

# Supplemental Business Case Information For BYs 2003 & 2004 IT Useful Segments

This document collects supplemental business case information for IT useful segments. The Department Investment Review Board will use this information to determine which IT enhancements to undertake, in accordance with the Clinger-Cohen Act, and for monitoring initiative progress.

Please answer each question. Responses should be concise, and prepared at a level of detail commensurate with the initiative lifecycle phase, size/criticality, and type. Initiatives that have not been implemented or deployed will require more detailed information than an initiative in maintenance. We will use the information collected to create a baseline for the initiative.

Please type your responses in the white answer blocks of the Business Case Responses document and return the electronic copy of that document to Treva Lutes by June 7th. Please do not modify the shaded rows of the table. These rows contain special codes that we will use to populate a database automatically.

## 1. Useful Segment Name *Provide the name of the useful segment and its respective initiative.*

Useful Segment Name: Release I  
Initiative Name: NSLDS II

## 2. Useful Segment Description

*Briefly describe the useful segment in a concise, non-technical, management-oriented manner (two paragraphs maximum please).*

The primary focus of NSLDS II will be to support existing business requirements through a reengineered system, or other modernized systems, plus modernizing internal processing capabilities.

Capabilities:

- Establish a modernized technical platform
  - Program-wide data warehousing capabilities
  - Powerful analytical tools
  - Near real-time access to FSA-maintained aid
- Refine existing data feeds and edits, with minimal disruption to the community, to provide for the continuous improvement of data
- Reduce NSLDS operational costs by 25-50%
  - Consider cost impact on interfacing systems, both internal and external

The initial focus of the work will be on modernizing the NSLDS technical platform, which includes providing for both near real-time access to FSA-maintained data and data warehousing.

Over its eight-year life, NSLDS has served as both a transactional system supporting the "latest information" needs of systems and users, as well as the role of FSA's analytical Title IV aid data warehouse. Focus group discussions with key NSLDS users and stakeholders led the Reengineering team to conclude that the system must continue to service these needs while addressing targeted improvements in data and financial integrity, customer satisfaction, and reduced operational costs. One opportunity for achieving improvements in each of these target areas is through reengineering the data warehouse functions of NSLDS.

Reengineering the existing NSLDS architecture can be split logically into two parts: data architecture changes and technical platform changes. Data architecture changes address the functional use and source of data stored in the warehouse, while technical platform changes address the storage architecture and tools used to access and represent this data. Data architecture changes are documented in the upcoming FP Data Feed Reengineering and Internal FSA

Direct Access initiatives. This Data Warehousing “big idea” for NSLDS II Reengineering focuses on achievable improvements in the technical platform area.

The collection of detailed data to support the transactional functions of NSLDS has enabled NSLDS to grow into a deep data repository. For example, some data goes back as far as 1965. NSLDS analytical functions such as program analysis, research and policy development, budget formulation and execution, and financial aid history trending rely heavily on the ability to mine and display this valuable repository of historical data.

Although NSLDS supports these functions today, reengineering opportunities exist to improve the usability of this data and to reduce the annual costs associated with operating the system.

Currently, NSLDS data is stored in a DB2 database maintained in a mainframe platform in the Virtual Data Center (VDC). Actions and updates to this database are performed primarily in a batch fashion through COBOL programs generated with COOL:Gen, a Computer Associates (CA) Computer Aided Systems Engineering (CASE) tool. Other than batch updates, users and NSLDS support staff can also access and manipulate NSLDS data through various mainframe tools including SPUFI (used for updates and data manipulation) and Query Management Facility (QMF). In addition to these mainframe-based user interfaces, a website is available for users to access individual financial aid history or request the execution of “canned” reports.

The two opportunities detailed below focus on improving the tools and methods used to access NSLDS data to better meet the needs of its users while realizing potential reductions in NSLDS operational costs.

## 1. Data Warehousing

### *Improved Data Usability*

A major theme throughout the focus group discussions with FSA stakeholders was that accessing NSLDS data and generating reports is difficult and time consuming. In today’s NSLDS environment, users have one of three choices to access views/reports from NSLDS:

Launch a pre-defined report, returning results in as little as hours or as much as days.

Develop an ad-hoc query using the mainframe QMF tool. Using this tool can be difficult and time-consuming if the user does not have experience with Structured Query Language (SQL) or the NSLDS data model and codes. Even with this knowledge, use of QMF can result in lengthy query execution times and incorrect result sets.

Request the creation and execution of custom reports by NSLDS’s support staff. In addition to costs associated with custom report creation, lead-time required to get the requested information may be excessive.

To improve the timeliness and ease with which reports can be generated, users should be given easier-to-use, self-service query access to NSLDS II. One method for providing this access is to redesign the database structure so that it can better serve the analytical and information delivery functions as well as to the necessary transactional functions. To implement these changes, the redesign would involve reorganizing the data into a more warehouse friendly (in some cases de-normalized) structure. This reorganization would be performed either within DB2 or potentially another database platform suitable for very large data warehouses, such as Teradata. Users should also be provided a modern query tool, like MicroStrategy, so that they can focus on the value and usefulness of the data, rather than on the capabilities and limitations of the tools.

In addition to improving the delivery of NSLDS II data through reports, users have requested that demographic information about the data (metadata) be available in views and reports. Knowing this information about the data will help users determine its timeliness and accuracy. For example, data should be displayed with effective dates so that users know when a loan record was last updated.

### *Reduce Operational Costs*

The other goal of the data warehousing component of NSLDS II Reengineering is to reduce existing NSLDS operational costs. The cost of NSLDS to FSA will be approximately \$16 million in FY02. Approximately \$9 million will be spent on application maintenance and help desk support. The remaining \$7 million will be spent on VDC/operations costs. Based on the experience of the Modernization Partner, re-platforming NSLDS from its more

expensive mainframe platform to a more cost-effective mid-range platform is one way to reduce these costs. These savings can be realized in a number of ways, including: lower annual software licensing costs, lower annual hardware maintenance/licensing costs, and lower annual maintenance staff costs (i.e. the need for fewer Database Administrators, report programmers, etc.).

However, strictly re-platforming NSLDS is only one part of the equation. Re-platforming should be performed in concert with improving the tools and examining the processes performing data acquisition, data storage and data access. There are many questions to be considered during the redesign of NSLDS, such as: how is data acquired, how is data stored, how much data is stored, how is NSLDS accessed, how much data can be accessed with/without the help of support personnel, and how much effort/cost is expended on system maintenance and support. During the remainder of the definition process, these cost-saving opportunities and open questions will be addressed in greater detail.

#### *Data Warehouse Platform Alternatives*

As part of this phase of work, two options for the redesign of the data warehouse platform were drafted. The first option builds on a foundation that positions NSLDS II as the enterprise data warehouse, using its broad base of current and historical Title IV information at a summary and detailed level. The second option spreads the enterprise data across an environment of multiple data marts.

**Single NSLDS II Enterprise Wide Data Warehouse:** This option focuses on designing and positioning NSLDS II as the enterprise-wide data warehouse that feeds other data marts as required

Some major advantages of this option are:

- Single data acquisition infrastructure, positioning NSLDS II for future “fetches” and data feeds into a single repository
- Centralized and consistent data
- Streamlined data acquisition, storage and access helps reduce development, infrastructure and maintenance and support costs
- Cross-system detail and summary data provide decision support and Executive Information System capabilities
- Enhanced ability to provide consistent information about reports and report fields to users (metadata)

Challenges for this option are:

- Requires modification to existing FSA data marts in order to take advantage of the redesigned NSLDS II architecture.
- Higher initial costs to build the enterprise platform and convert the existing NSLDS data

**Expand Existing Data Marts:** This option involves the expansion of existing data marts to assume major data categories from NSLDS. For example, the Financial Partner Data Mart would be expanded to include detail FFEL Loan data in addition to the summary FFEL data it stores today. Also, the Credit Management Data Mart would be expanded to include all FSA system data, like demographics and Pell grant data, in addition its current Direct Loan detail data. As a result, NSLDS II would then store the data from areas not covered by these expanded marts.

Some major advantages of this option are:

- A staggered investment approach, meaning that rather than retiring and re-platforming all NSLDS functions at one time, portions of NSLDS functionality can be retired from the existing system as they are consumed by the other data marts
- Lower initial costs, since the platforms and marts are already in place, these would require enhancements rather than initial deployment

Challenges for this option are:

- No longer a single data acquisition infrastructure, making it difficult to position NSLDS II for future “fetches” and feeds into a single repository
- Data acquisition, storage and access are distributed resulting in higher long-term development, infrastructure and maintenance and support costs
- Difficult to create cross-system detail and summary reports and queries

When dealing with historical and analytical data, it is the experience of the Modernization Partner that the best practice is to build an enterprise data warehouse. As this data warehouse is built, it should be placed on a platform that can take advantage of best-of-breed COTS tools, such as Informatica and MicroStrategy, to streamline the data acquisition and data access processes. These solutions will help achieve the objective of increasing customer satisfaction through improved data usability and reduced operational costs.

## 2. Internal FSA Direct Access

Another key element of NSLDS II Reengineering is to provide direct access to more timely information for FSA-maintained aid. This includes detailed information from internal FSA systems regarding direct loans, Pell grants, default collections, and demographic data for students, schools, lenders, servicers and GAs. These FSA-maintained systems send NSLDS flat-file data extracts as follows:

- CPS, which sends student demographic information (quarterly)
- PEPS, which sends school and partner demographic information (weekly)
- RFMS/PGRFMS (to be replaced by COD), which sends Pell grant information (daily)
- DLSS, which sends direct loan servicing information (weekly)
- DMCS, which sends loan default and grant overpayment information (weekly)

As listed above, NSLDS receives its data at varying intervals, resulting in old, stale data and inconsistent “snapshot-in-time” views within its database. Opportunities to improve this process are:

- Acquiring data more frequently from FSA systems
- Standardizing the timing of data feeds to have a consistent effective date

In order to address these opportunities, NSLDS II Reengineering is exploring two methods for implementing timeliness improvements:

- “Push” Method, which continues to rely on the existing approach of “pushing” data from source systems into NSLDS II, while introducing improvements in the frequency and standardizing the timing of data feeds
- “Fetch” Method, which provides for the direct access or “fetching” of data from source systems for FSA-maintained aid and NSLDS II for other aid programs (e.g., FFEL, Perkins)

**“Push” Method:** In the “push” method, FSA systems would extract changed records daily (vs. weekly, monthly or quarterly) and send the data to NSLDS II over the EAI bus. As a result of these daily feeds, data for FSA-maintained aid stored in NSLDS II would be consistent and current. Since NSLDS II will also continue to store FFEL aid, Campus-Based aid and enrollment information, the EAI bus does not need routing logic to support transactional requirements such as eligibility checking. For example, when CPS requests pre-screening data from NSLDS II, it would still deliver pre-screening data from its own database as it does today. However, NSLDS II would now have data for FSA-maintained aid that is only one day old, rather than a week old.

Advantages of this method are:

- Eliminating the “snapshot-in-time” views issue
- Improving the timing so that data in NSLDS II is as current as one day old
- Minimizing peak time processing burden for queries against core systems (unlike the “fetch” option below)
- Reducing error correction cycles

Challenges for this method are:

- Data in NSLDS II may not be as current as the source system
- Requires minor changes to core systems to “push” data more frequently
- Uses the existing batch data exchange capabilities of EAI, rather than exploiting its potential real-time data “fetch” capabilities

**“Fetch” Method:** In the “fetch” method, NSLDS II would directly fetch FSA-maintained aid data from FSA systems. It would do so using an intelligent router to point to the source systems and an aggregator to assemble the returned data. The EAI bus will continue to query NSLDS II for FFEL aid, Campus-Based aid and enrollment information. For

example, when CPS requests pre-screening data from NSLDS II, the EAI bus would contain the logic to know where to go – DLSS, DMCS, COD, etc. –directly to get direct aid data, and to NSLDS II for FFEL and Perkins data. The EAI bus would also have the logic to assemble pre-screening data results “fetched” from these systems.

Advantages of this method are:

- NSLDS II delivers functions with the most current data possible
- Positions FSA for the future by taking advantage of the intelligent routing and aggregation features of the EAI bus

Challenges of this method are:

- Issuing large real-time queries against FSA core systems (DLSS, COD, DMCS, etc.) could cause adverse performance impacts
- Requiring potential major changes to core systems to accept real-time queries
- Introducing higher level of complexity by providing routing intelligence and aggregation within the EAI bus

Based on the NSLDS II business requirements, real-time access to FSA-maintained aid is not essential – particularly since most of the source systems are updated in batch instead of real-time. Direct access to these source systems may only provide access to day-old data. However, creating the infrastructure to deliver near real time access to FSA-maintained aid is the correct modernization step to take toward improving the quality of NSLDS.

### 3. Solution Impact

*(1) What will be the impact of the useful segment on lines of business and business processes? (2) What is the impact of the useful segment on other IT initiatives? (3) Identify the direct beneficiaries, customers, users, and any additional stakeholders of the useful segment. (4) Describe how the direct beneficiaries, customers, users, and additional stakeholders are involved with the planning, development, and operation of the useful segment. (5) What are the major organization restructuring, training, and change management projects that will be required?*

1) The Solution impact of the NSLDS system is that it is the sole repository for Title IV recipients and their loans, Pell grants, Lenders, Guaranty Agencies, Servicers and Schools, making the system the focal point to house the functions listed in 2.1.

2) The NSLDS reengineering initiative is dependent on legacy and modernized interfaces including CSFB (Common Servicing for borrowers), DLSS (Direct Loan Servicing System), COD (Common Origination and Disbursement) and Consistent Answers systems (demographic data) which is scheduled to go –live approximately at the same time with NSLDS.

3) The stakeholders for this Initiative will be:

- FSA and other federal agencies (OMB, GAO) – will be able to use accurate data for budget forecasting, policy analysis, at a lower operating cost. Additionally, will be able to maintain the centralized repository at a lower operating cost.
- Financial partners (GAs, lenders, and servicers)
- Schools and students – they will receive more accurate information on student aid tracking, eligibility.

4) Applicable stakeholders to the future phases of work have been involved in planning and discussing the initiative.

5) N/A

### 4. Mandatory Requirement

*Is this useful segment, or the business process it supports, required by legislation, regulation (CFR citation), or other guidance (e.g., OMB Circular, Presidential Management Memorandum)? If so, please cite the specific section number, name, and language of the requiring provision. Additionally, if the business process is required, then please indicate the extent to which the useful segment supports the business process and compliance with the requiring provision.*

The Higher Education Amendments of 1998, Sec. 483 B [20 U.S.C 1092b], established FSA as a Performance Based Organization (PBO) within the Federal Government charged with modernizing the delivery of student financial aid. The underlying goal was to improve services to millions of students and the postsecondary institutions they attend. As one of the main objectives of this designation, Congress mandated that FSA implement a common, open, integrated system for student financial aid delivery. The NSLDS II reengineering phase is being implemented to support this mandate.

The Higher Education Act of 1965 congressionally mandated the need for a national student data repository. NSLDS currently performs this function in conjunction with the existing data marts.

## **5. Consequence of Not Funding the Useful Segment**

*Describe the adverse impacts on business operations or future costs if the useful segment is not funded.*

*The business case is improved when an operation or business process is highly dependent on the useful segment or delaying the useful segment will result in significantly higher costs in the future.*

In the case that this Initiative is not funded, FSA will face the following consequences:

1. Gaps in data integrity and financial integrity
2. Low reusability of NSLDS data due to current legacy platforms
3. Relatively high operating costs related to NSLDS
4. Inefficient customer service due to lack of modernized analytical tools

## **6. Benefits**

*Please describe the benefits associated with the useful segment, including how the investment reduces costs or improves efficiencies.*

*Benefits are the advantages or gains the useful segment produces for customers, the public, or the Department. Benefits can include increased efficiencies, improved customer satisfaction, reduction in costs, increase in revenue, or improved public access to ED information.*

Benefits to implementing the NSLDS Reengineering initiative will include:

- Reduced FSA operating costs associated with NSLDS.
- Improved financial integrity.
- Improved quality and usability of NSLDS information, benefiting the Department and other NSLDS users in the financial aid community.
- Balanced FSA data needs with burdens placed on the financial aid community.
- Improved usability of NSLDS data repository through new tools.
- Efficient use of data resources available within FSA and from the financial aid community.

## **7. Crosscutting Initiative**

*Indicate which Principal Offices the useful segment supports. If the useful segment supports the entire Department, then simply select that item. If the useful segment supports entities outside of the Department, then in addition to selecting "Entities outside of the Department," please identify the agencies and organizations affected by this useful segment.*

- Entire Department
- Office for Civil Rights
- Office of Educational Research and Improvement
- Office of Elementary and Secondary Education
- Office of English Language Acquisition
- Office of Postsecondary Education
- Office of Special Educational and Rehabilitation Services
- Federal Student Aid
- Office of Vocational and Adult Education
- Office of the Chief Financial Officer
- Office of the Chief Information Officer
- Office of the General Counsel
- Office of Inspector General
- Office of Intergovernmental and Interagency Affairs
- Office of Legislation and Congressional Affairs
- Office of Management
- Office of Public Affairs
- Entities outside of the Department

### 8. Audit Finding

*Does the useful segment close an audit recommendation? If so, please describe the recommendation and note the audit name or number.*

No