

Interoperability Review

Education, Skills and Children's Services

Interoperability Review

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Scope

1. The scope of this review covers the sharing of ESCS data:
 - (a) Within the geographic boundaries of Local Authorities
 - (b) Between Local Authorities
 - (c) Between local and regional partnerships or consortia (e.g. for Diplomas) that may span geographic boundaries
 - (d) Between national delivery partners and central ESCS organisations
 - (e) Between the ESCS system and other government sectors
2. The sharing of ESCS data across the “four nations” was excluded from the scope from this review.
3. The technical scope of this review covered the standards and mechanisms for the physical exchange of data. Business data standards that underpin the physical exchange of data were not within the scope of this review although were considered where it made sense to do so.

Approach

4. The review was conducted rapidly over an 8 week period. Evidence was drawn from earlier reviews and related documentation (such as *“The strategic case for adopting the Schools Interoperability Framework within the UK”*) as well as from interviews with representative stakeholders from across education, skills, and children's services and other government sectors.

A three tier model for interoperability

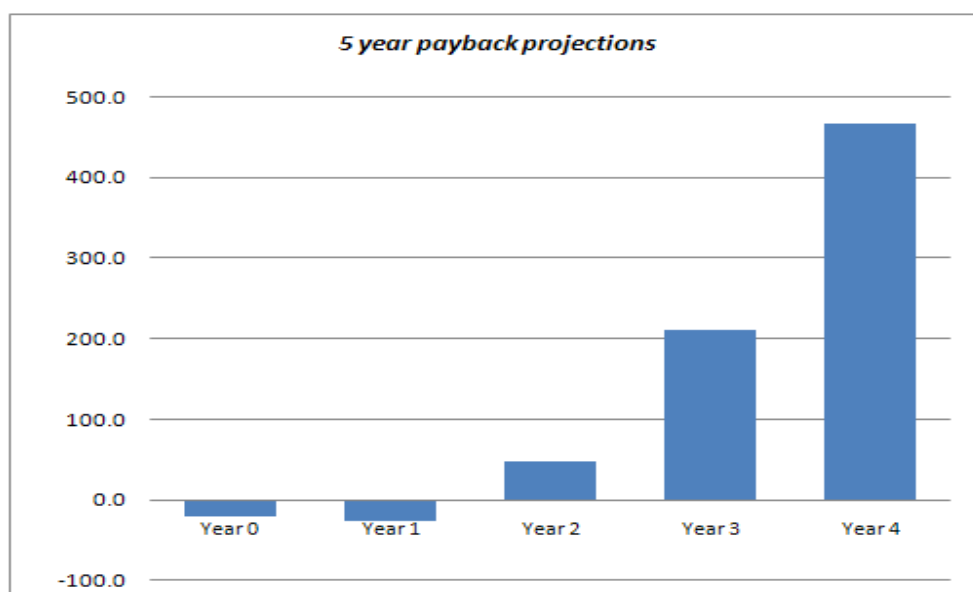
5. For the purpose of the review three “tiers” of interoperability were considered:
 - **Tier 1 Local** – vertical and horizontal interoperability for education, skills and children's services organisations and systems within the geography of a local authority
 - **Tier 2 Regional** – vertical interoperability between groupings of local authorities and national organisations and systems; and between frontline organisations (as well as consortia organisations) and systems that cross local authority geographic boundaries.
 - **Tier 3 National** – horizontal interoperability between national education skills and children's services organisations, and between national education skills and children's services organisations and other government departments and sectors.

Continuing as we are is not an option

- The review concluded that doing nothing is not a tenable option. The current lack of interoperability capability is estimated to be costing in excess of £300 million per annum across education, skills and children's services.

There is a compelling case for a national interoperability capability

- The Interoperability Review estimated that a national interoperability capability has the potential to deliver financial benefits of c£250 million per annum and that the investment would show a positive return within 3 years.



- In addition to the financial case, a national interoperability capability is a necessary condition for delivering joined up services to learners, families and young people; for achieving cross system efficiencies; and for the more effective collection and use of data to underpin policy development and evaluation.

The recommended solution

- The Review recommends the development of a central capability to support National (Tier 3) and Regional (Tier 2) interoperability.
- The Review concludes that Local (Tier 1) interoperability solutions cannot be mandated from the centre. Front-line service providers and local authorities should be responsible for deciding their own local solutions. However, these solutions would need to comply with a framework of national standards for interoperability.

National standards and compliance

11. It is essential that all interoperability solutions (across Local, Regional and National Tiers) comply with a framework of national standards and guidelines.
12. The Information Standards Board (ISB) has paved the way with an evolving set of national business data standards to underpin the physical exchange of data between systems, although its technical support service will need to be better resourced going forward if it is to meet its aspirations and satisfy the needs of education skills and children's services.
13. The business data standards need to be complemented by a framework of national technical standards and guidelines, compliance and governance to cover the mechanisms for physically exchanging data and sharing services.
14. Capabilities will need to be established in the following areas:
 - (a) Interoperability investment appraisal and benefits management
 - (b) Technical standards and guidelines (including XML and messaging as well as web service standards)
 - (c) Security standards and guidelines
 - (d) Best practices, guidelines and templates for implementation, procurement and product selection

Systems Interoperability Framework (SIF) findings and recommendations

15. The Interoperability Review noted the following issues:
 - (a) **Basic interoperability capabilities (connection, data exchange and context)** – SIF was designed to support the horizontal flow of information across different systems within a school (e.g. school MIS to catering and library) and vertically through geographic domains e.g. school to district to state. Implementation of SIF in the UK context has resulted in complex workarounds to support horizontal interoperability (e.g. between schools and FE colleges for Diplomas) within a SIF geographic region (Tier 1) and is likely to prove unworkable for inter-region and cross local authority (Tier 2) interoperability.
 - (b) **Message management capabilities (traffic management, delivery and routing services)** – SIF is designed to “broadcast” to all recipients within a SIF Zone rather than being targeted at specific users and / or systems. Messages cannot be split and component parts directed to different recipients. There is no capability for optimising traffic flow through the SIF Zone or for assuring end-to-end delivery across Zones. Vendors are developing proprietary workarounds to address these issues at the local (Tier 1) level. Unless these issues are resolved, SIF cannot be considered as an

effective solution for horizontal interoperability between Local Authority (or Grid for Learning) geographic boundaries (Tier 2).

(c) **Security capabilities** – UK and EU security and data privacy regulations are significantly more extensive than those in the US (where the SIF interoperability specification was developed). Consequently, the SIF specification does not adequately support UK security regulations and requirements in areas such as:

- Impact level identification and management (especially as data aggregates to Impact Levels 3 and 4 at the regional and national levels)
- Intrusion and penetration detection
- Role based access and authentication
- Non-repudiation
- Audit trail management
- Error reporting (errors broadcast to all)
- Attribute level data security

Local, non standard implementations and SIF extensions are being developed to address the above issues on a local level – this piecemeal approach will be a substantial barrier to SIF's ability to scale to meet security regulations at regional and national levels.

- **Service discovery capabilities** – SIF has no facilities for the discovery of services (such as access and authentication; and national and regional indexes of service recipients, practitioners and providers).
- **Identity verification** – local organisations are developing proprietary solutions for identity verification and learner indexes. These should be provided on a national level (where some capabilities already exist).
- **Data model** – SIFA UK has agreed to adopt the ISB National Business Data Standards. This conveys the benefit of cutting out the need for SIF working to groups to expend members' time and resources on business data modelling activities, allowing these groups to focus on ensuring the alignment of SIF XML specifications.
- **SIFA UK governance** – The UK Systems Interoperability Framework Association (SIFA UK) is driven by members and managed through committees of willing volunteers. Consequently developments tend to be driven piecemeal by immediate operational needs, without the direction of an overarching strategic roadmap. Progress is reliant on volunteer effort. Whilst this approach has been very successful in building community interest, it is not at this stage of evolution sufficient to drive through the development of substantive national interoperability specifications, where dedicated expertise and a coherent design mentality is needed.
- **Intellectual property** – ownership of the SIF interoperability specification (Agent and

Zone) is retained by the US organisation and any changes have to be agreed at this level. SIF US has a stated intention to release a web services version of the interoperability specification towards the end of 2010 (Columbus). This would theoretically open SIF up to the independent Web Services market (e.g. for security). However, the roadmap for delivering this has not been articulated and it is not clear how SIF would deal with issues of backwards compatibility (a particular issue with its substantial US user base), and variability between the US and UK specifications that would invariably be required.

16. In summary, SIF was not designed for the UK education, skills and children's services system, and requires substantial vendor specific workarounds to meet requirements in key areas such as security. These workarounds are being developed in the absence of enterprise wide architecture standards. This will inhibit the extensibility, scalability, openness and flexibility needed in order for SIF to be considered as a viable approach for regional and national interoperability (Tiers 2 and 3). SIF could be considered as a viable solution for local interoperability (Tier 1) if a local authority so chooses, as long as it complies with the framework of national standards outlined above.

“Web services have become deeply embedded in mainstream administrative application suites in higher education. They are no longer considered nice to have, but are a requirement for academic and administrative applications. Web services are increasingly considered as an interoperability strategy for administrative suites in K-12 education, challenging SIF (Schools Interoperability Framework) and other integration strategies.”

Gartner's "Hype Cycle for Education, 2009" report ref. G00168224

Delivery Capability

17. “Pump priming” investment will be needed to:
 - (a) Define the framework of national standards
 - (b) Develop a central “spine” capability to cover Tiers 2 and 3 (regional and national interoperability), leveraging existing assets where possible
 - (c) Establish a new business service to manage the ongoing development and operation of the central spine, to drive compliance of local solutions against the national standards, and to orchestrate the implementation of interoperability across all tiers.
 - (d) It is anticipated that the development, maintenance, support and operations of the national spine could be outsourced.

Governance

18. To complement the Information Standards Board, a similar system wide governance body needs to be established, responsible for:

- (a) Interoperability strategy and “direction of travel”
- (b) Investment prioritisation and approval
- (c) Interoperability standards and guidelines

Roadmap

19. The roadmap below outlines an initial high level plan for delivering national interoperability across education skills and children's services. The roadmap is made up of four main phases of work:

- **Phase 1** – Establishing the capabilities needed to develop and drive compliance with national standards as well as those needed to build and manage a central “spine” spanning central and regional tiers (Tiers 3 and 2)
- **Phase 2** – Developing the framework of national standards, guidelines and best practices and conducting an initial assessment of the impact on current systems and procedures (particularly on existing local solutions)
- **Phase 3** – Planning for the delivery of a regional and national interoperability service
- **Phase 4** – Delivering regional and national interoperability services