD documentation for the SIF AU spec.
- 5 If going into production, the draft specification will then be reviewed by both the local and international community as well as the US Technical Board.
- 6 After approval, the XSD specification and original documentation is made available to ZIS vendors for integration into ASDKs and ZIS.

It was found that gaining agreement from numerous stakeholders, approval times from the SIF Association US and

long vendor tool development cycles resulted in long timeframes between the development of a SIF AU spec and its implementation. In addition, increasingly frequent releases of specifications from other countries have to be examined continually to ensure that the SIF AU spec is not “reinventing the wheel”. For example, the latest SIF US spec contains objects that solve problems identified earlier by the DSWG with regard to identifying parents of students. Accordingly, the next release of the SIF AU spec will include this and other useful overseas developments.

Based on the experience of this Pilot, the DSWG has identified the need for a mechanism of harmonising localised specifications. Suggestions will be made to the SIF Association US via the Interim SIF AU Board.

## → BENEFITS

Some of the benefits of the pilot include:

- consolidating the process by which jurisdictions can work together to share knowledge and identify common data exchange requirements.
- consulting with the DSWG to provide recommendations on future interoperability data requirements of a working SIF AU spec to the Interim SIF AU Board.
- testing and proving new parts of any SIF AU spec against the actual needs of jurisdictions and the real-world pressures of development and testing.
- identification of current constraints and potential solutions in the management of an international standard with local implementations.
- further development of data consultation capacity to aid future SIF development in Australia.

## → NEXT STEPS

Create Version 1 of the SIF Implementation Specification (Australia)

## → ABOUT THE SYSTEMS INTEROPERABILITY FRAMEWORK

The Systems Interoperability Framework (SIF) is a simple but powerful tool for

effectively integrating information from diverse computer systems. SIF manages both the “what” and the “how” of information sharing. Its core components are: a specification of what is to be transferred (the SIF Implementation Specification Australia); a software agent that maps the information in a computer system to that Specification; and a traffic cop directing the flow of information between systems called the Zone Intergration Server (ZIS).

The SIF Implementation Specification (Australia) is administered in Australian jurisdictions by the interim SIF AU Board, and internationally certified by the SIF Association.

## → MORE INFORMATION

For more detailed information, see the SIF AU Phase One Pilot Program Case Study. This study also forms one of seven summary case studies on pilots from Tasmania, Western Australia, South Australia, Catholic Education Office Melbourne, Enterprise Scale SIF, National

Systems Interoperability Service and the SIF AU Specification.

You can find case studies and other useful information on the SIF AU website:

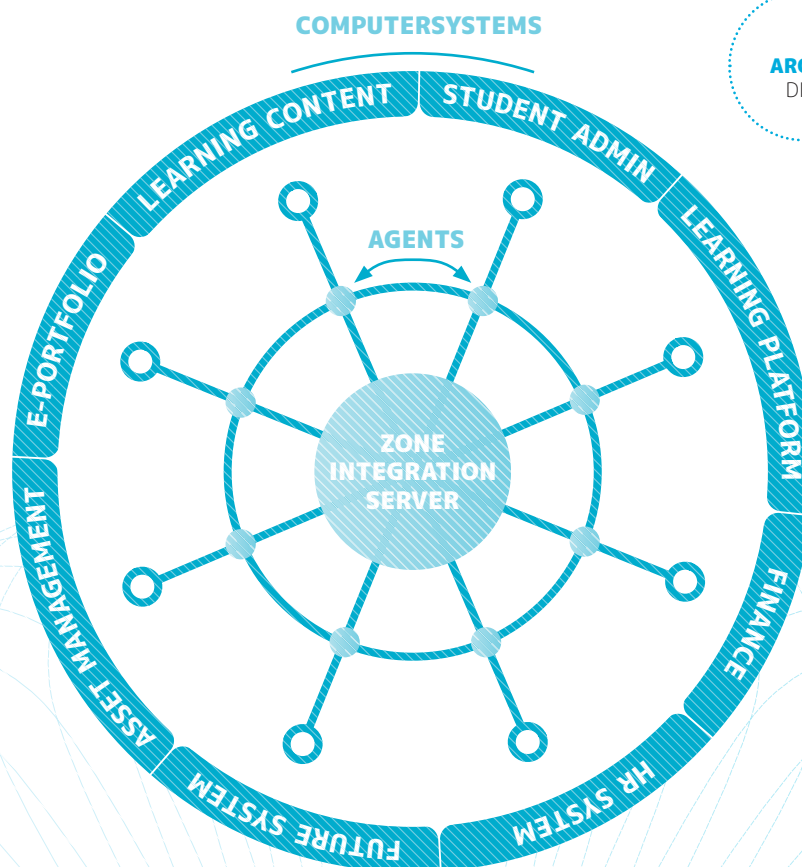
**<http://au.sifassociation.org/>**

You can contact SIF AU by email:

**[info-au@sifassociation.org](mailto:info-au@sifassociation.org)**

## → ACKNOWLEDGEMENTS

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