SIF Systems Interoperability Framework Association AU

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

→ INTRODUCTION AND BACKGROUND

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: IMPLEMENTING NATIONAL SIF INTEROPERABILITY SUPPORT

A number of pilots were commissioned by the SIF AU Phase One pilot program to test the suitability of SIF to the Australian K12 education sector. One purpose of these pilots was to test the new SIF Implementation Specification (Australia) (SIF AU spec) in real-world situations. Because all pilots depended on the availability of the Zone Integration Servers (ZIS) essential to all SIF operations, a pilot was commissioned to provide such resources, along with other support servers. ZIS servers and Agent Software Development Kits (ASDKs) for three different SIF vendors were used, as it was important to demonstrate that SIF solutions were not dependent on specific vendors.

Access to the servers, along with instructions to help developers set up and use their agents on the servers, was provided via the common groupsite.

→ PARTICIPANTS

The project was approved by the SIF AU Interim Board and sponsored by Adam Todhunter, CIO of the Department of Education and Early Childhood Development Victoria (DEECD). Funding from the Federal Govenment's Digital Education Revolution Fund (DER) was provided through the SIF AU program. The Curriculum Corporation provided the NSIS server infrastructure.

Importantly three SIF vendors contributed to the project and provided significant support. RM-Asia Pacific, Edustructures and Visual Software provided ASDKs, ZIS software and support for the pilots.

THE OPEN SOURCE FRAMEWORKS, DEMONSTRATIONS AND AGENT CODE ORGANISED BY NSIS ARE READY FOR THE NEXT ROUND OF PARTICIPANTS LEARNING ABOUT SIF

→ KEY FINDINGS

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

- **Development time and cost was reduced** due to co-learning, collaboration and working to a common data specification. Using the groupsite as a medium, people worked together with increasing enthusiasm and confidence, updating each others documents, helping each other across jurisdictions, and sharing access to experts.
- **The Australian SIF specification works,** however it needs ongoing development to serve the needs of the Australian educational space. Continual engagement with SIF and local industry vendors is required to develop and further the standard.

* **The SIF AU spec is viable.** This pilot successfully demonstrated the viability of integrating the SIF AU release candidate specification with vendor-supplied ASDKs and ZIS in Australia, for Australia. It established the conditions, costs and an evidential base for the continuance of the National Systems Interoperability Service.

- **The NSIS common infrastructure supported problem solving.** Through centralised infrastructure, effort for set up and configuration time was cut to close to zero (excepting firewall issues) due to hardware reuse. Also, each pilot required less expertise to use the NSIS service than to establish their own ZIS/ASDK server setup, thus lowering the barrier to entry for those new to SIF.
- **NSIS provided a technical forum for developers.** Using the NSIS space as a meeting place on the groupsite enabled technical discussions for developers and those involved in using SIF operationally. It also provided a useful central point to host SIF learning materials.
- **NSIS hosted reusable artifacts:** The open source frameworks, demonstrations and agent code organised via NSIS are ready for the next round of pilot and production participants learning about SIF.
- **NSIS managed multiple SIF versions and ZIS/ASDK implementations:** Having various versions of SIF available and managed online reduced development barriers for all pilots.

→ PARTICIPANT EXPERIENCE OF THE PILOT

Pilot participants experienced some frustration at the outset in jurisdictions with security policies that prevented straightforward access to the servers. Others expressed the need for assistance to configure SIF servers for the SIF AU spec, highlighting the need for both a well-established and comprehensive test server rig for SIF development and rapid vendor responsiveness to the needs of the new SIF AU spec.

Early in the project, one developer wrote: "Someone needs to set up all the required versions, schemas and handlers properly on the test ZIS server..." [JM 30/6/09]

Due to the support supplied by the NSIS and SIF AU teams and frameworks developed by both the WA team and the TAS team, the same developer was able to work through these problems and report that he had been able to get the two previously incompatible systems in his pilot to function via SIF and the test ZIS server: "Our systems both communicated with each other as expected!" [JM, 4/8/09]

These issues were quickly described on the groupsite for the benefit of other participants: "I posted the versioning issue in the forum, which now contains some information for people who may come across the same problem." [JM 1/7/09] Ultimately versioning problems were "resolved by cross-jurisdictional support" [DI 21/07/09].

Various participants observed that example agents in a working example system would have made development work much easier to tackle initially after the theoretical phase of SIF learning. As a result of this an example project was created and is hosted in the NSIS section of the groupsite, ready to assist Phase Two pilot participants.

The initial lack of support for the SIF AU spec in the ASDKs caused problems for some participants. As the SIF AU spec was still in draft form some vendors needed more time and guidance than expected to integrate the Release Candidate into their ASDKs. It became clear that the process of integrating an AU specification into an ASDK was rather more complex than the automated process that the SIF AU team had expected.

A two-fold learning emerged from this situation:

- Consideration of adequate lead times is important to consider when delivering SIF AU spec releases to vendors.
- Further progress is sought by the SIF Association and vendors to simplify the process of integrating specifications into ASDKs, so as to avoid a mushrooming effect as more countries develop localised specifications.

→ SOLUTION

The Systems Interoperability Framework (SIF) can effectively integrate information from diverse computer systems through its simple but powerful design. SIF provides both the "what" and the "how" of information sharing. The core components are:

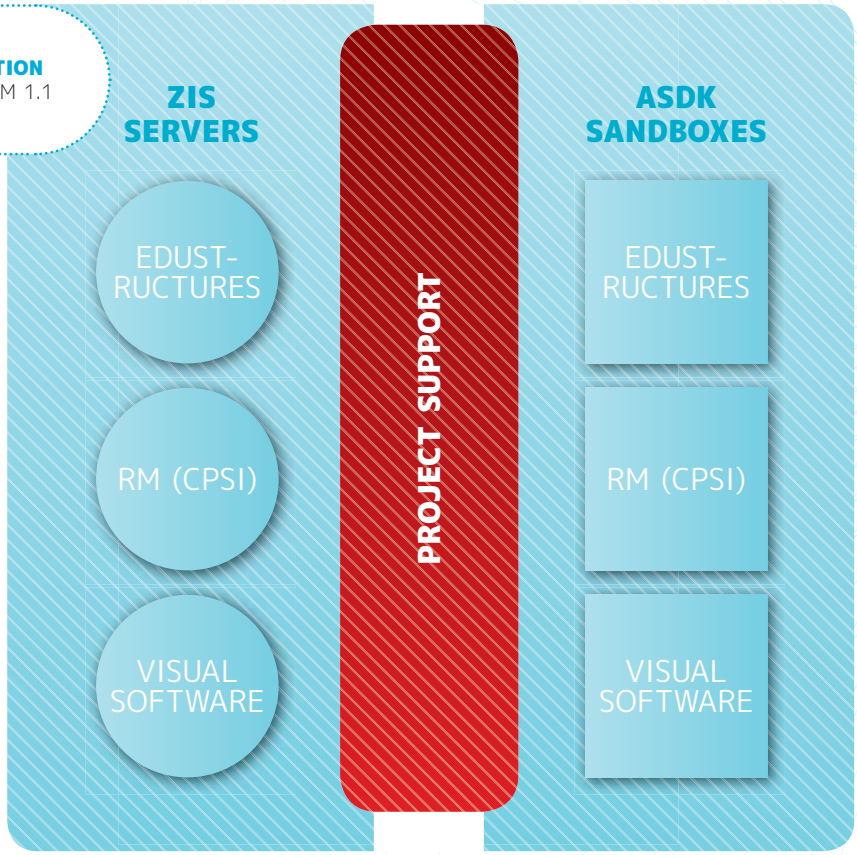
- a specification of data elements (called the SIF Implementaion Specification) to which information can be mapped;
- an application (called an agent) that maps the information from computer systems to that specification;
- and a traffic cop (called a Zone Integration Server) that directs the information between systems.

The US and the UK have their own SIF Implementaion Specifications for the transfer of data. Australian jurisdictions have some unique data requirements therefore the SIF AU spec must be distinct from both the US and UK specifications, despite sharing considerable commonalities.

Forming late in 2007, the SIF AU Data Standards Working Group (DSWG), composed of leading data experts from around Australia, has developed the Australian Specification. During April 2009 the SIF AU team worked with the US SIF Association to create the first Release Candidate (RC1).

GROUP SITE COLABORATION
DIAGRAM 1.2

SOLUTION
DIAGRAM 1.1



The NSIS was designed in May 2009. The Curriculum Corporation then commissioned the servers in less than a month. All members of the Phase One pilot program were given accounts on the servers. The first ZIS was operational by mid-June. Since then over 250,000 messages have been sent using NSIS.

There are six servers in NSIS, one for each of the three vendors' ZIS and one for each of the vendors' ASDKs. While the ZIS servers were well used, the agent servers saw low usage as developers preferred to download and install agent software on their own computers.

GROUPSITE COLLABORATION

The NSIS pilot was centered around collaboration. Part of the groupsite was dedicated to discussions, support materials and the sharing of agents that had been developed. This part of the groupsite generated over 200 pages during the 12 weeks of the Phase One pilots. Many of these will be be reused in Phase Two.

The NSIS space on the groupsite became the logical rallying ground for developers seeking or offering technical advice and solutions. For example, NSIS hosted the key frameworks that speeded development in most pilots.

IT WAS IMPORTANT TO DEMONSTRATE SIF SOLUTIONS WERE NOT DEPENDENT ON SPECIFIC VENDORS

→ BENEFITS

This pilot has successfully provided essential enabling infrastructure to all jurisdiction-based pilots in this phase. It has:

- helped test the SIF AU spec RC1 in the real world.
- highlighted the frustrations and barriers to collaboration caused by heavy security.
- enabled verification of vendor-independence for SIF agents (an important test of an open standard).
- reduced the start-up time and the level of expertise required for each jurisdiction's involvement in SIF.
- acted as a central collaboration point for all other pilots in the program.
- revealed the need for SIF Vendors and the SIF AU team to remain in sync for the ongoing development of the SIF AU spec.
- hosted vendors and open source software tools in a one-stop shop for testing and reusing SIF artifacts.

NSIS has clearly demonstrated the need for an ongoing NSIS ZIS server for development, but has highlighted the need for further enhancements to the installed ASDKs and servers, testing frameworks and documentation for such a server cluster.

It has also enabled the more general benefits listed below for each of the jurisdiction pilots:

JURISDICTION BENEFITS

It has proved useful to have a SIF solution tested in the context of jurisdictional infrastructure. Staff capability in interoperability has been developed. Methods, examples and an emerging culture of sharing of information about interoperability with other jurisdictions has been established. Additionally, the pilots project provided a model for replacing existing bespoke interoperability mechanisms with a method based on open standards, and explored some of the real-world issues associated with that process.

This jurisdiction has gained considerable benefit from helping create a piece of national infrastructure. The open-source agents and frameworks created can be reused collaboratively, with the complementary advantages that maintenance is shared (reducing costs), expertise is preserved and a larger pool of users is available to share problem solving. This is a starting point for a knowledge- and code-base that can be reused across Australia, distributing capability that can ultimately enable jurisdictions to solve the increasing complex problems that the Digital Education Revolution will present.

WIDER BENEFITS

This pilot has assisted in the testing and implementation of the newly-developed Australian SIF standard. In addition, the SIF skills developed in staff are highly transferable to other jurisdictions or vendors working with SIF.

→ NEXT STEPS

Possible next steps include recommending an ongoing NSIS facility which will:

- make accessible open source agents, frameworks and demos/examples for Phase Two pilots, enabling significant reuse of these valuable Phase One pilot artifacts.
- enhance SIF learning resources to create check lists and template documents.
- organise the Phase One solution documents to reduce the entry barrier for Phase Two and beyond.
- rationalise the NSIS server structure to 3 servers, each combining the ASDK and ZIS server from a single vendor.

→ 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**

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