

FSA Integration Partner

United States Department of Education

Federal Student Aid



**Data Strategy Enterprise-Wide
Technical Strategies Team
123.1.11 External Information
Access (FSA Gateway) Strategy**

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Executive Summary

An important enabler of delivering financial aid to students is the interaction that must take place between the Federal Student Aid (FSA) organization and its trading partners such as schools, lenders, guaranty agencies, servicers, and other government agencies. The information obtained from these exchanges is necessary in order to accurately account for and distribute financial aid. This External Data Exchange Strategy addresses the future of interactions between FSA and its trading partners.

At FSA there are many ways in which communication takes place with the external community. Examples range from schools utilizing the Student Aid Internet Gateway (SAIG) to facilitate communication with FSA, students modifying their demographic information via the students portal, paper promissory notes mailed as part of the application process, and defaulted borrower information compiled on tapes and sent to FSA. For the majority of the external data exchanges that take place, there is little standardization with respect to file types, content, and connectivity methods. This results in both maintenance and data consistency issues between trading partners and FSA.

The purpose of the External Data Exchange Strategy is to review options for FSA to improve the overall efficiency of its communication and data exchange with trading partners. In order to accomplish this, consideration has been given to current industry trends for trading partner data exchange as well as best practices.

To develop this strategy, the Technical Strategies team collected business objectives, identified gaps and developed options in conjunction with key FSA stakeholders to enable the future vision for external data exchange. Each of these options was then reviewed and compiled into an overall External Data Exchange Strategy. Below are the prioritized business objectives defined by FSA that relate to external data exchange:

Rank	Business Objective
1.	Standardize external exchange of commonly referenced data through a single, virtual, secure FSA gateway to simplify communication with FSA.
2.	Enable access to key business services for the external community.
3.	Right-time exchange of necessary data with trading partners.
4.	Clarify, communicate, and enforce data access standards with external trading partners.

External Data Exchange Business Objectives

External Data Exchange Recommendation

The recommendation for external data exchange is to implement a single, virtual entry point known as the FSA Gateway through which the majority of trading partner interaction can take place. The goal of the FSA Gateway would be to simplify trading partner interaction with FSA through the consolidation and standardization of trading partner interfaces. Rather than having to maintain multiple proprietary interfaces with FSA internal systems, trading partners



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would maintain interfaces with the FSA Gateway, which would handle data and service interaction requests.

The implementation of an FSA Gateway is an approach for the organization to improve its interaction with external trading partners. Key recommendations with respect to the FSA Gateway are as follows:

- Implement the FSA Gateway as an external system access point to FSA services.
 - Enable trading partners to discover FSA capabilities by consolidating information and providing uniform access.
 - Provide data exchange status and information to trading partners and FSA.
- Provide right-time access to FSA data and business functions.
 - Utilize Web services to provide real-time access to data and services.
 - Support XML-based forms of real-time data exchange.
 - Support batch methods of data exchange.
- Leverage standard data formats in data exchange.
 - Use common data definitions for data exchange and validation.
 - Enable data consistency through the use of Core Components.
 - Standardized data formats used between external systems and FSA by leveraging XML.
- Integrate with existing FSA capabilities and other initiatives.
 - Leverage data transformation and business process services provided by the Internal Integration Services.
 - Incorporate with Trading Partner Management and security efforts to enable uniform communication between FSA and trading partners.

Centralized management and governance of the FSA Gateway would allow for the development and enforcement of data exchange standards, which is key to improving the overall quality of data exchange with trading partners. Additionally, the FSA Gateway concept will provide the foundation for centralized communication of FSA capabilities to the trading partner community.

Implement the FSA Gateway as an external system access point to FSA services.

The FSA Gateway provides an entry point to the data exchange capabilities that are available internally to FSA (Internal Integration Services). The FSA Gateway would provide FSA and its trading partners with the ability to track data exchange that takes place across enterprise boundaries. In addition, the FSA Gateway should provide a repository (possibly a Web site) for the discovery of FSA service capabilities to ensure that trading partners can locate and access FSA capabilities with minimal support.



Provide right-time access to FSA data and business functions.

The FSA Gateway must provide trading partners with right-time access to data and services. Initially, support for all existing forms of data exchange should be provided. This would likely evolve with the future capabilities of FSA trading partners to a state where a much smaller subset of data transport methods and formats would be supported. Batch data exchange would be centralized at the FSA Gateway, and Web services would be leveraged to provide real-time interaction to trading partners. This approach would serve to reduce the number of interfaces that must be maintained between FSA and its trading partners.

Leverage standard data formats in data exchange.

It is recommended that data exchanges with trading partners be built as XML messages, defined in XML schemas that leverage Core Component definitions. This would serve to ultimately reduce the complexity of data exchange with trading partners by providing a standard set of definitions for data, a reference point for designing exchanges, and continuity across fields and formats applied for data exchange. Additionally, using XML schemas that leverage Core Components would provide a basis for validation as simple message format errors could be detected at the FSA Gateway, thereby reducing the processing load on internal FSA systems. System and field-specific logic should be avoided at the FSA Gateway.

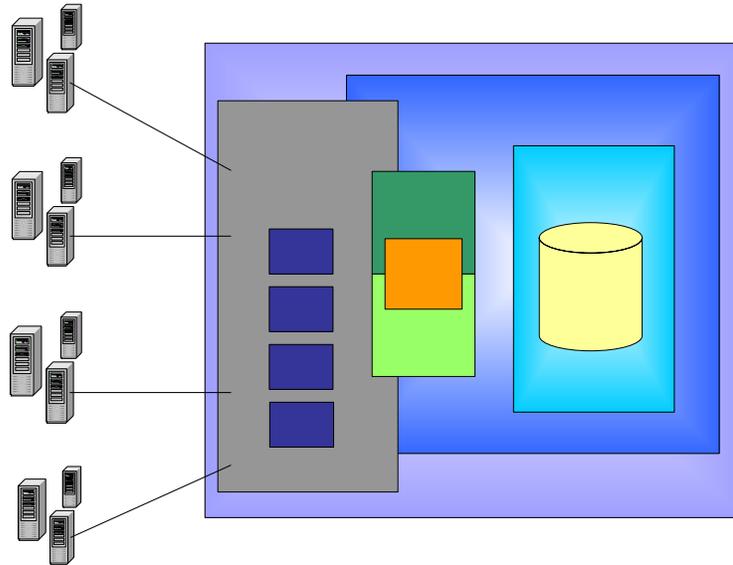
Integrate with existing FSA capabilities and other initiatives.

The FSA Gateway could provide access to FSA data and services for trading partners. As such, it only makes sense that integration between FSA and its trading partners be centrally managed. To help realize this integration, consistent approaches to both Trading Partner Management (TPM) and security are needed.

TPM would allow the oversight and viewing of trading partners across all student aid lifecycle phases through the implementation of a Routing Identifier (RID) that would uniquely categorize FSA trading partners. This integration is important in that it can provide the basis for governance of trading partner processes such as enrollment into the FSA services and oversight into funding eligibility and compliance. The FSA Gateway would serve as an enabler for external exchanges that are a large part of the TPM processes.

Building upon TPM, the FSA Gateway would work with the security framework and access management capabilities to provide the appropriate levels of security to external transactions. The Gateway would be the external system access point for the trading partner community and leverage those capabilities for use across FSA. It is important to note that the FSA Gateway would not build out its own security, enrollment, and access architecture, but rather leverage existing FSA-wide capabilities. Collectively, these would provide the foundation for enabling trading partners to do business with FSA in a more consistent manner.

In addition to extending TPM capabilities, the FSA Gateway could leverage resources provided by the Internal Integration Services. It could extend services such as data transformation, business process management, and standardized error handling to interactions that take place with trading partners. The following illustration depicts the concept of the FSA Gateway:



FSA Gateway Concept

Trading

FSA Gateway Benefits

The overall business benefits that FSA can achieve by implementing the FSA Gateway include:

- Simplifying trading partner data exchange.
 - Reducing the number of direct system-to-system connections that must be maintained with trading partners.
 - Minimizing impact of changes on FSA's trading partners.
 - Making FSA data and services available through a centrally managed location.
 - Providing ability to uniformly market capabilities to trading partners.
 - Providing increased visibility into trading partner data exchange.
- Meeting trading partner desires for right-time data exchange.
 - Enabling increased capabilities for real-time data exchange externally.
 - Supporting existing data exchange requirements.
- Reducing the number of different data exchange formats.
 - Simplifying trading partner interaction with FSA.
 - Increasing data quality.
- Reducing effort required for integration within FSA.
 - Building capabilities once and deploy across the enterprise.
 - Reducing overall architecture complexity.
 - Leveraging existing capabilities.

Government
Agency
Systems

School
Systems



**Data Strategy Enterprise-Wide
Technical Strategies
External Information Access
(FSA Gateway) Strategy**

Next Steps

The External Data Exchange Strategy will be combined with strategies from the other four technical areas to represent a comprehensive Technical Strategy that is in alignment with the overall FSA Data Strategy effort. The collective picture and the required implementation steps will be outlined in the Technology Vision and Strategic Plan (123.1.12), Data Framework Technical Specification (123.1.4), and Quality Assurance Strategy and Implementation Plan (123.1.5). These documents will serve as the enablers of the high-level Data Strategy business objectives.

In preparation for the delivery of the Technology Vision and Strategic Plan (123.1.12), working sessions will continue to be conducted with key FSA stakeholders through October as part of the effort to develop the Technology Vision and Strategic Plan, which will be delivered in mid-November.



**Data Strategy Enterprise-Wide
Technical Strategies
External Information Access
(FSA Gateway) Strategy**

Amendment History

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1 Introduction

1.1 Purpose

The purpose of the External Data Exchange Strategy document is to outline options that could help FSA reach its external data exchange vision. This document will expand on the current state and business objectives related to external data exchange as captured in the Technical Strategies Statement of Strategic Focus (123.1.6), by clearly documenting options that can be used to fill gaps that exist between the current and target states. This External Data Exchange Strategy will be combined with strategies from the other four technical areas to represent a comprehensive Technical Strategy that is in alignment with the overall FSA Data Strategy effort. The collective picture and the required implementation steps will be outlined in the Technology Vision and Strategic Plan (123.1.12), Data Framework Technical Specification (123.1.4) and Quality Assurance Strategy and Implementation Plan (123.1.5). These documents will serve as the enablers of the high-level Data Strategy business objectives.

1.2 Background

The Department of Education's Federal Student Aid (FSA) organization is seeking to deliver overall improvements in the areas of data exchange and management. The goal of implementing improvements to the flow and consistency of data exchange is to ensure that FSA complies with regulations set forth by oversight organizations in support of the program-wide goals, which include maintaining a clean audit and ensuring exclusion from the General Accounting Office (GAO) high-risk list.

The purpose of the FSA Enterprise-Wide Data Strategy is to define FSA's enterprise data vision and strategy for how it will combine the tools, techniques and processes, documented in the FSA Data Strategy Framework, to handle its enterprise data needs. The effort to improve data exchange with trading partners is one of five technical strategies that when combined with the strategies for Data Framework, XML Framework, Common Identifiers, and Enrollment and Access Management initiatives comprise the overall FSA Enterprise-wide Data Strategy. The technical strategies in addition to External Data Exchange include Internal Data Exchange, Web Usage (Portals), Web Services and Data Storage, Management, and Access. Each of these strategies have or will be addressed in separate documents, but were considered during the development of the overall External Data Exchange Strategy.

In order to create the overall External Data Exchange Strategy for FSA, the current state of external data exchange at FSA was compiled and validated with key business owners. The current state was then used as a basis for a series of seven business objective gathering sessions from which detailed business objectives with respect to the five technology areas were gathered from FSA businesses across the student aid lifecycle.

Approximately 200 raw business objectives were gathered for each of the technical strategies key areas. These business objectives were then refined, consolidated, and prioritized by FSA business owners in a series of consensus meetings. The business objectives and associated gaps



between the objectives and the current state of technology at FSA were gathered and presented through the Technical Strategies Statement of Strategic Focus (123.1.6).

This document details how improvements to external data exchange capabilities can help FSA achieve the business objectives that were set forth in the Technical Strategies Statement of Strategic Focus.

1.3 Scope

The goal of this strategy document is to provide options for FSA's vision to improve data exchange capabilities between FSA and its trading partners. The strategies associated with each of the five technical areas will later be combined in the Technology Vision and Strategic Plan (123.1.12) to present an overall technical strategy along with a road map for achievement. The key items that this document will present include:

- An overview of the external data exchange current state with respect to business objectives.
- Detailed options assessment to outline enabling the future state of external data exchange.
- Analysis of each option, which includes positive and negative impacts
- Recommendation on solution components to improve external data exchange.

1.4 Assumptions

The following assumptions have been factored into the scope for the External Data Exchange Strategy:

- Although there is tangible value that can be achieved in the short term, FSA's external data exchange vision includes characteristics that may need a three to five year timeframe to implement in order to fully achieve the organization's business objectives.
- Since the time of the original business objective gathering sessions, additional projects have been identified as having an impact on the Technical Strategies and FSA's future state. As appropriate, these efforts and other potentially relevant efforts will be assessed for impact during subsequent Technical Strategies deliverables.
- Only external data exchanges are considered. External exchange is defined as data moved between FSA and its contractor owned systems to trading partners. Data exchanges that only occur between internal FSA systems were covered in the Internal Data Strategy (123.1.9).
- Considerations have been made that account for the future direction of Internal Data Exchange, Web Usage, Web Services, XML Usage, and Data Storage, Management, and Access.
- Real-time data exchange refers to an exchange of data that triggers a series of events across multiple systems as soon as reasonably possible. Real-time capabilities are dependent on the response capabilities of supporting systems.



1.5 Business Objectives and Gaps

As part of the effort to develop FSA’s strategy with respect to external data exchange, a series of meetings were held with business owners from separate phases across the financial aid lifecycle to gather business objectives. In order to address improvements to external data exchange at FSA, these business objectives were then consolidated and prioritized in a set of consensus meetings and captured in the Technical Strategies Statement of Strategic Focus (123.1.6). These objectives then served as the primary input for the overall external data exchange vision.

The themes reflected by the business owners include the desire for more standardized forms of data exchange with trading partners, increased the amount of real-time data exchange, and allowing trading partners to access key FSA business services. The focus of this strategy is to present assessments of technical options that may be used to fill the gaps associated with the identified business objectives. These gaps and associated business objectives are outlined in the table below:

Rank	Business Objective	Percent Realized	Gaps
1.	Standardize external exchange of commonly referenced data through a single, virtual, secure FSA gateway to simplify communication with FSA.		<ul style="list-style-type: none"> Limited use of standardized, open exchange formats. Common identifiers for students and schools are not utilized for data exchange with trading partners. Multiple independently managed entry points into FSA systems.
2.	Enable access to key business services for the external community.		<ul style="list-style-type: none"> Some in-demand FSA business services are not provided to trading partners. Existing access does not accommodate standard, open data exchange formats. No consolidated mechanisms in place for accessing FSA business services.
3.	Right-time exchange of necessary data with trading partners.		<ul style="list-style-type: none"> Some legacy systems cannot handle real-time exchange. Most data exchange with trading partners occurs via manual or batch processes. Data format is not optimized for light-weight right-time transactions.
4.	Clarify, communicate, and enforce data access standards with external trading partners.		<ul style="list-style-type: none"> Some data standards exist, but are not consistently enforced. No formalized communication of standards between FSA and its trading partners.

Table 1.1 - External Data Exchange Current State Gap Analysis



1.6 Key Decisions Points

Based upon the business objectives and gaps that were identified in the previous section, a series of key decision points were established and refined by cross lifecycle business owners. The purpose of these decision points is to provide guidance in developing options and ultimately a solution recommendation.

- **How many points of data exchange with the FSA environment are needed?**

Data exchange today occurs through a number of varied system managed points and in diverse formats. Going forward, how many points of data exchange should FSA maintain with the external community? How will trading partners establish and maintain exchange relationships with FSA?

- **What data formats and standards should FSA support when exchanging data with trading partners?**

Many different file types and data formats are currently exchanged between trading partners and FSA. Should FSA attempt to standardize file formats used in data exchange with trading partners?

- **What data transfer methods with trading partners will FSA support?**

FSA currently supports many different transfer methods to facilitate data exchange with trading partners. These methods range from specialized forms of file transfer used in the SAIG to tape and even paper-based forms. As part of a longer term vision should FSA attempt to reduce the data transfer methods used in trading partner exchange?

- **How will FSA manage and communicate external data exchange capabilities with trading partners?**

A common theme necessary to enable improved data exchange with external trading partners is effectively communicating FSA data exchange capabilities to all trading partner groups. How should FSA improve its communication and marketing capabilities?

1.7 Assessment Criteria Methodology

In an effort to assess each option effectively, the business owners established a set of assessment criteria. These criteria should be used with the business objectives and key decision points in order to determine each option's true value to FSA.

This set of rating criteria was applied to enable the consistent comparison of options to one another so that it is readily apparent as to which option best serves FSA's future needs. The results of this comparison serve as the basis for determining what the overall technical strategy recommendation is going forward.



The following assessment criteria were used to evaluate each option:

Business Process Impact – Does the option have the potential of introducing significant cross-lifecycle business process improvements?

Flexibility – Does the option offer improved flexibility for external data exchange? Can the option support both existing legacy systems and potential future systems?

Level of Effort – Will significant effort (time and resources) be required to realize this option? Will the amount of effort required to enable data exchange with trading partners be reduced?

User Impact – Will the end user experience improvements with this option?

1.8 Subject Matter Expert Utilization

The following Subject Matter Experts (SMEs) were leveraged during the creation of the External Data Exchange Strategy:

1. Jonathan Hill, Enterprise Integration Expert – Accenture Global Business Solutions.



2 Communication with Trading Partners

In order to deliver financial aid to borrowers, FSA must maintain relationships and interact with many different external trading partners. These interactions are a crucial aspect of FSA's business as financial aid decisions are often made based upon data and information from entities outside of FSA. Examples of FSA trading partners include schools, lenders, guaranty agencies, servicers, and other government agencies. When examining FSA's ability to effectively communicate with external entities, consideration should be given to how trading partners will access FSA data and services, as well as how access points are governed and marketed to trading partners.

2.1 The FSA Gateway Concept

In addition to filling the information needs of citizens and other internal systems, the President's E-Government initiative challenges government agencies to enable improved sharing of data with other agencies as well as third-party trading partners. This initiative holds significant implications for FSA as it currently maintains many different points of data exchange with government agencies such as the IRS, SSA, and INS as well as third-party entities such as guaranty agencies, lenders, servicers, and schools.

One challenge facing FSA today is the number of different data exchange points that are maintained with its trading partners. For example, approximately 5,000 schools, 20 lender servicers, and fewer than 100 GA's perform batch data transfer through the FSA Student Aid Internet Gateway (SAIG) while other trading partners such as lenders and other government agencies may use a variety of electronic and even manual means to perform batch data exchange with a single internal FSA system. Across the many data transfers, the manner in which common data is exchanged is not standardized. For example, student or school information may be captured and exchanged differently across multiple FSA external exchanges.

Enabling an FSA Gateway is a way to simplify and improve data exchange capabilities and information access between FSA and its trading partners. The FSA Gateway is a single, virtual entry point that can be utilized by external trading partner systems to access services and information that reside within the FSA environment. It is possible that this virtual entry point could contain multiple connectivity options to support different types of data transfer methods and support a wide range of data formats. For example, FSA has expressed interest in increasing capabilities for external real-time data exchange, but batch forms of data exchange may be more appropriate for some business functions. Consequently, the FSA Gateway would have to support different levels of batch and real-time data exchange.

The FSA Gateway would allow use of a standardized set of data exchange capabilities between FSA and trading partners and would be supported as a single entity eliminating many of the current external communications maintained to multiple back-end systems. Rather than maintaining direct connectivity with multiple FSA internal systems as is done in today's environment, trading partners could simply maintain a single interface to FSA via the FSA



Gateway. Simplification of external communications via the FSA Gateway could likely provide the following benefits:

- A uniform front to the external community for FSA connectivity.
- Reduced integration costs for both FSA and its trading partners.
- Simplified maintenance and support requirements.
- Improved data sharing capabilities across different phases of the student aid lifecycle.

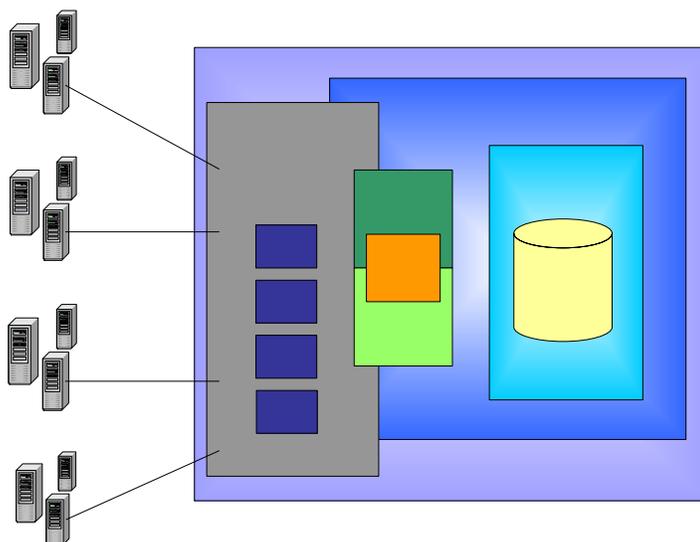


Figure 2.1 - FSA Gateway Concept

2.2 Marketing External Data Exchange Capabilities

The FSA Gateway would allow FSA to market its exchange and services capabilities to FSA trading partners more uniformly. Similar to the marketing effort required for Web services, effective communication of FSA's external data exchange capabilities is vital to ensuring that both FSA and trading partners benefit fully from any external data exchange capabilities that are in place.

To external trading partners, FSA currently appears as collection of loosely related system-specific interfaces. In today's environment, trading partners typically know how to connect to a specific FSA system in order to perform a single business function. For example, guaranty agencies connect directly to SAIG to receive Institutional Student Information Records (ISIRs) from the Central Processing System (CPS). In addition, guaranty agencies maintain separate connections to other systems such as the Financial Management System (FMS) for some Forms 2000 submissions via FTP as well as tape exchanges with the Debt Management and Collection System (DMCS) for skip tracing. The different file formats and transport methods often pose maintenance challenges for both FSA system owners as well as trading partners.

Trading



Rather than trading partners connecting to multiple FSA systems, they could simply be directed into the FSA environment through the FSA Gateway. This uniform approach to external data exchange would simplify the external data exchange process for trading partners as well as FSA. FSA could establish and make available a set of connectivity solutions, thus providing a uniform front to the external trading partner community.

It is essential that changes and additions to the FSA Gateway's capabilities be effectively communicated with external trading partners. For instance, external parties must be notified of changes to data formats, maintenance windows, and interfaces to prevent unexpected service interruptions. Options for communicating service changes include leveraging various FSA portals, Frequently Asked Questions (FAQs) pages, email notifications, and even written memos. The communication is critical as it much convey a unified and consistent message with respect to external connectivity to the trading partner community. Without effective communication of FSA Gateway capabilities, realization of the benefit of such a consolidated connectivity could be compromised.

2.3 Governance of External Data Exchange Capabilities

A key aspect of the FSA Gateway concept is the ability to have centralized and uniform management of external data exchange capabilities. Today, each point of data exchange between systems is managed by the individual FSA system owners whose systems serve a specific phase of the student aid lifecycle. SAIG has taken the first step toward data exchange consolidation by serving as the gateway for some batch transfers. The diversity in exchange management has resulted in a variety of exchange methods and formats across FSA.

A uniform approach to external data exchange governance is typically helpful to improve data exchange capabilities between FSA and its trading partners. While the concept of the FSA Gateway better lends itself to a centralized governance approach, input from and coordination with business owners and trading partners across different phases of the student aid lifecycle is required to ensure that all needs are met.

The following concepts should be taken into consideration when developing an enterprise-wide approach to enabling external data exchange:

- Alignment with the Trading Partner Management (TPM) effort which includes the Routing Identifier (RID) and Enrollment and Access Management components.
- Increasing data exchange consistency through the creation and adoption of a uniform set of external data exchange standards.
- Implementing an enterprise-wide set of security standards that trading partners must adhere to when exchanging data with FSA.
- Providing a centralized support location for trading partners.
- Implementing a change control process to enable effective interface versioning across the enterprise.
- Creating and applying user and system roles along with defined access levels.



3 How can the FSA Gateway enable business capabilities in the Future?

Today, FSA maintains relationships with many different trading partners who often interact directly with FSA internal systems through numerous proprietary interfaces. The high number of interfaces, different transport methods and file formats utilized for external data exchange, present many challenges both for FSA and its trading partners. For example, maintaining many different types of interfaces with multiple FSA systems places significant burden on trading partners at a time when some trading partners, such as schools, are struggling with maintaining their own IT infrastructures. Additionally, the different file formats required for particular interfaces also lead to confusion, data inconsistencies, and increased maintenance costs for both the trading partners and FSA.

In addition to the challenges faced by trading partners, FSA itself is faced with many obstacles when dealing with external data exchange. Today, no automated business process coordination takes place between trading partners and FSA or between FSA internal systems. This has led to many data inconsistencies across different phases of the student aid lifecycle as different systems manipulate data. Additionally, spreading external interfaces across multiple FSA systems has resulted in inconsistent error reporting, varied levels of support, and a reduced ability to effectively track data from trading partners. Another challenge includes effectively communicating its full range of capabilities and services to the external community as this responsibility now lies with each individual system owner.

The FSA Gateway has the potential to alleviate many of these problems as well as enhance existing services by enabling capabilities that do not currently exist, such as real-time data exchange and business process orchestration with trading partners. In addition, the FSA Gateway can improve overall service between FSA and its trading partners by:

- Providing a single, virtual location for trading partners to interact electronically with FSA.
- Making key FSA business services centrally accessible to many members of the trading partner community.
- Centralizing and standardizing the communication, maintenance, and support of data exchange capabilities that support enable external business services.
- Facilitating business processes between trading partners and the FSA student aid lifecycle by providing a centralized point of access to FSA.
- Reducing impact to trading partners by decoupling internal FSA systems from the trading partner interfaces.

The following sections will illustrate how some existing FSA business processes could be improved by the FSA Gateway concept. The business processes that will be covered include performing credit checks through external credit bureaus as well as the enrollment status update process that currently takes place between the National Student Loan Data System (NSLDS) and multiple trading partner groups.



3.1 Credit Checks

In an effort to ensure that financial aid is reaching qualified individuals, a series of credit checks take place as part of the loan origination and disbursement and consolidation processes for PLUS borrowers. Credit checks are requested in batch format by the Common Origination and Disbursement (COD) system after the ISIR is received, or schools initiate their own credit checks via a Web page on an individual student basis. These requests are sent to a third party credit verification service, which communicates directly with the national credit bureaus. The following figure illustrates the origination and disbursement credit check process:

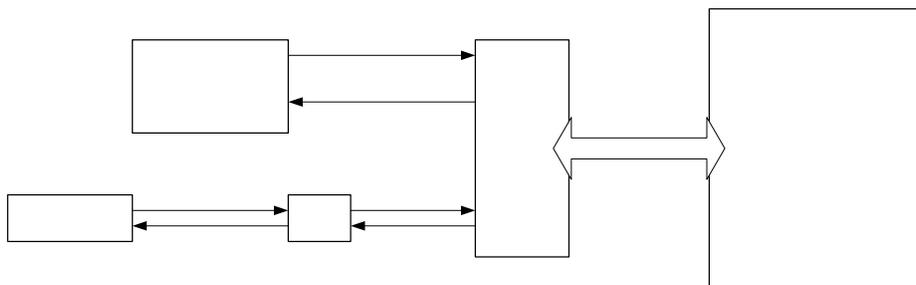


Figure 3.1 - Current Origination and Disbursement Credit Check

The Direct Loan Consolidation System (DLCS) makes a similar credit check as part of the loan consolidation process. DLCS performs credit checks through a daily batch request to a different external vendor known as a surveyor. The surveyor then obtains credit information for each PLUS borrower contained in the batch and returns a batch of credit check results to DLCS. Both of the batches to and from the surveyor take place via FTP. The following figure illustrates this interaction:

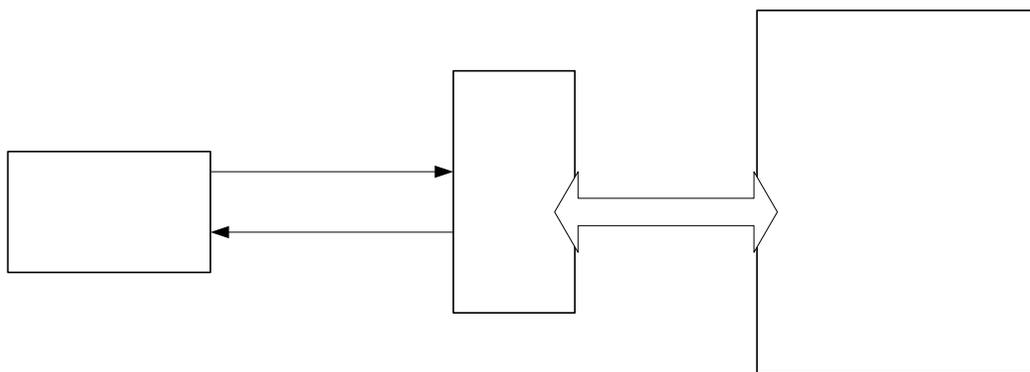


Figure 3.2 - Current Consolidation Credit Check

While these examples demonstrate similar processes, it is important to point out several key aspects of these two credit checks with respect to data exchange with trading partners. First, different processes and even different external vendors are used to perform the same function



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across the delivery and servicing lifecycles of the student aid process. In addition to simply being a duplication of effort and resources, data consistency could be impacted if conflicting data is returned by each process for the same borrower or applicant.

Another key consideration with both of these credit check options is that different transfer frequencies and methods are employed. While the origination and disbursement version supports both batch transfers via FTP and ad-hoc requests via the Web, the credit check process used for consolidation only supports batch transfer via FTP. It is also important to note that the data formats utilized in each process are likely not the same as different external vendors and lifecycle phases are in play.

The FSA Gateway could enable internal FSA systems to uniformly access credit check functionality as a single service or set of services as the data architecture evolves. For instance, credit check capabilities could be centrally enabled such that real-time checks could be performed through Web services with a Web-based front-end, while batch support could be provided when large numbers of checks must be made at a single time. This approach would allow for the credit check provider to change, if necessary, with minimal impact to FSA systems, easy connectivity of other FSA systems credit check capabilities if necessary, and a single, centralized standard credit check support offering for FSA system owners.

A single external trading partner could be leveraged to perform credit checks with the major credit bureaus. This would serve to reduce costs as well as data inconsistencies that are associated with performing credit checks. The following figure illustrates how the FSA Gateway concept could improve the existing credit check process:

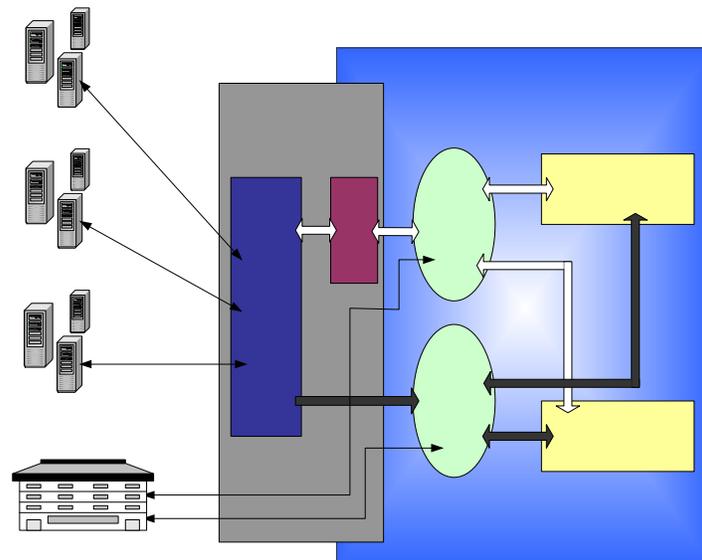


Figure 3.3 - Proposed Credit Check via FSA Gateway



3.2 Student Enrollment Status Updates

In order to ensure that FSA and its trading partners have the most up-to-date student enrollment status information, several exchanges of data take place between FSA, schools, guaranty agencies and lenders. It is vital that FSA and trading partners maintain correct student status to ensure that services are provided appropriately. For instance, if a student recently graduated from a given institution, their status with FSA and trading partners must accurately reflect this status change to ensure that the account enters repayment within six months as mandated by law.

The current process for maintaining correct student enrollment status involves both internal FSA systems (NSLDS and Direct Loan Servicing System [DLSS]) as well as multiple groups of trading partners including schools, guaranty agencies and lenders. This is known as the Student Status Confirmation Report (SSCR) process. Schools update student enrollment data in NSLDS as required by law or whenever a student's enrollment status changes. Guaranty agencies and lenders use enrollment information provided by NSLDS to determine when a student graduates or withdraws.

The following diagram illustrates the SSCR process as it happens at FSA today:

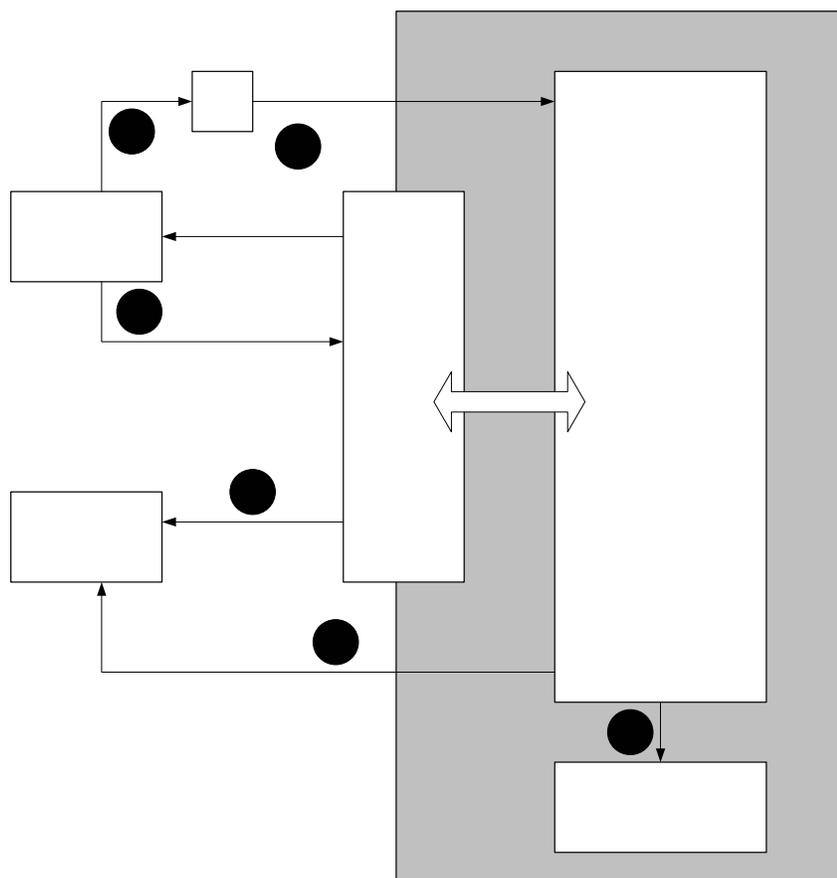


Figure 3.4 - Current SSCR Process



As illustrated in the above diagram, the current SSCR process includes a mix of both real-time and batch transfers (flat file, tape, etc.) that take place through a variety of means including SAIG, FTP, and Web-based interface. Each of the interfaces associated with external data exchange has a set of different requirements with respect to file format and transfer frequency. The net result is that many different connections are maintained between external trading partners and NSLDS. FSA as well as its trading partners must support and maintain each of these interfaces to ensure correct processing of FSA data.

The FSA Gateway has the potential to simplify the overall SSCR process through the consolidation and standardization of the interfaces that it could offer to the external trading partner community. For instance, the FSA Gateway could route requests from each of the trading partners to a set of services specifically designed to retrieve and update student enrollment status from NSLDS. These services would need to encompass the following functions:

Service	Description
Update Status	
Real-time Service	Provides real-time post updates for individual students.
Batch Service	Provides roster response and bulk update capabilities for all students.
Retrieve Status	
Real-time Service	Retrieves an individual student's information for student lookups or eligibility screening in real-time.
Batch Service	Retrieves lists of Guaranty Agencies' students as well as match lists.
Compliance	
Compliance Service	Ensures that schools comply with providing enrollment status updates based upon legislation mandates.

Table 3.1 - Proposed Enrollment Status Update Services

The following diagram illustrates how external trading partners may update and retrieve student enrollment information through the FSA Gateway:

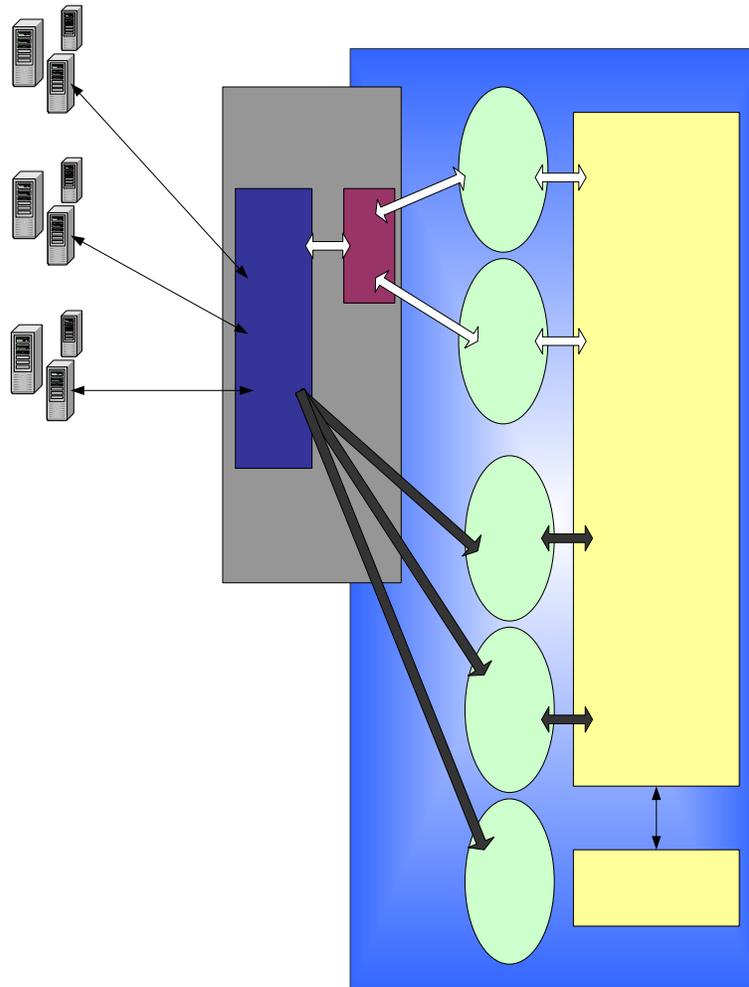


Figure 3.5 - Proposed Enrollment Status Update via FSA Gateway

3.3 Option Assessment

The following tables present assessments of how the FSA Gateway will impact business processes, flexibility, level of effort, and users at FSA:

Business Process Impact	Does the option have the potential of introducing significant cross-lifecycle business process improvements?	 Negative Business Process Impact Positive Business Process Impact
Points		Comments
	FSA Gateway provides a platform for business process integration with trading partners.	<ul style="list-style-type: none"> FSA Gateway utilizes business process management services of the Internal Integration Services. Business process integration with trading partners can reduce complexity of data exchange.
	Supports a phased approach to trading partner integration.	<ul style="list-style-type: none"> Reduces implementation impacts as trading partners migrate as it makes business sense. Continues to support existing connectivity.



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Business Process Impact	Does the option have the potential of introducing significant cross-lifecycle business process improvements?	 Negative Business Process Impact Positive Business Process Impact
	FSA and trading partner business processes may require modification.	<ul style="list-style-type: none"> Business process changes may be required by both FSA and trading partners to adapt to new process capabilities. Some trading partners may not be capable of integrating business processes.

Table 3.2 – FSA Gateway Business Process Impact Assessment

Flexibility	Does the option offer improved flexibility for FSA connectivity? Can the option support both existing legacy systems and potential future systems?	 Not Flexible Highly Flexible
Points	Comments	
	Increased data exchange flexibility.	<ul style="list-style-type: none"> Allows for relatively seamless sharing of data with trading partners. FSA Gateway supports many data formats. FSA Gateway has the capability to support legacy systems. FSA Gateway provides support for different file transport technologies.
	Improved capability to integrate new trading partners with FSA.	<ul style="list-style-type: none"> The centralized nature of the FSA Gateway makes connectivity to FSA less complicated. Standardized data format and content reduces complexity of data exchange.
	FSA Gateway increases data exchange options for trading partners.	<ul style="list-style-type: none"> Support for multiple data exchange methods. Trading partners can choose integration options based upon the evolution of their capabilities.

Table 3.3 – FSA Gateway Flexibility Assessment

Level of Effort	Will significant effort (time and resources) be required to realize this option? Will the amount of effort required to maintain connectivity to FSA be reduced?	 Significant Effort Required Minimal Effort Required
Points	Comments	
	Reduces effort to connect to FSA for many trading partners.	<ul style="list-style-type: none"> FSA Gateway provides standardized means of trading partner connectivity.
	Reduces maintenance effort for FSA and trading partners.	<ul style="list-style-type: none"> Centralization of trading partner data access allows for the consolidation of maintenance and support efforts. Decoupling of trading partner interfaces from FSA internal systems minimized impacts to trading partners when FSA internal systems change.
	Effort potentially required by trading partners to connect to the FSA Gateway.	<ul style="list-style-type: none"> Initially, some trading partners may have to modify interfaces to support connectivity to the FSA Gateway.

Table 3.4 – FSA Gateway Level of Effort Assessment



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User Impact	Will the end user experience improvements with this option?	 Negative Impact to User Positive Impact to User
Points	Comments	
 Trading partner interaction with FSA may be simplified.	<ul style="list-style-type: none"> Business process automation capabilities simplifies roles of trading partners. Increased visibility will reduce effort required to troubleshoot transactions. 	
 Increased levels of customer service.	<ul style="list-style-type: none"> Transaction tracing simplifies reconciliation and troubleshooting processes. Centralized customer support provides a single location for trading partners to receive data exchange assistance. Tight integration with FSA will increase self-service capabilities for trading partners. 	
 Adoption of new business processes may be required.	<ul style="list-style-type: none"> Users will likely have to adopt modified business processes that support tighter integration with FSA. 	

Table 3.5 - FSA Gateway User Impact Assessment

Score Summary

Business Process Impact	Flexibility	Level of Effort	User Impact
4	5	4	4

Table 3.6 - FSA Gateway Assessment Scoring



4 Data Exchange Formats

Standards are an integral part of external communication throughout the commercial world and in government. Adhering to a standard data format and content definitions for data exchange has the potential to minimize confusion. This will increase data quality and reduce maintenance costs associated with reconciliation of varied data formats.

Data format determines how information is structured in order to move between systems. The Technical Strategies Statement of Strategic Focus (123.1.6) and the As-Is System Data Flows (123.1.2) outlined the various data formats that are currently utilized for external data exchange. There are a variety of formats used for external exchange such as XML-based and flat file-based exchange that are used between schools and COD.

4.1 Standards

FSA format standards for external data exchange are currently being developed based on the Electronic Business using eXtensible Markup Language (ebXML) guidelines, as well as the Universal Business Language (UBL) guidelines from the Organization for the Advancement of Structured Information Standards (OASIS).

Exchanging information with third party vendors and trading partners is a part of the business model for both government and the commercial world. Therefore, FSA could leverage the higher education community and the financial services industry as possible points of alignment in further development of their standards.

Like the financial services industry, FSA's business deals with financial transactions and loans; therefore, it would seem logical that data format standards used in the financial services industry that have been tested and refined under real-world could be leveraged in the student aid process. Examples of data exchange format standards currently used in the financial services industry include:

- The Financial Information eXchange (FIX) protocol – developed as a messaging standard for the real-time electronic exchange of securities transactions.
- swiftML – developed by the Swift organization to aid in the messaging services to banks, broker-dealers and investment managers, as well as to market infrastructures in payments, treasury, securities and trade.
- MISMO XML – developed by The Mortgage Industry Standards Maintenance Organization (MISMO) in order to cover secondary pooling delivery transactions, underwriting, mortgage insurance application, and real estate service request processes. MISMO deals with key industry players, such as Freddie Mac and Fannie Mae.

Due to the unique nature of the student aid process and FSA's interaction with its trading partners, the vast majority of FSA's data exchange is different than that handled by the above standards. The limited applicability of financial services industry standards leads one towards aligning with higher education in general. Over time, a dictionary could be incorporated that



includes those elements, rather than aligning with the financial services industry. The XML Core Components Dictionaries (123.1.15) establishes enterprise definitions of key data that is exchanged within FSA's student aid lifecycle.

4.2 Core Components

Data content standardization is an important part of the goals that support FSA's vision to improve external communication with trading partners. The goals include the need for providing common data elements and to standardize the methods and formats utilized for data exchange between FSA and external trading partners, while considering the external partners' restrictions to any extensive changes to current procedures.

FSA can utilize Core Component definitions for both internal and external data exchange. The difference between external exchange and internal exchange is that, internally, FSA has greater freedom to change and modify formats, the limitation being the cost and impacts to FSA maintained systems. Externally, the same constraints exist and are supplemented by the desire to minimize impacts to trading partners and maximize the ability to do business quickly and efficiently. When dealing with the external community, there may also be political implications associated with changes that need to be taken into consideration.

Leveraging FSA's Core Components when creating XML messages for exchange with external partners will provide consistency in the data transferred and in the quality of the interfaces developed. Over time, data consistency will minimize any ambiguity associated with trading partner data exchange. For example, the representation student demographic information in the COD Common Record will be consistent with the representation of the same information in the XML ISIR, based on the Core Components Dictionary. The commonality in their representations will help minimize the misinterpretation or misapplication of rules surrounding student data across interfaces.

In addition, Core Components provide a basis for validation through the definition of data content standards. As data is being transferred to FSA from various external partners, it must be verified to fulfill data requirements for FSA's internal systems and processes. Data validation can be a significant contributor to improved data quality. Validation conducted at or near the point of exchange has the capability to improve data quality throughout the business process and thus decrease operating cost. The level of validation that occurs must be addressed to not impact performance and prevent system business logic from residing in the FSA Gateway. However, simple checks on the validity of file width or correctly formed schema can minimize failures when the data is received downstream by internal FSA systems.

A part of the Data Strategy initiative is to use XML schema entities to describe commonly referenced data. Core Component definitions have been created for data elements that exchange data as part of the student aid lifecycle. In the case of a data element that is not shared with any other systems, Core Components may not have to be utilized. If such a data element may be used between systems in the future, then Core Components should be leveraged to reduce the need for future data transformation.



The FSA Core Components are based on the ebXML and UBL guidelines referred to previously. FSA Core Component definitions will be published and housed in the Registry and Repository for use in XML-based external data exchange. The key business entities' attributes have specific meaning in XML, but may also be leveraged for flat file interfaces. This will help avoid complexity with regards to data transformation and redundancy. Further information with respect to Core Components can be found in the XML Core Component Dictionaries document (123.1.15).

4.3 XML

The XML Framework Strategic Assessment and Enterprise Vision (123.1.13) outlined the XML Framework as an underlying component of the overall FSA Data Strategy solution. Currently, XML represents a small percentage of the external electronic data transfers by FSA. XML allows for the definition and validation of data content and structure, along with providing the following benefits:

- XML is hierarchical, thus able to represent more complex relationships than flat file (parent-child).
- Reduces complexity of information sharing due to nesting capability and repeatability of XML blocks.
- Using supporting technologies like XML schema, advanced relationships can be defined between XML blocks that are not possible to represent in standard flat files.
- XML supports automated data validation where flat files require customized logic. XML schema defines the file content and provides format details such as fields, and characters type (alphanumeric, etc.). XML schema validation is thus an efficient and cost-effective data validation alternative.

Although many external partners currently may not have XML capabilities, there are efforts underway to make XML the standard for data exchange among the external community. One community organization, the Postsecondary Electronic Standards Council (PESC), is a national organization representing a partnership of schools, higher education associations, federal agencies, and software and service providers that promotes standards for data sharing. PESC has established an XML Forum for Education, an industry group focused on developing XML standards appropriate to education, and providing the community with information on XML applications and their potential. Another example is the National Council of Higher Education Loan Program (NCHELP). NCHELP is a nationwide network of external partners, such as lenders and schools, which are involved with the administration of the Federal Family Education Loan Program (FFELP). NCHELP actively promotes and develops interfaces and applications that leverage XML formats to improve accessibility and interoperability among the participating partners.

Gartner's Hype Cycle for XML assesses the maturity of XML technology over a 10-year horizon and beyond. According to the document, XML's "time to plateau/adoption speed" will take "less than two years." The justification for this is that "many applications at many levels of the



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IT 'stack' and in many vertical industries have used XML for at least five years." The article goes on to say that XML's business impact areas are that it can "improve interoperability and enable cross-industry interchange."¹

XML is becoming a prevalent technology and is currently being utilized as a data exchange format among some federal agencies that exchange or plan to exchange data with FSA. For example, the IRS e-file system uses XML for electronic submission of tax forms. The Social Security Administration utilizes XML to establish a common electronic process for federal and state agencies to collect, process, analyze and verify and share birth and death record information. Although these government agencies are currently capable of generating and utilizing XML, it is important to note that FSA is not currently exchanging XML with them.

XML can be utilized for both real-time and batch transfer when supported by legacy systems. For example, with the COD Common Record, batch data can be transferred via an XML file format, while the future implementation of the CPS ISIR will use XML for real-time updates. The use of XML for data exchange provides several advantages over traditional flat file formats, such as schema validation.

A concern often associated with the use of XML is its size. Because XML files contain information about the data fields within the document it is often larger than the same data in a flat file format. Evaluation of each interface must be done to assess the impact of moving from current formats to XML, while weighing the benefits outlined above against the impacts of size. The design and implementation of real-time transfer may help to minimize the impacts of utilizing XML, because real-time transfers are typically smaller in size than batch transfers.

COD receives Pell Grant and Direct Loan origination and disbursement data from institutions via the XML Common Record. XML has been selected as the data format for the Common Record due to its better modeling capability and the pervasiveness of the technology. It can provide COD and schools with flexibility by allowing the transfer of Pell, Direct Loan, or both in the same file format, in addition to originations, disbursements, and changes.

The ISIR is produced by CPS, which is sent to schools after a student completes and submits a Free Application for Federal Student Aid (FAFSA). The ISIR contains the original student data, the expected family contribution (EFC) calculated by the CPS, results of the student eligibility check, and any inconsistencies identified through the CPS edits. Currently, a flat file format is being utilized for the ISIR, although XML has become the format of choice for the similar reasons of validation and efficiency described above. An XML schema has been developed for the ISIR (deliverable 123.1.18), but has not yet been implemented.

As outlined in the Web Services Strategy (123.1.8), XML is the document format standard for Web services. XML is necessary to exchange business services via the Web services capability. By utilizing an XML format early, FSA can lay the foundation for transitioning to a service-based architecture.

¹ © Gartner, Inc. Source: "Hype Cycle for XML Technologies, 2003", 30 May 2003.



External data exchange will need to support many message formats initially. It may not be appropriate to implement XML across all external trading partners, especially those that may have technological limitations. In cases where trading partners are utilizing a flat file format, data transformation may be necessary to convert to an internal FSA standard. Current FSA data transformation capabilities can provide an opportunity for external data transformation with minimal impact to the trading partners. Data transformation will involve converting flat file data entering the FSA enterprise from external partners into an XML format that will then be delivered to FSA internal systems. As technical capabilities evolve, the ability to support new formats like XML should be more prevalent in the external community, thus minimizing the need for transformation over time.

Using the XML Technical Reference and Usage Guidelines (123.1.14) as a basis for future XML development, will ensure that the community has a common XML standard as well as a starting point of reference for support. The Technical Reference and Usage Guidelines will provide a day-to-day, working-level guide for practitioners and managers. The stated goal of the Technical Reference is to facilitate adherence to FSA's XML standards by making the material easy to understand and implement.

4.4 Option Assessment

The following tables present assessments of how a standardized format such as XML Core Components will impact business processes, flexibility, level of effort, and users at FSA:

Business Process Impact	Does the option have the potential of introducing significant cross-lifecycle business process improvements?	 Negative Business Process Impact Positive Business Process Impact
Points	Comments	
👍	Core Components can standardize data formats.	<ul style="list-style-type: none"> A standard data format reduces maintenance costs for reconciling data in various formats such as with data transformation.
👍	Core Components can reduce data ambiguity and improves data quality.	<ul style="list-style-type: none"> Reduces any need for checking and rework during the process as a result of misinterpretation. Defining future interfaces between trading partners and FSA can be simplified through the application of Core Component definitions.
👍	Trading Partners can adopt Core Component definitions and file formats over time.	<ul style="list-style-type: none"> Data transformation capabilities of the internal integration layer can allow trading partners to connect more easily with the FSA Gateway.
👎	Not all FSA and trading partner currently support XML formats.	<ul style="list-style-type: none"> Business process changes may be required by both FSA and trading partners to adapt to new technologies supporting formats such as XML.

Table 4.1 - XML Core Component Business Process Impact Assessment



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Flexibility	Does the option offer improved flexibility for FSA connectivity? Can the option support both existing legacy systems and potential future systems?	 Not Flexible Highly Flexible
Points	Comments	
👍	Core Components can be leveraged for legacy flat file or new XML formats.	<ul style="list-style-type: none"> Allows FSA to maintain connectivity with external legacy systems while allowing opportunity for future XML interaction. While intended primarily for XML, Core Component principles can be applied to flat file formats in order to standardize content.
👍	The application of Core Component definitions increases re-use of commonly defined data that is exchanged between FSA and its trading partners.	<ul style="list-style-type: none"> Minimal transformation logic will be required when Core Components are utilized. Data definitions are standardized between FSA and its trading partners.

Table 4.2 - XML Core Component Flexibility Assessment

Level of Effort	Will significant effort (time and resources) be required to realize this option? Will the amount of effort required to maintain connectivity to FSA be reduced?	 Significant Effort Required Minimal Effort Required
Points	Comments	
👍	Core Components and XML formatting allow for standardized interface development.	<ul style="list-style-type: none"> Interface modeling can be simplified through Core Component usage.
👍	Reduces maintenance effort surround data clean up or data quality.	<ul style="list-style-type: none"> Core Components allows for standard data format so that less effort is needed for maintenance or data clean up.
👎	Effort required by FSA to implement data transformation methodology.	<ul style="list-style-type: none"> Implementing and understanding Core Component definitions will require effort for both FSA and its trading partners.

Table 4.3 - XML Core Component Level of Effort Assessment

User Impact	Will the end user experience improvements with this option?	 Negative Impact to User Positive Impact to User
Points	Comments	
👍	Trading partner interaction with FSA may be simplified and made more efficient.	<ul style="list-style-type: none"> Less confusion or mistakes surrounding sent data through common data definitions will lead to more efficient service.
👍	Increased levels of customer service.	<ul style="list-style-type: none"> By aligning with a standard data format, miscommunication and misinterpretation would be reduced.
👎	Adoption of new business technology may be required.	<ul style="list-style-type: none"> Users will eventually have to adopt technology to support XML data format.

Table 4.4 - XML Core Component User Impact Assessment



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Score Summary

Business Process Impact	Flexibility	Level of Effort	User Impact
4	5	4	4

Table 4.5 - XML Core Component Assessment Scoring



5 Integration Points

The concept of an FSA Gateway is meaningful to the external community, but it will not provide value unless it is capable of integrating and providing access to cross-FSA services. The ability to connect to backend systems and services and manage complex interactions and error cases is critical. Examples of these integration points are:

- Ability to distribute both real-time and batch requests to FSA Systems.
- Access to Data Transformation Services.
- Ability to Manage Complex Business Processes.
 - Error Handling.
 - Multiple system access.

5.1 *Ability to distribute both real-time and batch requests*

A key component of the FSA Gateway is the ability to handle batch exchanges, real-time data exchange and the provisioning of FSA services. The Gateway must be able to handle various types of requests and must be integrated in a manner that supports the varied levels of performance and communication that are required by FSA. The FSA Gateway needs to integrate with the Internal Integration Services to distribute data with FSA internal systems. The integration services include message-based communication and access to Web services. The request can be passed onto the integration services layer where it will be handled and distributed to the downstream systems. The FSA Gateway is a conduit to access the variety of capabilities in the integration services layers. For additional detail about these services, see the Internal Data Strategy (123.1.9).

5.2 *Access to Data Transformation Services*

Data transformation is necessary when dealing with external trading partners that provide data that is in a different format than those being utilized within FSA. For example, large volumes of batch data in flat file format from schools will need to be transferred to XML format as FSA internally evolves towards utilizing XML. Data transformation will have to occur to enable integrity while minimizing impact to the external trading partner systems. An implementation option is to do this transformation at the Gateway; however, this approach was rejected in the business owner working sessions for the following reasons:

- It would require maintaining data transformation logic in multiple places within the enterprise (systems, Internal Integration Services, and the FSA Gateway).
- It could potentially be a performance bottleneck.
- It would require the Gateway to understand internal system formats and conversions.

Based on these considerations, it makes more sense to leverage the transformation capabilities of the Internal Integration Services, which would be established to make common transformations available to any interface that is connecting FSA systems. The Gateway could be thought of as another interface point to the integration services that will leverage the common transformation capabilities.



Leveraging Core Components can minimize transformation both internally and externally. As standards are adopted for the exchanges and data formats evolve, the amount of transformation necessary should decrease.

5.3 Ability to Manage Complex Business Processes

The external community expectations are increasing as the commercial industry's capabilities expand. A trend that will impact the government sector is the desire to move away from system exchanges to more real-time forms of access, Web services, and business services. Similar to data transformation, the ability to discern between the varied types of communication and coordinate the multiple system exchanges necessary to fulfill a request could be housed in the FSA Gateway. However, keeping in mind the simple concept of "build once and leverage often," the integration services layer could be leveraged again to control processes. The specific component of the architecture that would be leveraged is the business process management capability. This provides an intelligent decision-based coordination of requests and can help to take in multiple types of front-end requests that ultimately result in system data exchange. Thus, the FSA Gateway could maintain simple interfaces while accommodating complex requests by updating the business process behind the scenes to provide the end user the services they desire.

The status of data exchanged between FSA and its trading partners can be determined and communicated to the proper parties both within and outside of FSA by tracking the exchange through the FSA Gateway. For example, once a trading partner sends a request to FSA, its status could be tracked and communicated back to the requestor confirming receipt of the data, that the data is currently being processed, and that the transaction was successful. Additionally, trading partners could be notified via email or other means when a regularly-scheduled transaction is not received.

Error handling can also be improved through the reduction of external data exchange points. The FSA Gateway provides an additional benefit as it may serve as a platform for standardizing error handling between FSA and its external trading partners. Currently, there are many system-to-system connections between FSA and its external trading partners and consequently, many different ways of handling errors. When an error occurs during the data exchange process, it is often unclear to the trading partners and to FSA where the error occurred. The FSA Gateway can enable error handling standardization and reduce confusion that is associated with identifying errors. Trading partners could be notified of transaction errors by either a common return message or email. Coupling the FSA Gateway concept with standardized error handling across the enterprise can simplify trading partner exchanges with FSA by minimizing the variety of exchange messages and failures.



5.4 Ability to Manage Relationships with Trading Partners

Trading Partner Management

FSA is seeking to deliver overall improvements in the oversight, management and maintenance of its trading partners (i.e., schools, guaranty agencies, lenders, servicers, state agencies, and private collection agencies). To do so, FSA has developed the concept of Trading Partner Management (TPM). TPM is envisioned as a single solution that will enable FSA to gain a holistic view of its trading partners across the enterprise and provide centralized governance for trading partner processes such as enrollment into the FSA enterprise, access management within the FSA enterprise, and oversight of funding eligibility and compliance.

Routing Identifier

The Routing Identifier (RID) is an important part of TPM. When FSA conducts external exchange with any of its trading partners, the particular trading partners need a unique identifier. FSA will need to know which external partner is in contact with them and what authorization they have at the organizations or user level. Therefore, a RID will be assigned as a unique identifier to trading partners; specifically, any entity that directly conducts business with FSA. The RID can aid in audit trails when tracking data being exchanged with external trading partners, along with the validation of user and system data.

Centralization via the RID will lead to a standardized data format for a common identifier when dealing with external trading partners. In this way, RID works into the standardization effort to help create a cost-effective and efficient data exchange process. All data exchanged outside of FSA will include a trading partner's RID, could become a field within a transferred file; therefore it may be given future consideration for integration into the Core Component standard.

Client-side Software

Another consideration with respect to managing relationships with trading partners is whether or not client-side software will be needed to facilitate data exchange via the FSA Gateway. In today's environment, software is deployed to the trading partners in order to enable some forms of batch data exchange. Examples of client-side software that is in used today include the EDConnect, EDEExpress, and DataPrep clients used in data exchange with FSA.

The EDConnect client provides security, data compression, and connectivity services that help enable trading partners to exchange data with FSA through SAIG. The EDEExpress client provides an easy means for trading partners to manipulate and generate data exchanged with FSA. The DataPrep client performs similar functions, but also includes logic that is capable of detecting differences between batches and submitting only modified records.

While client-side software does present benefits such as standardizing compression and connectivity services, it can add additional effort as FSA must actively maintain software versions and deployments with all of its trading partners. In order reduce the need to maintain



software deployments, consideration should be given to alternatives such as the use of Web browser plug-ins as well as readily available industry standard tools.

5.5 Integration with Other Initiatives

In addition to the Trading Partner Management, a meaningful FSA Gateway implementation must integrate with other related initiatives. Below are examples of such initiatives:

- **Enrollment and Access Management** – To control access to FSA resources, the FSA Gateway should leverage the capabilities of Enrollment and Access Management. This would ensure that systems are granted consistent levels of access to enterprise resources and are consistently managed during any transition to the FSA Gateway concept.
- **Standard Student Identification Method (SSIM)** – While the FSA Gateway would not necessarily implement the SSIM, it could serve as a point at which to apply high-level validation to enable data quality capabilities.
- **XML Framework and Core Components** – A key success factor for the implementation of the FSA Gateway concept is the ability to enable and potentially enforce the format of data exchanged with trading partners. By leveraging Core Component concepts, data transfer between FSA and its trading partners can be made more uniform and ultimately simplified.



6 How will communication with trading partners be secured?

Data exchange between FSA and external trading partners will occur through the single, virtual FSA Gateway. Anytime data exchange goes outside the walls of FSA control, additional security considerations must be made. Privacy is important to both FSA and its trading partners; therefore, security standards around external data exchange should be developed to conform with FSA's *Information Technology Security and Privacy Policy* and ensure that data is being properly delivered to the appropriate systems and entities.

6.1 External Data Exchange Security Considerations

External data exchange has similar security requirements as internal data exchange. There are however, additional considerations with external exchange such as handling sensitive Privacy Act data (SSN and Employment Id Numbers) exchanged between FSA and trading partners over the public Internet, impact of security measures to trading partners, and the necessity to support/secure exchange with a diverse external community. Any recommended external data exchange security standards will need to address the following:

- Authentication – Verification that the trading partners interacting with FSA really are who they claim to be.
- Authorization – Approval and control of access to FSA data and systems based upon an entity authenticated ID.
- Integrity – Verification that data and message contents are received intact and without tampering.
- Confidentiality – Ensuring that data exchanged between FSA and its trading partners is hidden from all except the intended recipient.
- Non-repudiation – Having the ability to undeniably trace a message back to a specific entity as well as ensure transaction content integrity.
- Administration and Management – Having the ability to manage applications and user security services.

Additionally, any security standards developed must take the following points into consideration:

- All solutions for secure transactions should conform to the requirements set forth in the *FSA Information Technology Security and Privacy Policy*.
- Risk analysis must be performed regarding the levels of security applicable for a given situation.
- Security requirements need to be based on the individual system dependencies and the sensitivity of the data involved.
- Varying levels and types of security may be needed to support different methods of transport that are used by the FSA Gateway to enable real-time and batch data transfer.

Gartner defines large trading communities to consist of 50 trading partners or more – a number that FSA far exceeds. For large trading communities such as FSA's, that may have diverse



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security requirements, Gartner calls for "...a combination of two or more business-to business security solutions to secure their transactions..."² Specifically, Gartner outlines options to increase security levels that include Virtual Private Networks (VPNs), Secure Sockets Layer (SSL), digital certificates, or secure HTTP. It is difficult to find a single solution to fit all requirements, therefore FSA should consider accommodating more than one method of securing transactions with external partners.

It is recommended that FSA adopt standards that include different layers of security based upon user and system classifications. This approach will provide the community with more advanced security options and ultimately more secure solutions. It should be noted that different security requirements may exist for batch and real-time methods of transfer. These requirements should be gathered and considered as part of the detailed technical architecture design.

The integrity of communication channels utilized for data transport is vital as FSA exchanges data with external partners via the public Internet. Therefore, data encryption and capabilities to detect information tampering should be in place. The implementation of the FSA Gateway does not change the security considerations FSA has to address today, but rather it allows a more focused point for applying these security considerations.

A simple and effective method of securing communication channels is via SSL for data encryption. SSL is being widely used among groups of various trading partners, in fact, Gartner claims "...through 2008, nearly all trading communities will use SSL to meet diverse trading-partner requirements (0.7 probability)." Communication channel security can also be ensured using SSL in conjunction with VPN connectivity between FSA and trading partners. Gartner also believes "Through 2008, 60 percent of all trading communities will use SSL in addition to at least one other security solution (for example, VPN, AS2, ebMS or WS-Security) to meet diverse trading-partner requirements (0.8 probability)."³

Identity verification is important for both FSA and its external trading partners. External data exchange is a two way process where external trading partners will send and receive data from FSA. Therefore, trading partners will need to be protected from those who may pose as FSA systems in order to gain unauthorized access. Similarly, the FSA needs to protect itself against unauthorized access from external entities falsely posed as trusted FSA trading partners. Solutions such as server side certificates and tokens should be considered for identity verification. As outlined in the Web Services Strategy, access controls should also be implemented as part of the External Data Exchange Strategy in order to limit the access a particular trading partner may have with FSA. As mentioned previously, all entity verification, authentication and access control must follow FSA's *Information Technology Security and Privacy Policy*.

² © Gartner, Inc. Source: "B2B Security Patterns: Finding the Perfect Combination", 7 August 2003.

³ © Gartner, Inc. Source: "B2B Security Patterns: Finding the Perfect Combination", 7 August 2003.



Web services can be accessed through the FSA Gateway; therefore the security considerations that come with leveraging an evolving capability like Web services must be addressed. The Web Services Strategy document outlines the current state of security options for Web services. The summary answer is that Web services can be secured today, however there may be greater effort required now than in the next 1-2 years when the Web service security standards converge.

The E-Authentication Gateway (E-AG) project, which is part of the E-Gov initiative, should be monitored for progress. Still in its early stages of development, the E-AG is headed by the Office of Management and Budget (OMB) and General Services Administration (GSA) and was created in order to centralize means of authentication for government systems. Any FSA authentication solution needs to take into account E-Authentication Gateway efforts, but currently the E-AG's would not provide a solution to meet FSA security requirements. The E-AG is discussed in greater detail in Access Management High Level Design (123.1.29).

The applicability of the E-AG initiative to FSA's trading partners should also be taken into account. The E-AG is targeted at providing public access to government systems. As the E-AG initiative takes hold, FSA should decide whether or not it will support trading partner authentication via E-AG means. This decision may be driven by whether or not FSA is willing to accept credentials issued by another government agency.

6.2 How FSA systems combine to provide Security for External Data Exchange

External data exchange security is not just an interaction between FSA and a trading partner. In the Data Strategy target vision, there are multiple components at FSA that allow trading partner to enroll, access, and manage their exchanges with FSA. For example, FSA's interactions include cooperation between the FSA Gateway and the Enrollment and Access Management component of TPM. Trading partners may leverage FSA's Web Access capabilities to enroll via the TPM solution. This initiates the creation of a Routing Identifier (RID), a unique eight digit number for trading partner identification. The TPM interface can verify the credentials of the trading partner as being in line with required data and eligibility metrics. Once the trading partner is verified, a new RID will be assigned, thus completing the enrollment process.

An important aspect of Enrollment and Access Management is the ability to allow for distributed administration by select trading partners. For example, large institutions that require many users can appoint a Data Point Administrator (DPA) who is granted permissions by FSA to assign users with limited roles. This is done through the Identification Management System. The benefit of allowing institutions to leverage DPAs to grant permissions is that decisions are made by someone much closer to the school's financial aid process. This aligns well with the goals of the FSA Gateway as capabilities are provided directly to the users further simplifying interactions with trading partners.

After external trading partners gain access to FSA services, FSA could then leverage the RID for trading partner identification and potentially for authentication. Additionally, providing the RID as part of a transaction to FSA furthers the concept of common data definitions in that



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trading partners have a means to consistently identify themselves to FSA. Further security verification can be applied (e.g., username/password, etc.) with the RID to expand the security of external exchanges.

Finally, the set of credentials that allow access into the FSA Gateway can be passed along to internal FSA systems where access control decisions can be made prior to executing the requested business process.



7 Recommendation Summary

This recommendation takes into consideration FSA business needs, industry trends, and an understanding of the potential return on investment. The rationale for consideration of this recommendation is the following:

- Improving operational efficiencies.
- Promoting re-use of business functionality.
- Increasing the self-service capabilities.
- Driving integration procedures that best align with business processes.

This recommendation is only one portion of the overall Data Strategy and it takes into consideration FSA cross-lifecycle business processes. The External Data Exchange Strategy requires a thorough understanding of all the components that go into the Data Strategy effort in order to realize its full business value. This approach helps to ensure that the proper considerations have been made with respect to external data exchange across all Data Strategy efforts. It should be noted that no single solution fits all requirements, and furthermore the implementation of a new strategy and architecture requires a carefully planned and iterative approach.

Providing improved data access and service capabilities to trading partners are keys to improving the overall financial aid process at FSA. External data exchange plays a key role in the overall data vision in that it addresses how FSA data and services will be accessed by external trading partners. Based on the evaluation of the key decision questions, the following strategy for external data exchange is recommended for FSA to reach its vision state and achieve its business objectives:

- Enable an FSA Gateway as a single, virtual entry point.
- Implement the FSA Gateway as an external access point to FSA services.
- Provide right-time access to FSA data and business functions.
- Leverage standard data formats in data exchange.
- Integrate with existing FSA capabilities and other initiatives.

By implementing the concept of the FSA Gateway, FSA could realize the following benefits:

- Simplify trading partner data exchange.
- Meet trading partner desires for right-time data exchange.
- Reduce the number of different data exchange formats.
- Reduce effort required for integration within FSA.

7.1 Recommendation Details

To achieve the above benefits and fulfill the outlined business objectives, a number of distinct recommendations should be reviewed. These recommendations, when implemented, represent an overall vision for better enabling the data exchange between FSA and its trading partners



and improving overall trading partner service. A successful implementation of these recommendations would include:

- The majority of data exchange with trading partners takes place via the FSA Gateway.
- The number of custom point-to-point interfaces between FSA and individual trading partners is reduced.
- There is an overall increase in real-time data exchange.
- Data exchanges of like data utilize a common set of data format and content standards.
- Error handling and trading partner notification is standardized.

The following high-level points make up the overall external data exchange recommendation:

- **Enable an FSA Gateway as a single, virtual entry point.**

Enabling an FSA Gateway is central to improving data exchange between FSA and its trading partners. The FSA Gateway should act as a single point of entry through which external trading partners interact with FSA. This would be an improvement over today's environment in that rather than connecting directly to internal FSA systems to exchange data, trading partners would simply connect to the FSA Gateway to exchange data and invoke FSA services. The FSA Gateway would then be responsible for ensuring that data and service requests are handled by the appropriate internal FSA system.

In addition, the FSA Gateway should be centrally managed and governed by FSA. Centralized management and governance are critical to improving external data exchange capabilities, as they would allow for enterprise-wide standards for data exchange to be developed and enforced. The uniform application and enforcement of standards is key to improving the quality of data that is exchange between FSA and trading partners.

The FSA Gateway would also provide the foundation for enabling the centralized communication of FSA data exchange and service capabilities to the trading partner community. This information could be consolidated and placed in a centrally accessible location, which would increase trading partner self-service and likely reduce the amount of support required of FSA by trading partners attempting to access data and services.

The benefits associated with implementing the FSA Gateway as a single, virtual entry point include:

- Decoupling of trading partners and FSA internal systems – changes to FSA systems will have less impact on trading partners.
- Reducing data exchange complexity through the standardization of FSA interfaces.



- Reducing the effort to maintain interfaces between FSA and trading partners as the overall number and different types of interfaces is reduced.
 - Allowing FSA to provide a uniform system access point to the external trading partner community.
- **Implement the FSA Gateway as an external access point to FSA services.**

The FSA Gateway should be implemented as the external access point through which trading partners systems access FSA systems and services. It will act as another component that accesses the capabilities and services provided by the Internal Integration Services.

One important design consideration is how intelligent to make the FSA Gateway. For instance, the FSA Gateway interfaces could be implemented so that they could accept any request and route it appropriately depending upon the format of the request. Another option would be to simply provide trading partners with detailed definitions for each interface and allow them to choose which is appropriate.

In addition, the FSA Gateway should provide a foundation for marketing FSA's capabilities including self-discovery of services to trading partners. When Web services are exposed to trading partners, a centralized repository would allow for trading partners to discover and leverage FSA service capabilities with minimal support from FSA.

The FSA Gateway would also allow for the standardization of error handling capabilities between FSA and its trading partners. A standard set of error codes and messages could be developed and leveraged for all external data exchanges. Once an error occurs, trading partners could be notified of the error via email or error file. This would reduce the complexity currently associated with troubleshooting external data exchanges through the use of a common error handling language.

Benefits of implementing the FSA Gateway as the external access point to FSA services include:

- Reducing the number of direct system-to-system connections maintained by trading partners.
- Providing increased visibility into trading partner data exchange.
- Providing trading partners with the capability to view the status of data exchanged with FSA.
- Ability to consider standardization of error messages and handling between FSA and trading partners.
- Providing increased visibility for trading partners into the end-to-end data exchange process.



- **Provide right-time access to FSA data and business functions.**

A key requirement of the FSA Gateway is to provide right-time access to FSA data and services. Right-time access implies that the FSA Gateway should be capable of supporting data exchange frequencies that are time-appropriate for a particular business situation. This means that the FSA Gateway must be capable of supporting a wide range of data exchange methods and frequencies from infrequent batch requests to real-time Web service invocations that take seconds. The ability of FSA to provide these varied response capabilities is dependent upon the integration architecture supporting communication with FSA internal systems and the ability of the FSA internal systems to generate a response.

Since batch data transfer accounts for much of the data exchange that takes place between FSA and trading partners today, it must be supported for the foreseeable future. The FSA Gateway would provide a centralized location to which trading partners could submit many of their batch requests thus reducing the need for trading partners to maintain as many interfaces with different FSA internal systems. The FSA Gateway would ensure that batch requests are forwarded to the appropriate FSA system via the Internal Integration Services, and that success and failure messages are communicated to the requestor in a standardized manner.

For trading partners that use magnetic tape to facilitate batch data exchange, it is recommended that a phased movement toward batch or real-time data exchange be undertaken. While initially tape transfer must continue to be supported, the long-term goal should be to reduce the number of tape transfers as it makes business sense.

As FSA's trading partners' capabilities expand to enable increased levels of real-time data exchange, FSA must be able to meet these needs. It is recommended that FSA leverage Web services to provide real-time access to trading partners. This would build upon the capabilities presented in the Web Services Strategy (123.1.8) and the Internal Data Strategy (123.1.9) by exposing key FSA services to the trading partner community. For example, a borrower status lookup service could be provided to trading partners, which would enable real-time determination of a student's exact status in the financial aid lifecycle.

According to Gartner Research, Web services are already being successfully leveraged by the National Student Clearinghouse (NSC) to perform student enrollment verification with some trading partners:

“Before making its decision to implement Web services, NSC previewed its proposed solution with some of its trading partners. Most were surprised (and often unaware of the potential for Web services in this role), but, after hearing about the details of the implementation and provisioning process, all were satisfied that it could work and be safe. More recently, NSC polled 50 of its top (by revenue) trading partners, offering to provide Web services automated



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interfaces as an alternative to browser-based access. Of these, 35 have expressed interest in more details, and several will begin testing soon. NSC hopes to have 25 trading partners using Web services by the end of 1Q03.”⁴

Externally facing Web services have provided significant return on investment to organizations that have chosen to implement them. For instance, the level of effort required to develop and expose Web services to the external community is relatively low. In addition, Web services uniformly enable trading partners to self-discover and access services.

Benefits associated with the FSA Gateway providing right-time data access to trading partners include:

- Supporting existing trading partner exchanges in a centrally accessible location.
 - Supporting increased levels of real-time data exchange and service access.
 - Allowing for increased visibility for trading partners into the overall data exchange process with FSA.
- **Leverage standard data formats in data exchange.**

A key requirement of the FSA Gateway is to improve the overall quality of data that is exchanged between FSA and its trading partners through the consistent application of standards in all forms of external data exchange. As proposed in the Internal Data Strategy (123.1.9), it is recommended that data exchange with trading partners leverage Core Component definitions whenever possible.

The FSA Gateway must be able to initially handle data formats of all types from different groups of trading partners. To accomplish this, common data transformation services should be leveraged to ensure that trading partner to FSA communication can take place. However, as FSA moves to a more standardized data exchange format, such as XML, data exchange would be simplified, and over time the amount of data transformation required would be reduced.

Leveraging Core Component principles in external data exchange will provide a basis for initial data validation to be performed by the FSA Gateway itself. The FSA Gateway should ensure that incoming data meets format and content requirements before it is transferred to internal FSA systems for processing. This would serve to catch simple message format errors earlier in the process and would reserve data processing resources on FSA internal systems for more intensive data processing. Field-level validation would still take place at each individual internal system as this type of processing could cause a bottleneck and require system-specific logic in the FSA Gateway.

⁴ © Gartner, Inc. Source: “National Student Clearinghouse’s Web Services Network”, 3 January 2003.



The benefits of leveraging standard data definitions and formats in external data exchange include:

- Reducing the need for data transformation when exchanging data between trading partners and FSA.
 - Reducing ambiguities associated with data exchange in that field definitions and meanings are standardized between FSA and trading partners.
 - Enabling early discovery of data discrepancies through initial validation performed at the FSA Gateway.
- **Integrate with existing FSA capabilities and other initiatives.**

A vital requirement of the FSA Gateway implementation is that it must leverage and build upon principles that are set forth in other FSA initiatives such as Trading Partner Management, which includes Routing Identifier and Enrollment and Access Management components. The main goal of the Trading Partner Management initiative is to do business with FSA trading partners in a more consistent manner.

The Routing Identifier is a key component of the Trading Partner Management initiative in that it will provide the basis for identifying transactions that take place between FSA and trading partners. This will better enable validation as well as enabling FSA systems to produce an audit trail for trading partner interactions.

The purpose of the Enrollment and Access Management initiative is to ensure that trading partners obtain the access they need to FSA information. It will also ensure that trading partners have access only to the data that is necessary to conduct business effectively with FSA.

The FSA Gateway does not own any Trading Partner Management functions. It is simply a provider of exchange services between FSA systems and trading partners. Likewise the FSA Gateway is not the owner of security services, but provides the architecture for implementing required levels of security.

Additionally, the FSA Gateway should leverage and extend the capabilities provided by the Internal Integration Services rather than implementing its own layer of data transformation and business process coordination services. This would serve to reduce the complexity of the external data exchange process. The business process management capabilities of the internal layer would also enable improved capabilities for tracing data flows between trading partners and internal FSA systems. Trading partners could then view the status of data exchanges through a standardized set of tools.

- Allowing capabilities to be built once and leveraged across the enterprise.
- Reducing complexity as data transformation and process logic services are handled by the internal integration layer.



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- Supporting data exchange capabilities of trading partners in that data transformation can be leveraged as necessary to facilitate data exchange with external systems.

7.2 Bridging the Gaps

The following table illustrates how this overall recommendation fills the gaps as derived from the overall external data exchange business objectives:

Business Objective Rank	Gap Description	Fulfilled by Recommendation	Explanation
1	Limited use of standardized, open exchange formats.	✓	FSA Gateway will leverage Core Component definitions and XML for data exchange whenever possible.
	Common identifiers for students and schools not utilized for data exchange with trading partners.	✓	FSA Gateway will provide the means for RID implementation. FSA Gateway could also serve as the point where SSIM is applied.
	Multiple independently managed entry points into FSA systems.	✓	FSA Gateway will provide FSA with the ability to market external data exchange consistently while greatly reducing the number of independent trading partner interfaces maintained.
2	Some in-demand FSA business services are not provided to trading partners.	✓	FSA Gateway will provide means to discover and access FSA services.
	Existing access does not accommodate standard, open data exchange formats.	✓	FSA Gateway will leverage Core Component definitions whenever possible for system-to-system data exchange and facilitate the use of XML.
	No consolidated mechanisms in place for accessing FSA business services.	✓	FSA Gateway will provide centralized service access.



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Business Objective Rank	Gap Description	Fulfilled by Recommendation	Explanation
3	Some legacy systems cannot handle real-time exchange.		In order for FSA to provide real-time exchange, internal FSA systems will need to support real-time levels of response. However, the FSA Gateway will shield trading partners directly from interfaces with legacy systems allowing for a constant front to internal FSA systems.
	Most data exchange with trading partners occurs via manual or batch processes.	✓	FSA Gateway will provide increased capabilities for trading partners to exchange data with FSA in real-time.
	Data format is not optimized for light-weight right-time transactions.	✓	XML better supports light-weight real-time transactions.
4	Some data standards exist, but are not consistently enforced.	✓	Centralized management and governance of the FSA Gateway will provide the foundation for standards creation, publication, and enforcement.
	No formalized communication of standards between FSA and its trading partners.	✓	The FSA Gateway concept provides for the centralization of communications between FSA and its trading partners.

Table 7.1 - Recommendation Gap Bridging

7.3 Alignment with Business Objectives

Fundamentally, technology that improves business process makes sense. However, it is the realization of the business value that supports change from the status quo. The matrix below reviews each of the previously defined FSA external data exchange business objectives. Although an assessment of the gaps should help ensure that the business objectives are reasonably met, a specific review of the business objectives is outlined below to ensure the true business needs are enabled by the strategy recommendations. Explanations of the assessment criteria can be found in Appendix A: Business Objective Accommodation Criteria.



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Rank	Business Objective	Objective Fulfilment	Explanation
1.	Standardize external exchange of commonly referenced data through a single, virtual, secure FSA gateway to simplify communication with FSA.	●	<ul style="list-style-type: none"> • FSA Gateway is the single, virtual interface into FSA. • Data exchange format is standardized through the use of Core Components. • Information exchange with FSA is simplified through a centrally managed access point.
2.	Enable access to key business services for the external community.	●	<ul style="list-style-type: none"> • FSA Gateway will provide the entry point for accessing FSA services. • Web services will be used to facilitate service-based data exchange.
3.	Right-time exchange of necessary data with trading partners.	●	<ul style="list-style-type: none"> • FSA Gateway will support multiple forms of data exchange. • Web services provided the foundation for increased levels of real-time exchange. • Batch data exchange is supported going forward.
4.	Clarify, communicate, and enforce data access standards with external trading partners.	●	<ul style="list-style-type: none"> • Centralized management of FSA Gateway will enable standardization of data transfer and formatting. • Communication of FSA Gateway capabilities will take place in a centralized manner.

Table 7.2 - Recommendation Business Objective Fulfillment



Appendix A: Business Objective Accommodation Criteria

The table below provides a rating scale that explains the measures and criteria used to evaluate how well a particular technical solution satisfies FSA’s business objectives. These indicators appear in the Executive Summary and Recommendation sections with respect to both the current and the recommended states for the External Data Exchange Strategy.

Rating Indicator	Synopsis	Criteria
	Fully Accommodated Objective	The business objective is being completely satisfied.
	Well Accommodated Objective	The business objective is mostly satisfied.
	Partially Accommodated Objective	Some business objective criteria in place, but the business objective is only partially fulfilled.
	Minimally Accommodated Objective	Few parts of the business objective are satisfied.
	Capability Not Accommodated	The solution does not have this element in place and the business objective is not met.

Business Objective Accommodation Criteria



Appendix B: Meeting Minutes - Working Session #1

Date: Thursday, 09/04/2003

Time: 2:00 - 4:00 PM

Location: WDCUDP-C-34D1

Objectives: The objectives of the first working session were to review options for the External Data Exchange Strategy and to decide upon an option or combination of options that will best meet FSA's future needs.

Attendees:

Name	Business/System Area	E-Mail	Phone (Work)	Attendance
Mike Giordano	CSC	Mgiorda4@csc.com	-	Phone
Jeff Goldhirsch	Integration Partner	Jeffrey.c.goldhirsch@accenture.com	202.962.0735	X
Terry Hardgrave	Pearson/CIO	Terry.hardgrave@ed.gov	202.377.3238	X
Denise Hill	FSA/CIO	Denise.hill@ed.gov	202.377.3030	X
Bruce Kingsley	Integration Partner	Bruce.kingsley@accenture.com	202.962.0793	X
Kyle Michl	Integration Partner	Kyle.a.michl@accenture.com	202.962.0750	X
Davis Peden	Integration Partner	Davis.w.peden@accenture.com	202.962.0651	X
Allen Prodggers	DLSS/ED	Allen.prodggers@ed.gov	202.377.3276	X
Marty Winslow	EDS	Marty.winslow@ed.gov	202-377-3023	Phone
Terry Woods	FSA/CIO	Terry.woods@ed.gov	202-377-3023	X

Action Items from Previous Meeting Minutes

N/A

Discussion Points

It was pointed out that decoupling FSA system interfaces from trading partner interfaces with the FSA Gateway will insulate trading partners from FSA system and interface changes. Emphasis should also be placed on retiring outdated transfer methods.

It was recommended that a specific interface group be created to monitor all data transfers between trading partners and FSA. This group would be responsible for detecting problems and resolving all interface issues with trading partners.

It was pointed out that the semantic meaning of batches must be taken into account. For instance, a particular batch of enrollment data from a school may have a special meaning for that individual school.

The following data exchange messages were identified as being necessary to FSA's business:



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- Acknowledgement of data receipt.
- Acknowledgement of data process success.
- Self service check to check the status of a data submission.
- Call center to reach out to trading partners when problems arise.

It was pointed out that the management of SAIG is successful in today’s environment. It was recommended that SAIG be used as a model when examining the future management of the FSA Gateway.

An additional Key Decision was raised with regards to utilizing the FSA Gateway as the service repository to expose FSA Web service capabilities to the trading partner community. This topic was added to the agenda for additional consideration in the second working session.

KEY DECISION SUMMARY

No.	Key Decision(s)	Options	Potential Solution
Communication with Trading Partners	1. How many external points of data exchange with the FSA environment are needed?	<ul style="list-style-type: none"> • One entry point for everything. • Multiple entry points managed as a single virtual entry point. 	<ul style="list-style-type: none"> • Multiple entry points managed as a single virtual entry point. • Trading partners should not connect directly with FSA systems. • No single point of failure. • Minimize the overall number of interfaces. • Have a strategy for retiring outdated data transfer methods.
	2. What considerations should FSA make when marketing the FSA Gateway concept to trading partners?	<ul style="list-style-type: none"> • Centrally managed, single virtual point of data exchange between FSA and its trading partners. 	<ul style="list-style-type: none"> • Centralize all documentation and publication of interface capabilities.
	3. How will data exchange failures with trading partners be effectively communicated?		<ul style="list-style-type: none"> • Provide intelligent acknowledgement for real-time and batch processing. • Provide centralized capability to view interface status.
Architecture Considerations	1. What criteria should be used to direct trading partners between batch and real-time capabilities		<ul style="list-style-type: none"> • Needs must be balanced with realistic expectations. • Batch and real-time must be clearly defined with respect to trading partners. • Capability usage should be monitored to detect inappropriate use. • Users must be educated on what capabilities are available and appropriate uses.



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No.	Key Decision(s)	Options	Potential Solution
	2. What data formats will be supported by the FSA Gateway? What are potential data format impacts to external partners?	<ul style="list-style-type: none"> • All formats • XML only • Core Components 	<ul style="list-style-type: none"> • Phasing – all formats must be supported near-term. • Long-term drive should be toward schema-base, XML-centric formats. • Ideally support the data format that is used in internal data exchange as this reduces the need for data transformation.
	3. How and where will data validation occur?	<ul style="list-style-type: none"> • Internal integration platform validation capabilities leveraged. • Individual interfaces perform validation. • System validation. • Validation layer in the FSA Gateway. 	<ul style="list-style-type: none"> • Different layers of validation logic are required. • Goal should be to capture data errors as early as possible in the process. • The FSA Gateway may handle some varied levels of validation. • The FSA Gateway will not hold system-level business logic.
	4. Will data compression be handled by the Trading Partners or the FSA Gateway?	<ul style="list-style-type: none"> • Trading partners handle. • FSA Gateway enables compression. 	<ul style="list-style-type: none"> • By the FSA Gateway when feasible to minimize impact to trading partners.
	5. Do we want to deploy software to trading partners in order to enable data exchange?		<ul style="list-style-type: none"> • Deployment of client-side software should be avoided if possible. • The need for client software to perform services such as packaging, formatting, etc. should be minimized. • Attempt to use standardized software packages when possible – for example WinZip for compression. • Internet browser plug-ins may serve as a “middle-ground”.
Integration Considerations	1. What approach will be taken for FSA gateway governance?	<ul style="list-style-type: none"> • Individual system owners. • Financial aid Channels. • Centralized management. • Marketing of FSA Gateway. • Other 	<ul style="list-style-type: none"> • Centralized Management
	2. What is the future role of SAIG?		<ul style="list-style-type: none"> • Current capabilities of SAIG should be made available as part of the FSA Gateway.



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No.	Key Decision(s)	Options	Potential Solution
	3. How will the external integration layer interact with the internal integration platform?		<ul style="list-style-type: none"> • The FSA Gateway will act as a 'plug-in' to the internal integration platform. It should simply act as another 'component' of the integration services. • Business process management and transformation services would be performed by the internal integration layer.
	4. What type(s) of security will be required by the FSA Gateway for batch and real-time forms of data exchange?		<ul style="list-style-type: none"> • Encryption isn't the only answer. • Authentication/Access controls should be in place.

New Action Items

Action Item	Owner	Date Due
None at this time.	N/A	N/A

Next Meeting Time

Wednesday, 09/10/2003 - 1:00 PM.

Suggested Agenda Items

Refine key decisions from first working session.



Appendix C: Meeting Minutes – Working Session #2

Date: Wednesday, 09/10/2003

Time: 1:00 – 3:00 PM

Location: 221A

Objectives: The objectives of the second working session were to review options discussed in the first working session for the External Data Exchange Strategy and to decide upon the options that will best meet FSA’s future needs.

Attendees:

Name	Business/System Area	E-Mail	Phone (Work)	Attendance
Michele Brown	FSA/Students	Michele.brown@ed.gov	202.377.3203	X
Jim Greene	FSA/CIO	James.green@ed.gov	202.377.3560	X
Terry Hardgrave	Pearson/CIO	Terry.hardgrave@ed.gov	202.377.3238	X
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Action Items from Previous Meeting Minutes

N/A

Discussion Points

Concern was raised over whether the direction would be that all transactions evolve to utilize XML. It was agreed that XML is the preferred data format; however, XML may not make sense for some transactions. In these cases, the current data format would be preserved.

Performance concerns were raised over performing simple validation at the FSA Gateway. It was clarified that most data validation would occur at each destination system with minimal data format validation taking place at the FSA Gateway.

It was noted that data compression software must be supported by all types of systems.



**Data Strategy Enterprise-Wide
Technical Strategies
External Information Access
(FSA Gateway) Strategy**

It was decided that Web services would be part of the FSA Gateway. Consideration must be given as to where service capability documentation resides.

KEY DECISION SUMMARY

No.	Key Decision(s)	Options	Potential Solution
Communication with Trading Partners	1. How many external points of data exchange with the FSA environment are needed?	<ul style="list-style-type: none"> • One entry point for everything. • Multiple entry points managed as a single virtual entry point. 	<ul style="list-style-type: none"> • Multiple entry points managed as a single virtual entry point. • Trading partners should connect directly to the FSA Gateway. • No single point of failure. • Minimize the overall number of interfaces. • Have a strategy for retiring outdated data transfer methods.
	2. What considerations should FSA make when marketing the FSA Gateway concept to trading partners?	<ul style="list-style-type: none"> • Centrally managed, single virtual point of data exchange between FSA and its trading partners. 	<ul style="list-style-type: none"> • Centralize all documentation and publication of interface capabilities.
	3. How will data exchange failures with trading partners be effectively communicated?		<ul style="list-style-type: none"> • Provide intelligent acknowledgement for real-time and batch processing. • Provide centralized capability to view interface status. • Dedicated interface team to deal with all data transfer errors between FSA and trading partners. • Standardized error messages should be used with trading partners. • Consolidation and documentation of FSA error codes should take place and severity levels should be leveraged.



**Data Strategy Enterprise-Wide
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No.	Key Decision(s)	Options	Potential Solution
Architecture Considerations	1. What criteria should be used to direct trading partners between batch and real-time capabilities		<ul style="list-style-type: none"> • Performance expectations of real-time vs. batch must be taken into account. • Batch and real-time must be clearly defined with respect to trading partners. • Capability usage should be monitored to detect inappropriate use. • Users must be educated on what capabilities are available and appropriate uses. • Decisions to make a transaction real-time should be based upon a business requirement or when business processes dictate.
	2. What data formats will be supported by the FSA Gateway? What are potential data format impacts to external partners?	<ul style="list-style-type: none"> • All formats • XML only • Core Components 	<ul style="list-style-type: none"> • Phasing – all formats must be supported near-term. • Long-term drive should be toward schema-based, XML-centric formats; however, some transfers may never move to XML. • Ideally support the data format that is used in internal data exchange as this reduces the need for data transformation.
	3. How and where will data validation occur?	<ul style="list-style-type: none"> • Internal integration platform validation capabilities leveraged. • Individual interfaces perform validation. • System validation. • Validation layer in the FSA Gateway. 	<ul style="list-style-type: none"> • Different layers of validation logic are required. • Goal should be to capture data errors as early as possible in the process. • The FSA Gateway may handle some varied levels of validation. • The FSA Gateway will not hold system-level business logic. • Consideration must be given to batch vs. real-time requirements.
	4. Will data compression be handled by the Trading Partners or the FSA Gateway?	<ul style="list-style-type: none"> • Trading partners handle. • FSA Gateway enables compression. 	<ul style="list-style-type: none"> • By the FSA Gateway when feasible to minimize impact to trading partners. • Compression software must be supported by all systems. • Outbound compression is also needed, although some trading partners do now support.



**Data Strategy Enterprise-Wide
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No.	Key Decision(s)	Options	Potential Solution
	5. Do we want to deploy software to trading partners in order to enable data exchange?		<ul style="list-style-type: none"> • Deployment of client-side software should be avoided if possible. • The need for client software to perform services such as packaging, formatting, etc. should be minimized. • Attempt to use standardized software packages when possible – for example WinZip for compression. • Internet browser plug-ins may serve as a “middle-ground”. • Different classes of users must be considered.
Integration Considerations	1. What approach will be taken for FSA gateway governance?	<ul style="list-style-type: none"> • Individual system owners. • Centralized management. • Marketing of FSA Gateway. • Other 	<ul style="list-style-type: none"> • Centralized Management
	2. What is the future role of SAIG?		<ul style="list-style-type: none"> • Current batch data transfer capabilities of SAIG should be made available as part of the FSA Gateway. • Other options for enabling batch data transfer should be considered.
	3. How will the external integration layer interact with the internal integration platform?		<ul style="list-style-type: none"> • The FSA Gateway will act as a node on the internal integration platform. It should simply act as another ‘component’ of the integration services. • Business process management and transformation services would be performed by the internal integration layer.
	4. What type(s) of security will be required by the FSA Gateway for batch and real-time forms of data exchange?		<ul style="list-style-type: none"> • Encryption isn’t the only answer. • Authentication/Access controls should be in place. • 128-bit SSL should be leveraged to comply with the Patriot Act. • Must be consistent with FSA Security and Privacy Policy. • Must be inline with the E-gov initiative.

New Action Items

Action Item	Owner	Date Due
None at this time.	N/A	N/A



**Data Strategy Enterprise-Wide
Technical Strategies
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Next Meeting Time

N/A

Suggested Agenda Items

None at this time.