

This paper is for decision makers in research and education institutions who seek to develop flexible and adaptive technology infrastructure that will allow efficient and cost-effective information sharing and better alignment of Information and Communications Technology (ICT) and working practices.

Introduction

Research and education institutions need a flexible information technology infrastructure that allows information to be shared easily within the institution and externally too. The e-Framework for Education and Research is working with projects in JISC programmes and is supporting decision makers taking a service-oriented approach to system development, gathering the learning, techniques and experiences gained, evaluating the costs and benefits and making these more widely known.

The international e-Framework aims to be a strategic planning channel to smooth progress towards technical interoperability. It will help with prioritising investment and development as well as with prototyping the open standards, specifications and interoperability technologies needed to build service-oriented architectures.

The international e-Framework partners are national bodies responsible for funding IT development in education and research. The partners are: Australia's Department of Education, Employment and Workforce Relations (DEEWR), the New Zealand Ministry of Education, and SURFfoundation in the Netherlands.

Context

Much of the code in different software applications performs the same basic tasks such as access management, file data management and providing the user interface. Often only a small part of the code is unique to an application.

All this redundant code costs money to create and maintain. A service-oriented approach can reduce the total amount of code that an institution needs to support, reducing costs.

The service-oriented approach is a software design method. It identifies functions common to a number of different applications and separates them out as reusable service modules that can talk to each other.

Services can be called on and integrated by smaller, lightweight, composite applications that sit above the services. Either new services can be built or, more likely, web service interfaces can be defined to work with existing systems, making their information and functions available to other applications.

Once identified, the service modules need an open interface, and the wider the agreement on this open interface is, the greater the market will be for such services and the lower the price.

The service-oriented approach results in a Service Oriented Architecture (SOA) or Enterprise Service Architecture (ESA).

The e-Framework

The international e-Framework website has defined an evolving service-oriented technical knowledge base, where details of how the service components work are described and documented using an agreed common vocabulary.

It also models and documents an outline of how to design, implement and deploy applications and systems that are built using the components.

The international e-Framework provides:

- Information about services, available open specifications and standards, and Service Usage Models (SUMs) – a composition of services that perform a specific function
- Links to background information on good practices, embedding process models, design and implementations

The JISC e-Framework Programme

Complementary to the work being carried out by the international e-Framework initiative, the JISC e-Framework programme is exploring other ways to enable a service-oriented approach to higher and further education technologies and improve interoperability between systems.

The JISC e-Framework programme is currently in the process of building an innovation knowledge base to gather the relevant achievements of JISC-funded projects and make them discoverable. The knowledge base will focus on aspects such as stakeholder and task models, good practices, process maps and models, and functional aspects of software. As such, it is designed to complement the service technology components that are gathered in the international e-Framework knowledge base.

The e-Framework

Version 2: April 2008

Benefits

The e-Framework will give institutions an approach to improving return on investment in existing systems, more effective communications between communities and interoperability within and across institutions and national boundaries.

The e-Framework's service-oriented approach has wide-ranging benefits:

- **It reduces costs by reusing common functions and sharing information more widely.** It identifies common functionality and makes this available from existing systems by providing them with web service interfaces while increasing their value by making information that is locked up in these systems more widely and easily available
- **It reduces the cost of updating systems.** When replacing an old system, as long as new systems or services can be provided with the same open-services interfaces, applications that worked with the old system will work with the new system. If new functionality is required, it is possible to provide these as separate common services, paying for them only once
- **It improves performance.** System performance is improved as the smaller applications that sit above the common service modules can be developed more quickly in response to evolving priorities while greater diversity can be built upon standardised services. Services supplied behind the open interface can differ in scalability and performance, allowing an institution to balance infrastructure according to its needs
- **It gives institutions better control over their systems.** Institutions will have better control of an open, systems-based architecture and will not be dependent on suppliers of large, closed systems

Current Progress

Institutions are intended to use the e-Framework website to reuse software rather than reinventing the wheel. The international e-Framework website allows decision makers to

review relevant papers and presentations, read success stories and find out what has worked for others as well as use the documented service descriptions.

The website hosts a community that is contributing to the development of the framework by submitting reusable services and collaborating in developing services and SUMs.

Challenges

The e-Framework offers an outline of what is required for a service-oriented approach but the challenge is to develop appropriate new ways of working in the community, then to populate the knowledge base on the website. Developing collaboration and international partnerships is crucial as a mechanism for sharing knowledge and expertise, as is structuring the framework so that contributions from many sources at different levels can be included to further its progress.

Future

The international e-Framework partners have focused to date on developing the website knowledge base and processes for the creation of content. The plan for 2008–2009 is to focus on building content and achieving critical mass.

In 2008–2009 the JISC e-Framework programme plan is to introduce a complementary innovation knowledge base which should offer a new way of visually exploring the functions, roles, activities and applications within universities, and a space in which these can be submitted and discussed in an open way.

The JISC e-Framework programme also aims to increase capacity and capability in the community. A Strategic Expert Group (SEG) has been set up as will be a group of community support editors. Together, they will support and guide contributions to, and the use of, the knowledge bases.

This briefing paper was written by Tracy Caldwell on behalf of JISC. It is the second version of a briefing paper first published in September 2006.

Alternative formats of the briefing paper can be found at: www.jisc.ac.uk/publications

Further Information and Resources

To find out more you can:

Visit the e-Framework website
www.e-framework.org

Visit the JISC e-Framework programme web page
www.jisc.ac.uk/whatwedo/programmes/programme_eframework

Watch an animation describing the benefits of a service-oriented approach for education and research institutions
www.e-framework.org/News/tabid/602/newsid939/21/So-thats-SOA/Default.aspx

See the e-Framework work in progress at the e-Framework community wiki
<https://e-framework.usq.edu.au/users/wiki>

Read an article in EDUCAUSE Review, 'Having Your Cake and Eating It: The e-Framework's Service-Oriented Approach to IT in Higher Education'
<http://connect.educause.edu/Library/EDUCAUSE+Review/HavingYourCakeandEatingIt/44596>

Contact Alex Hawker, JISC e-Framework Programme Manager
a.hawker@jisc.ac.uk