



ENTERPRISE SERVICES ARCHITECTURE FOR HIGHER EDUCATION AND RESEARCH

A Road Map for Efficiency and Innovation

Higher education and research organizations around the world rely on information technology to help them improve operational efficiency, manage costs, and transform the way they meet the needs of students, faculty, researchers, and governments. Enterprise services architecture helps you leverage your current IT assets to provide improved education and research at a lower cost.

Virtually all colleges, universities, and research centers face the challenge of doing more with less. In an age of online shopping, omnipresent ATMs, and 24x7 customer support, students and other participants in higher education have come to expect streamlined, technology-powered services. But no university wants to raise tuition to make process improvements. The challenge is to leverage your existing IT resources to support academic excellence, meet regulatory requirements, and drive innovation – all while meeting ever-rising student expectations.

The IT Challenge

From issuing grades to administering financial aid programs, universities rely on IT to manage processes, support academic goals, and control costs. But despite substantial IT investments, most institutions have a variety of incompatible, isolated solutions in place. These applications typically do a good job of supporting dedicated processes – such as class scheduling, housing assignments, and academic record keeping – but it is often difficult and expensive to link them together to support new functionality or to provide a unified view of information that resides in disparate systems. This incompatibility limits the potential for collaboration between a university's departments, divisions, and schools. It can also cause considerable inefficiency, leading to long lines at registration desks, cumbersome forms, and redundant data storage. The result: frustrated students, mismanaged research projects, lackluster recruiting, and loss of prestige.

Common IT Pain Points in Higher Education and Research

Higher education and research organizations struggle with:

- High total cost of ownership
- Interfaces that require constant, costly maintenance
- Redundant data storage
- Highly specialized systems that depend on skilled users
- Lack of a consolidated view for decision makers
- Inability to integrate IT resources to drive innovation and collaboration

ESA: The Road Map for Higher Education

Pioneered by SAP, enterprise services architecture (ESA) is a business-driven software architecture that provides increased adaptability, flexibility, openness, and cost-efficiency. ESA can help your organization leverage its existing IT assets to quickly and cost-effectively align itself with market requirements, improve service, and manage costs. ESA serves as both vision and road map, enabling you to compose adaptive software solutions based on existing applications and components.

Much of the power of ESA begins with a basic yet powerful entity: the Web service. Simply put, a Web service is a self-contained package of functionality – an independent piece of software that does something useful. Because they are based on open standards, Web services are neutral by nature; they do not require a particular vendor, language, or technology.

When it receives a query or request, a Web service performs an action and responds with a result. For universities, a Web service could be a single command to perform a degree audit, issue a campus parking permit, send a tuition bill, or order lab equipment.

Web services, while extremely versatile, need to be orchestrated and combined to become valuable on an enterprise level. That's the role played by ESA, which provides business logic – information about what services do and how to combine them quickly to achieve a desired result. Thanks to this built-in brainpower, ESA aggregates many low-level Web services and turns them into enterprise services – functionality that can support complex scenarios like grant management or institutional development.

Putting ESA to Work for Education

To understand how ESA can enhance your business processes, let's take a closer look at how ESA supports student life-cycle management – a multifaceted aggregation of processes and activities that starts with attracting an admission prospect and ends with the awarding of a degree. The primary steps in this scenario typically include recruiting, admission, registration, financial aid management, maintenance of academic records, degree auditing, and graduation. In many cases, the links between these processes depend on paper forms, faxes, telephone calls, data reentry, and spreadsheets. With this many handoffs, managing the end-to-end scenario tends to be inefficient, time-consuming, and error prone.

Many university IT departments have attempted to manage complex scenarios like this by deploying such tools as enterprise application integration (EAI) software or by hard coding links between existing applications. This approach works, up to a point, but it creates a complex and costly IT landscape that is very difficult to change later on. ESA provides a more flexible solution to the integration dilemma by using composite applications to support business scenarios. Composite applications are

programs that utilize enterprise services to blend functionality from multiple applications, even if the applications use different databases, programming languages, or operating systems.

Once the underlying software is service enabled and linked by composite applications, the information necessary for student life-cycle management flows seamlessly across organizational and system boundaries. And because all enterprise services are published in a central enterprise services repository, they are available to everyone who needs them, including partners, suppliers, supervisory agencies, and other participants in the academic ecosystem.

With ESA, a change or exception entered at any point in the student life cycle is reflected automatically at all other points in the life cycle. With relevant information at their fingertips, administrators become more productive, faculty members spend less time on paperwork, and senior officials can improve existing methods and procedures. For example, if administrators decide to link additional processes to existing student life cycle processes – such as online registration, evaluation of equivalency credits, e-learning, or alumni-oriented activities – the applications supporting these processes can be integrated quickly, without elaborate and costly programming.

Here are some other examples of how ESA enhances higher education and research processes:

- Program administrators can build composite applications to manage grants. As internal and external stakeholders gain a unified view of interrelated activities, you can link and improve processes like planning, budgeting, monitoring, and reporting.
- Groups of schools or colleges – whether allied informally or part of a unified federal or regional system – can use strategic sourcing techniques to jointly manage demand planning, contract negotiation, and fulfillment for everything from paper clips to the most sophisticated scientific equipment.

- Using an integrated application, an intellectual property manager who wants to review the status of a patent or copyrighted product can drill down to access lab notes, licensing agreements, and royalty figures – even though the relevant data resides in several otherwise incompatible systems.

ESA Delivers Key Benefits for Higher Education and Research

Many academic organizations rely on diverse legacy and specialized third-party systems. Replacing or upgrading these solutions is problematic due to budget constraints and technical complexities. An ESA-powered IT landscape allows you to compose new applications on top of existing software, increasing the value of your current systems and enabling new processes.

With ESA, you can:

- **Leverage IT assets to improve flexibility and achieve organizational goals**
You can envision and plan composite applications based on strategic or tactical goals – without having to reprogram or replace underlying IT assets to support the proposed initiatives. Using predefined enterprise services that link to existing functionality, business analysts can compose new applications using a model-driven approach.
- **Build innovative processes**
You can deploy user-centric solutions that result in highly responsive, easy-to-use services that benefit students, faculty, researchers, and employees. With new applications that can be developed in-house, by SAP, by third-party providers – or a combination of all three – you can improve processes to lower costs, deliver better service, and improve efficiency.
- **Collaborate with internal and external partners**
ESA supports collaboration among departments, schools, regulators, and suppliers, helping public and private institutions achieve higher levels of integration and teamwork. This ultimately improves the quality of teaching, research, and service, while allowing senior officials to retain visibility and control critical processes.

■ **Improve security and minimize risk**

In addition to making it easier to fulfill legal regulations and protect highly sensitive data, ESA enables you to separate the definition of interfaces and processes from the underlying applications. This results in faster implementations and more cost-effective upgrades, deployed as needed. ESA supports incremental, step-by-step improvement – without the interruptions associated with big-bang implementations.

Making a Difference

ESA combines the reliability and comprehensive functionality provided by SAP® applications with the flexibility of services based on open standards. Leveraging the SAP NetWeaver® platform, ESA enables the seamless integration of SAP, legacy, and third-party software into composite applications that enhance key processes. With ESA, SAP helps blend technology with business content, providing a business process platform that helps academic and research institutions save time and money while transforming service for all stakeholders.

Learn More

To learn more about how ESA can help your organization meet the current and future challenges of higher education and research, please call your SAP representative or visit us on the Web at www.sap.com/netweaver.

Powered by SAP NetWeaver

Enterprise services architecture is powered by the SAP NetWeaver platform. SAP NetWeaver unifies technology components into a single platform, allowing organizations to reduce IT complexity and obtain more business value from their IT investments. It provides the best way to integrate all systems running SAP or non-SAP software.

SAP NetWeaver also helps organizations align IT with their business. With SAP NetWeaver, organizations can compose and enhance business solutions rapidly using enterprise services. As the foundation for ESA, SAP NetWeaver allows organizations to evolve their current IT landscapes into a strategic environment that drives business change.

SAP NetWeaver also powers the SAP for Higher Education & Research solution portfolio, the SAP xApps™ composite applications, and SAP partner solutions. Designed for interoperability with a wide range of operating systems, development languages, middleware, and business applications, it allows educational and research institutions to take full advantage of existing IT assets, integrating all systems running SAP or non-SAP software. SAP NetWeaver also helps improve process efficiency, providing a substantial level of integration, automation, and consolidation for key activities like procurement, training, and financial management.