

Overview of the e-Framework

Summary

This paper explains the purpose, expected outcomes and benefits of the work done within the e-Framework. In a concise way, the paper introduces the necessity of tackling the current IT challenges in Higher Education and Research by the Service Oriented Architecture (SOA) concept. The e-Framework is presented as a collaborative approach to making the SOA concept work, and highlights the benefits this approach has for different stakeholders during development and use of a service oriented architecture.

Introduction

Increasingly scholars, researchers and workers who travel all over the world need to connect, share and collaborate with each other while having access to and being able to extract, manipulate and represent information in any way thinkable.

Good connections between people, and between people and information, are essential – but being connected is not enough. The emerging context is one in which technology plays a role in supporting people in whatever they want to do. In this environment, technology is flexible, responsive, and easily adaptable according to need and no longer determines, nor constrains, the possibilities for action.

The service-oriented approach

To meet this changing culture, a new software design paradigm has emerged that will replace the model in which IT companies make large, monolithic application systems. This new approach to software design is primarily concerned with the development and interaction of IT services. This service-oriented approach focuses on the use of small technology services with open interfaces that can easily exchange data with each other, and can be mixed and matched to support business requirements.

The service-oriented approach and the enterprise

Within any organisation, the service-oriented approach should be driven by the business needs of the enterprise. There is growing interest in combining service-oriented approaches with strategic approaches to IT infrastructure development, such as Enterprise Service Architecture (ESA), where business functions are analysed as sharable components tailored to support a business's unique strategy in its unique context. The business strategy is supported by drawing out core functionality needed by a number of different applications into a series of modular components, provided as loosely coupled services.

For example, authentication and authorisation are functions that are very common and beginning to be provided as separate services. When utilised by

other services with an open interface, they can be implemented once and then accessed by different applications when needed.

The creation of an adaptive and flexible IT infrastructure that supports evolving organisational goals is another key element of the services vision. Over time, the local control of specific functionality, coupled with the greater ease of developing and changing software at this level, makes it easier and cheaper to support improved working practices and processes, in addition to being able to integrate new services and applications. This service-oriented approach will help institutions deal with increasing numbers of applications to improve the running of their enterprise by re-factoring redundancy out of the institutional code-base. In doing so, institutions will reduce the total amount of code that has to be maintained.

A service-oriented approach offers better opportunities to reduce costs while increasing performance and control. In conjunction with easier, often community-led development processes, it promises a more positive and longer-term strategy for dealing with the looming higher education software maintenance challenges. On the implementation side, institutions will typically use a variety of technologies to implement and manage the services involved to support a whole enterprise. Adopting a service-oriented approach can therefore be accomplished incrementally. However, when this approach involves an end-to-end systems development, it is often referred to as Service Oriented Architecture (SOA).

Mapping out services

The e-Framework for Education and Research has been established to help the education and research arenas take advantage of the opportunities offered by the service-oriented approach. The primary goal of the e-Framework is to facilitate technical interoperability within and across education and research through improved strategic planning and implementation processes. The e-Framework is a collaborative effort that recognises greater coherence in development is needed and thus aims to provide an overview of current development and experiences in services-oriented approaches.

The e-Framework is guided by these underpinning principles: a service-oriented approach to system and process integration; commitment to open standards; recognition of the central importance of community involvement; the need for open and collaborative development activities; and, deployment of these approaches in a flexible and incremental way. Through following these principles the e-Framework will provide the information that enables a strategic approach to planning development programs.

By using mapping activities, the e-Framework will uncover existing services available for adoption and mainstream use and will explore how new services can be best built to efficiently interact. Through collecting information, reviews, and examples of services and applications, the e-Framework provides higher education and research with a multi-purpose model for service-oriented implementation in the institutions.

In seeing how service interfaces support business requirements, institutions will be able to identify the potential benefit and compare their efforts with other developments while planning their own roadmap. The e-Framework therefore supports institutions in their efforts to organize IT infrastructure in a better way.

Collaborative work

In 2006 the Joint Information Systems Committee (JISC) in the United Kingdom and the Australian Department of Education Science and Training (DEST) in Australia – the initiators of the e-Framework – sought to widen the possibilities of collaboration. Consequently, the SURF Foundation in the Netherlands and the New Zealand Ministry of Education have also become Partners in this global initiative.

All actual and planned work by each of the partners towards a service-oriented approach, primarily driven by national agendas but of potential use outside the national remit, will be collated to populate the documentation available on the e-Framework website. The website will provide a map of the development areas, against which specifications, standards, software tools, applications, and services can be aligned.

Existing services will be deconstructed into components and functions that can define more flexible deployment. Expertise on services analysis, interoperability issues and implementation experience will be shared. Partner experts are encouraged to exchange experiences and work on a roadmap. The four organisations are thus investing in a professional collaborative approach on strategy, technology and communication.

The benefits

The benefits of the e-Framework can be seen from several perspectives, for example:

- **Institutions** – it will enable the alignment of strategies and infrastructure development to support the areas of education and research offering more choice of systems and suppliers and more freedom in terms of buy/build/borrow decisions. It will also lead to improved return on investment in existing IT systems. The e-Framework stimulates more effective communications between communities through shared understanding and interoperability within and across institutions and national boundaries.
- **Developers** – it will support a better understanding and dialogue between suppliers, customers and developers; more rapid development cycles and a faster response to customer requirements; a market that is fit for entry for small innovative players based on flexible business models for software development.
- **Partners** – it will provide a map of a complex environment; a strategic planning tool for prioritized investment in standards development and prioritized investment in interoperability technologies; and an improved return on investment through coordination and collaboration between partners.

Most generally, the e-Framework will provide information about services, available open specifications and standards, and 'Service Usage Models' (SUMs) – compositions of services that perform a specific function. This will include links to background information on use, good practices, embedding process models, design, context, and available implementations plus guidance on many aspects of applying service-oriented approaches to facilitate technical interoperability within and across education and research.

The knowledge base being developed on the website is intended to provide a tool for thinking, planning, and coordination. It will be a strategic tool, to support the international education and research communities in their exploitation of the next generation of technology development.

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