



## Business Case

**Project Name:** Develop and Implement the Enterprise Application Integration (EAI) Infrastructure

**Channel:** CIO

**Project Sponsor:** CIO

**Project Lead:** Ganesh Reddy

Describe the need for change (the business problem to be addressed).

The modernization of the Student Financial Assistance (SFA) delivery systems requires that information flow reliably, efficiently and timely to all points of need. Some of the challenges to achieving integration in OSFA's current environment are:

- A costly and cumbersome set of legacy systems
- Many custom built, point-to-point interfaces between systems that are difficult to update and maintain
- Multiple hardware/software platforms
- The fact that changes to one application can affect all interfaces to/from that application
- Having no centralized management, visibility of information flows, and business rules
- The need for one integrated architecture

The fourth chapter of the Modernization Blueprint describes OSFA's business process flows and technical system architectures for all business functions. It describes the modernized information architecture and identifies key business processes and subprocesses and high-level subject areas. It also maps the Modernization Blueprint identified subject areas against "hairball" databases. The Blueprint identifies systems and subsystems across the OSFA enterprise while laying a foundation for target architecture required to support the Information Architecture. The main purpose of the information architecture is to build a high level Modernized Student Financial Aid Management (SFAM) information architecture, which governs all of the Blueprint's levels (I thru IV). The main function of SFAM is to perform all OSFA business activities comprising of five areas, which are Student Services, School Services, Financial Institution Services, Performance Management, and Enterprise Services.

What is the purpose of the initiative?

This development and implementation of the Enterprise Application Integration (EAI) Infrastructure includes the Integrated Technical Architecture build, will be the technical foundation that will enable Modernization Program's re-engineered business processes and systems improvements. The Integrated Technical Architecture will provide a standardized, reusable infrastructure for enabling business capabilities by enabling SFA to reduce the number of custom-built, stove-pipe applications that are difficult to update and maintain. Specifically, the Integrated Technical Architecture build will facilitate Internet, EAI, Data Warehouse, and Security architectures/services.

What is the scope of the initiative, including what it is not?

The project includes:

- Evaluating legacy systems and conducting network analysis
- Develop technology infrastructure detailed design for Internet, EAI, Data Warehouse, and Security architectures
- Procuring hardware/software for the initial build of Integrated Technical Architecture



- Installing and configuring the products and services for Internet, EAI, Data Warehouse, and Security architectures.
- Conducting software installation verification
- Testing the Integrated Technical Architecture build.

Included in the scope of this initiative is to build and test the following technical architecture services, touch points and integration:

- Internet Architecture Components:
  - Firewall -Web Server – Firewall (DMZ)
  - Web Server – LDAP Server
  - Web Server – Application Server
  - Web Server – Search Engine
  - Content Management Server
  - Application Server – DBMS Server
  - Application Server – MQ Series (Integration with EAI services)
- EAI Architecture Components:
  - MQ Series – Application Server
  - MQ Series – IBM Workflow
  - MQ Series – IBM Integrator
- Data Warehouse Architecture Components:
  - ETL (Extract, Transform, Load) technical services
  - End-User-Access services to the Enterprise Data Warehouse (sample/test model)
  - Enterprise metadata repository (for the decision support architecture).

What is the start date and end date of the initiative?

The proposed start date of this project is 4/1/00 and the projected end date will be 10/1/00.

What other business areas/external groups are affected by the implementation of this initiative and how are they affected?

The EAI software will reduce the burden on existing legacy systems as new technology is implemented in SFA. Much of the current interface burden will migrate from the legacy systems to the interface software. The software includes pre-built adapters that can be re-used as interface requirements change. To configure these adapters, the EAI team will need to gather technical specifications, data formats and business rules from the legacy systems. PriceWaterhouseCoopers and CSC have already documented much of this under prior system efforts.

What systems are impacted by the implementation of this initiative and how are they impacted?

There will be no initial changes to current systems as a result of the Integrated Technical Architecture implementation. However the Integrated Technical Architecture will be the technical foundation that will enable future Modernization Program's re-engineered business process and systems improvements.

What business processes are impacted by the implementation of this initiative and how are they impacted?



There will be no initial changes to current business processes as a result of the Integrated Technical Architecture implementation. This initiative will facilitate the exchange of data among legacy systems. Over time, the Integrated Technical Architecture implementation will facilitate introduction of new business processes and systems.

**Technologies Used**

The following proposed technologies will be used to implement this project:

Name/type	Proposed use	Has technology been used at SFA before? Where?	Does Technology fit SFA's Architecture Standard? Explain.	Does SFA have the technical expertise to implement this technology? Why?
Enterprise Application Interface platform and tools.  IBM's MQSeries  MQSeries Integrator  MQSeries Workflow	MQSeries messaging for integration of applications, data, and processes.  MQSeries Integrator to provide a powerful message broker solution - to transform, route, store and retrieve the messages.  MQSeries Workflow to accelerate process flow, optimize costs, eliminate errors and improve workgroup productivity.	No	Yes. <ul style="list-style-type: none"> <li>• Modernization Blueprint (pg. 8 in 9/99 version)</li> <li>• Capability Release Plan</li> <li>• Modernization Partner deliverables</li> <li>• Architectural Release Plan (deliverable 4.1.4)</li> <li>• Recommended Application Architecture Standards (deliverable 4.1.2)</li> </ul>	Yes, but only with contracting support.  In house support can be developed over time.



**Benefits**

This business case will prove that new services can be provided for OSFA’s customers and partners through the use of new technology, improving the way information is shared and managed. This is in response to the old “hairball” systems that only hampered activities and provided out-of-date service.

<b>Reduce Unit Cost</b>		
<b>Quantified Benefit (\$)</b>	<b>How will benefit be measured/realized?</b>	<b>When will benefit be realized?</b>
<p>Reduce costs associated with development and maintenance of SFA systems. Gartner group sources, articles, and case studies show that 30% of development expenditures go to building interfaces, savings from EAI (up to 60% over a period of time).</p> <p>\$7,800,000 benefit (\$52M annual development budget * 15% savings)</p>	<p>Measured in the realization of benefits vs. existing maintenance contracts for SFA systems.</p> <p>Realized when there is an ability to integrate an environment composed of disparate, best of breed applications including a large number of legacy and custom applications that have evolved in silos over time.</p>	<p>As existing systems are reengineered or migrated to the integration architecture (see architecture release plan 4.1.2 and capability release plan v2.0 for timeframes)</p> <p>9-12 months (see appendix for references)</p>
<p>Increase automated electronic exchange of information between SFA and students, schools, and financial partners.</p>	<p>Manual processing and paperwork are significantly reduced, lowering costs and the number of resources required to support the processing of financial aid information.</p>	<p>As customer self-service options become available As systems are migrated to the integration architecture, reduction in resources to support interfaces of existing systems</p>
<p>Convenience, real time access, data consistency, reduced points of contact, data integration, angle POC</p>		
<p>SFA’s development and maintenance training costs will be reduced</p>	<p>EAI tools will enable SFA to focus on obtaining technical skills in a single technology tool versus having to manage a broad set of capabilities across a wide spectrum of custom integration solutions.</p>	<p>12 months</p>
<b>Assumptions</b>		
<ul style="list-style-type: none"> <li>30% factor is the Gartner estimate of redundant interfaces. This analysis uses a lower figure, 15%, to take a conservative approach.</li> </ul>		



<b><i>Increase Customer Satisfaction</i></b>		
<b>Quantified/Qualitative Benefit</b>	<b>How will benefit be measured/realized?</b>	<b>When will benefit be realized?</b>
Convenience, real time access, data consistency, reduced points of contact, data integration, single point-of-contact for information.		
Availability of information from a number of complex heterogeneous applications also empowers SFA to provide effective customer self-service, improving customer satisfaction.	Feedback from customers (students, schools, financial partners) Increased customer self-service options	As existing systems are reengineered or migrated to the integration architecture (see architecture release plan 4.1.2 and capability release plan v2.0 for timeframes)
EAI tools will improve business processes for delivering information to customers (students, schools, financial partners) and enable effective collaboration with partners who also serve SFA's customers	Reduction in time of end-to-end business processes	TBD
Improvements in sharing information with partners will increase the speed at which SFA can provide their customers access to accurate and timely data.	Automating business processes, reduction in time of end-to-end business processes	6 months after initial implementation
<b><i>Assumptions</i></b>		

<b><i>Increase Employee Satisfaction</i></b>		
<b>Quantified/Qualitative Benefit</b>	<b>How will benefit be measured/realized?</b>	<b>When will benefit be realized?</b>
Easier maintenance of interfaces with legacy allows business managers to make more changes to their systems, quicker interfaces (See Pg 29 of Del 4.1.2)	Lower contractor costs	



Enablement of customer self-service through integration architecture to answer routine questions will free up SFA employees to provide more value-add services to students	TBD	As customer self-service options become available
Access to the right data at the right time	The Integration Architecture can provide key, decision making information from disparate systems to users--what they want, when they want it. Furthermore, redundant efforts to gather and report information can be avoided.	As existing systems are reengineered or migrated to the integration architecture (see architecture release plan 4.1.2 and capability release plan v2.0 for timeframes)
<b><i>Assumptions</i></b>		

Estimated overall dollar amount of all benefits listed above.

<b>Quantified Benefits</b>					
<b>BY</b>	<b>BY+1</b>	<b>BY+2</b>	<b>BY+3</b>	<b>BY+4</b>	<b>Total</b>
\$0	\$7,800,000	8,112,000	8,437,000	N/A	24,349,000
<b><i>Assumptions</i></b>					
<ul style="list-style-type: none"> <li>Growth in Development budget is assumed at 4%</li> </ul>					



**Costs**

Provide costs, including those to implement the initiative and the costs to support it over its useful life.

COSTS (000s)						
	FY00	FY+1	FY+2	FY+3	FY+4	Total
<b>Development</b>	\$7,460	0	0	0	0	\$7,460
<b>Operations</b>						
<b>Prod. Proc</b>						
<b>Key Pers.</b>	\$40	\$150	\$156	\$162	\$169	\$ 677
<b>Ad Hoc</b>						
<b>Sys. Maint.</b>	0	\$72	\$72	\$72	\$72	\$ 288
<b>Telecom.</b>						
<b>Data Center</b>						
<b>Sub. Ops</b>						
<b>Total</b>	\$7,500	\$222	\$228	\$234	\$241	\$8,425
<i>Assumptions</i>						
<ul style="list-style-type: none"> <li>• Key personnel costs assumed 4% inflation per year</li> <li>• System maintenance costs estimated at 18%</li> </ul>						

**Total Cost of Ownership**

What is the level of required enhancement after implementation?

There are no required enhancements after implementation unless the source of the interface changes or if expansions and upgrades are requested. Other than these examples, all annual basic operations and maintenance upgrades are incorporated in changes from the source systems.

What is the life span of this initiative?

The strategic core component of the architecture is positioned for a long-term life span of 5 to 10 years unless a decision to create an overriding architecture is made. If this decision is implemented then its life will be less than its originally determined life span.



**Alternatives**

Discuss what could be done in place in this initiative and describe the consequences of each alternative.

Alternative	Consequence
Remain as-is	<ul style="list-style-type: none"> <li>• SFA continues with existing legacy interface systems and maintenance challenges</li> <li>• Attempts to leverage new technology with old existing legacy systems will only clog and aggravate existing interface problems and infrastructure deficiencies</li> <li>• Restricts ability of SFA to meet business requirements of customers</li> </ul>
Non-technology solution- - re-engineering business process/outsourcing	Not applicable, unless existing hardware does exist
Enhance an existing system	Continue with legacy interface systems and maintenance challenges
Implement on a smaller scale	<ul style="list-style-type: none"> <li>• Existing pilot consists of three interfaces for one application</li> <li>• SFA could build one interface for one application but this would not demonstrate the value of the enterprise architecture</li> <li>• It would not demonstrate the reuse of the existing architecture as well</li> </ul>
Continue Highway 1 and Access America pilots.	The knowledge capital obtained from the pilots may not be useful in designing the eventual Origination and Disbursement system solution.

**Risks**

Risk	Description of Risk	Mitigation Strategy
Financial	Project takes longer than expected, thus driving up labor costs	<ul style="list-style-type: none"> <li>• Make sure contractors have a clear scope and a well defined project plan</li> <li>• Use a performance based financial relationship and/or fixed price bids</li> </ul>
Technology	<ul style="list-style-type: none"> <li>• Company goes out of business</li> <li>• Technology may not be appropriate for all systems/applications</li> </ul>	<ul style="list-style-type: none"> <li>• Contractors will be using proven technology developed and provided by industry leaders</li> <li>• System will be evaluated by SFA</li> </ul>
Scope	Try to solve all problems at once	Maintain focus on one application at a time
Management	Buy-in from business stakeholders (channels)	It must be seen as a strategic architecture component
Exposure	Hardware and software delivery	Coordination of time frames and schedules



### Schedule/Milestones

This process has a number of steps must take place in order to integrate across all OSFA systems including:

- Analyzing and addressing the problems stated in the first section of this business case
- Having CIO adopt the pilot as part of the going forward strategy and EA capability release plan
- Evaluating legacy systems and conducting network analysis
- Procuring hardware/software
- Designing, building, and prototyping technical architecture
- Initially installing and configuring the architecture
- Testing the architecture
- Piloting an initial business capability

It is through these means where an EAI will be set-up and used as an integration tool between SFA and outside servers.

#	Milestone	Start Date	End Date
1	Legacy system and network analysis	Week 1	Week 6
2	Hardware and software procurement	Week 1	Week 6
3	Initial product and installation and configuration	Week 6	Week 12
4	Design and prototype technical architecture	Week 2	Week 13
5	Build and test technical architecture	Week 10	Week 21

