

# SFAP BASELINE CHARACTERIZATION DOCUMENT

## Table of Contents

---

	<i>Page</i>
<b>1. INTRODUCTION .....</b>	<b>1-1</b>
1.1 SFAP Background.....	1-1
1.2 Purpose and Scope.....	1-2
1.3 Relationship to other documents .....	1-4
1.4 Assumptions.....	1-6
1.5 Document Organization.....	1-7
<b>2. WORK VIEW.....</b>	<b>2-1</b>
2.1 Business Context Diagram.....	2-1
2.2 Business Functions .....	2-3
2.3 Comparison with Architecture Principles .....	2-25
<b>3. INFORMATION VIEW.....</b>	<b>3-1</b>
3.1 Data Groups and Information Detail .....	3-1
3.2 Data Location.....	3-4
3.3 Comparison with Architecture Principles .....	3-6
<b>4. APPLICATION VIEW.....</b>	<b>4-1</b>
4.1 Application Systems Inventory .....	4-1
4.2 Application to Function Cross-Reference.....	4-17
4.3 Comparison with Architecture Principles .....	4-19
<b>5. TECHNOLOGY VIEW .....</b>	<b>5-1</b>
5.1 Current Hardware, Software, and Communication Components .....	5-1
5.1.1 Technology Inventory.....	5-1
5.1.2 Standards to Platform Cross-Reference .....	5-14
5.2 Comparison with Architecture Principles .....	5-19
<b>6. SECURITY VIEW.....</b>	<b>6-1</b>
6.1 User Classes .....	6-1
6.2 Security Products and Standards .....	6-4
6.3 Comparison with Architecture Principles .....	6-5
<b>7. SUMMARY .....</b>	<b>7-1</b>

# **SFAP BASELINE CHARACTERIZATION DOCUMENT**

## **Table of Contents (cont'd)**

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**APPENDIX A ACRONYMS AND DEFINITIONS**

**APPENDIX B GLOSSARY**

**APPENDIX C COST DERIVATION APPROACH**

**APPENDIX D CURRENT SYSTEM SUMMARY EVALUATION**

**APPENDIX E REFERENCES**

# SFAP BASELINE CHARACTERIZATION DOCUMENT

## Table of Tables

---

	<u>Page</u>
TABLE 2-1. FUNCTION 1: FISAP PROCESSING .....	2-4
TABLE 2-2. FUNCTION 2: AWARD PROCESSING .....	2-5
TABLE 2-3. FUNCTION 3: WAIVER TRACKING .....	2-6
TABLE 2-4. FUNCTION 4: APPLICATION PROCESSING AND MANAGEMENT .....	2-7
TABLE 2-5. FUNCTION 5: SCHOOL AND STATE PAYMENT PROCESSING AND MANAGEMENT .....	2-8
TABLE 2-6. FUNCTION 6: DEFAULTED DEBT MANAGEMENT AND COLLECTIONS .....	2-9
TABLE 2-7. FUNCTION 7: LENDER AND GUARANTY AGENCY PAYMENT PROCESSING.....	2-10
TABLE 2-8. FUNCTION 8: CONSOLIDATION PROCESSING .....	2-11
TABLE 2-9. FUNCTION 9: LOAN ORIGATION MANAGEMENT.....	2-12
TABLE 2-10. FUNCTION 10: CUSTOMER SERVICE .....	2-13
TABLE 2-11. FUNCTION 11: LOAN SERVICING .....	2-14
TABLE 2-12. FUNCTION 12: STUDENT STATUS CONFIRMATION REPORTING.....	2-15
TABLE 2-13. FUNCTION 13: SCHOOL, GA, LENDER AND SEVICER DEFAULT CALCULATION & INFORMATION SUPPORT.....	2-16
TABLE 2-14. FUNCTION 14: SCHOOL ELIGIBILITY DATA MANAGEMENT.....	2-17
TABLE 2-15. FUNCTION 15: GUARANTY AGENCY, LENDER, SERVICER ELIGIBILITY DATA AND SUPPORT .....	2-18
TABLE 2-16. FUNCTION 16: SYSTEM CHARGEBACK BILLING AND INVOICE MANAGEMENT .....	2-19
TABLE 2-17. FUNCTION 17: ACCOUNTING AND FINANCIAL MANAGEMENT .....	2-20
TABLE 2-18. FUNCTION 18: BORROWER REPAYMENT PROCESSING .....	2-21
TABLE 2-19. FUNCTION 19: PROGRAM MONITORING.....	2-22
TABLE 3-1. SFAP TITLE IV SYSTEM DATA GROUPS.....	3-1
TABLE 3-2. APPLICATION SYSTEM TO DATA GROUP RELATIONSHIPS .....	3-3
TABLE 3-3. DATA LOCATION.....	3-5
TABLE 4-1. APPLICATION INVENTORY .....	4-2
TABLE 4-2. TECHNICAL STANDARDS.....	4-9
TABLE 4-3. CURRENT SYSTEMS ITEMIZED COST.....	4-15
TABLE 4-4. APPLICATION TO BUSINESS FUNCTION CROSS REFERENCE.....	4-17
TABLE 5-1. TECHNOLOGY PLATFORM INVENTORY .....	5-3
TABLE 5-2: CURRENT SYSTEM PLATFORM STANDARDS .....	5-14
TABLE 6-1. SFAP USER CLASSES .....	6-2
TABLE 6-2. USER CLASSES ACCESS TO DATA GROUPS .....	6-3

# SFAP BASELINE CHARACTERIZATION DOCUMENT

## Table of Figures

---

	<i>Page</i>
FIGURE 1-1. RELATIONSHIP BETWEEN COMPONENTS OF THE BASELINE CHARACTERIZATION VIEWS.....	1-3
FIGURE 1-2. TAFIM SBA PROCESS.....	1-4
FIGURE 2-1. SFAP BUSINESS CONTEXT TEMPLATE .....	2-2
FIGURE 2-2. BUSINESS FUNCTIONS COST BREAKDOWN .....	2-24
FIGURE 4-1. APPLICATION COST DISTRIBUTION .....	4-16
FIGURE 7-1. TECHNOLOGY QUALITY VS. TECHNOLOGY EVOLUTION ASSESSMENT .....	7-2
FIGURE 7-2. TECHNOLOGY QUALITY VS. STRATEGIC VALUE ASSESSMENT.....	7-3
FIGURE 7-3. OVERALL ASSESSMENT .....	7-4

## 1. INTRODUCTION

The Department of Education's (ED's) Office of Postsecondary Education (OPE), Student Financial Assistance Programs (SFAP) is embarking on an effort to improve service to SFAP customers and stakeholders while efficiently managing program costs. Key components toward success in this effort include improving the information technology (IT) supporting SFAP, reengineering business processes and developing a standards based enterprise architecture. Toward this goal the Director of SFAP's Technology Planning and Analysis Staff (TPAS) has sought to define a new SFAP systems enterprise architecture to meet its emerging processing goals. A series of documentation based on the Department of Defense's Technical Architecture Framework for Information Management (TAFIM) is planned to define this new architecture. This *Baseline Characterization* document, the second of several planned TAFIM deliverables focusing on the enterprise architecture, characterizes SFAP's current systems.

The baseline characterization inventories and describes the current systems in terms of communications, hardware, system software and applications within SFAP. The baseline characterization creates a foundation with which SFAP can determine its current IT architecture status. Furthermore, it can be used to establish a starting point for target architecture development.

This section encompasses the following subsections:

**1.1 SFAP Background** provides an overview of SFAP.

**1.2 Purpose and Scope** defines the intent of the document and the range of activities considered in the baseline characterization effort.

**1.3 Relationship to other SFAP documents** describes how the *Baseline Characterization* document relates to other SFAP Enterprise Information Technology Architecture documents.

**1.4 Assumptions and Constraints** lists the high level assumptions and constraints used in completing this document.

**1.5 Document Organization** describes the sections and appendices included in the *Baseline Characterization* document.

### 1.1 SFAP Background

ED is the smallest federal government cabinet level department, with less than 5,000 staff. The number of programs administered in fiscal year (FY) 1997 was 197. ED provided or oversaw \$67.6 billion in aid to education in FY 1997, including program funding, new student loans, and federal administration. Within ED, SFAP's mission is to ensure that postsecondary student aid delivery and program management is efficient, financially sound, and customer responsive. SFAP's portfolio of outstanding student loans totaled about \$131 billion in FY 1997. In 1994-95, federal education funds represented 74.7% of all student financial aid awarded to postsecondary students. SFAP has identified the creation of an integrated, accurate, and efficient student aid delivery system as a core strategy for achieving its mission.

## 1.2 Purpose and Scope

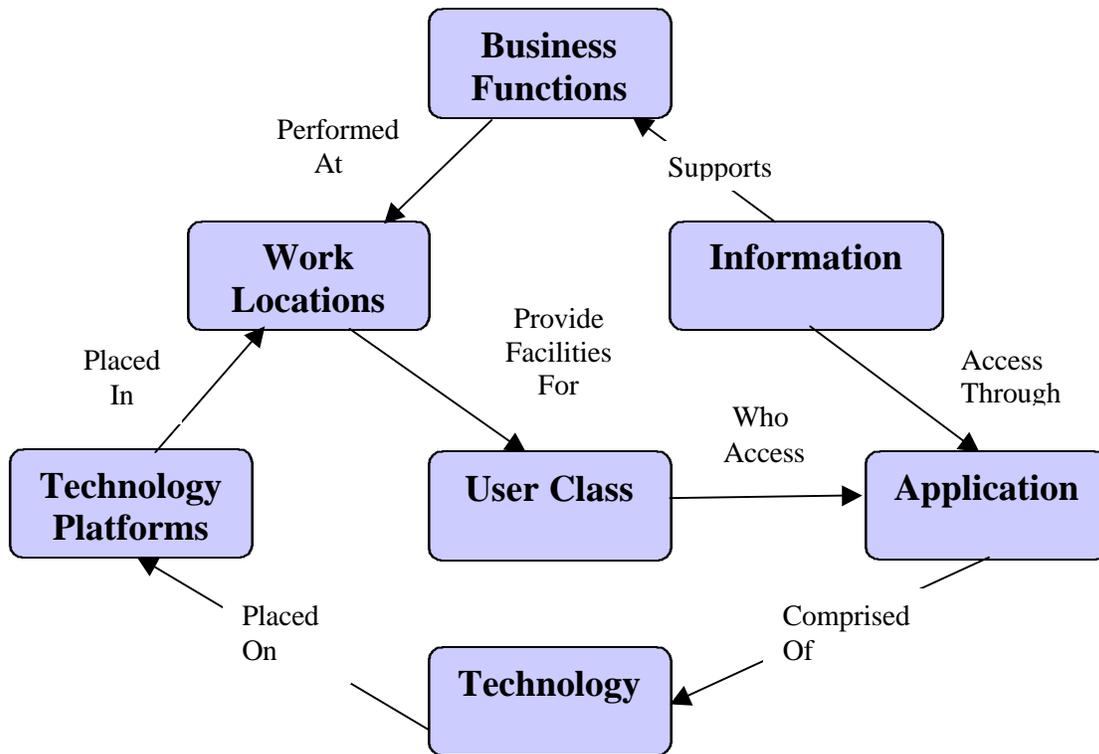
The primary purpose of the *Baseline Characterization* document is to establish a baseline or starting point for future architecture development. Baseline characterization is not an operational review or audit but more an assessment and characterization of the current environment. The TAFIM architecture framework provides an effective means for organizing this review and presenting the current status.

The TAFIM prescribes five different architecture views to reflect the transformational change involved in developing an IT infrastructure. The baseline characterization phase results in a picture of the existing architecture along five key dimensions or views: work, information, applications, technology and security. These five architectural views are defined as follows:

- **Work View.** This view defines the major business functions carried out by SFAP and a high-level view of the business context.
- **Information View.** This view defines what information is required to support the execution of the major SFAP business functions. It also describes the physical databases used to hold this information.
- **Application View.** This view describes the major application systems that support the organization and associated users. It also presents the relationship between these applications and the business functions and databases.
- **Technology View.** This view defines the types of technology services used by each application and how they are distributed on the various types of technology platforms used by SFAP.
- **Security View.** This view lists the security products used by the current Title IV systems. It also lists major users classes and maps their access rights to the different data groups within SFAP.

Within each view, the current Title IV systems are compared against architecture principles established in the *Enterprise Information Technology Architecture Framework: Business Drivers and Architecture Principles* document. These architecture principles provide a set of guidelines for IT decision-making within SFAP, and offer a means to assess the compatibility of current SFAP systems with the information processing architecture required for the future.

Figure 1-1 below graphically shows the components that comprise the TAFIM architecture views. These components interface with each other to create each of the views. For example, the Information view comprises a definition of the information groupings required by the business functions, and also a list of the applications that access these information groupings. Similarly, each architecture view is created by defining the components that comprise that view and presenting their relationships to each other.

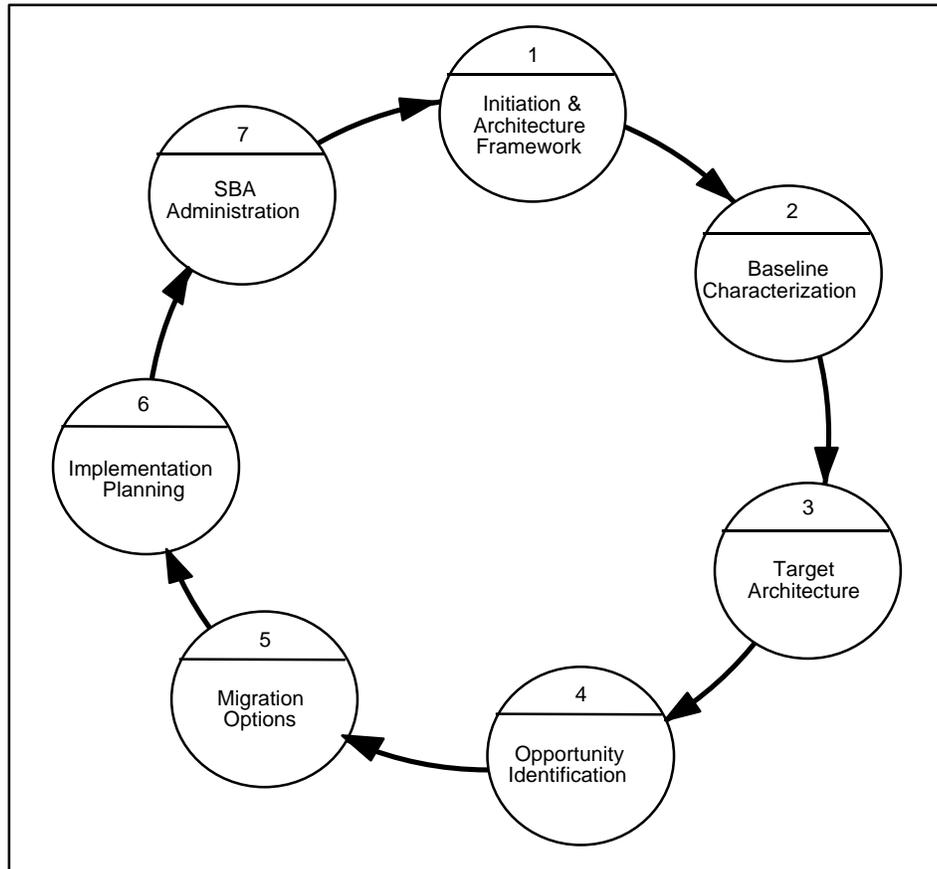


**Figure 1-1. Relationship Between Components of the Baseline Characterization Views**

The scope of the baseline characterization effort is to efficiently characterize SFAP’s current IT environment at a high level. The term “characterization” is used because the data gathering and analysis performed are not exhaustive. It is not necessary, nor is it desirable, to expend the time and effort to document every detail of the current architecture. Only enough detail is gathered to allow informed decisions to be made with regard to the desired target architecture. The baseline characterization process is designed to be “fast path” in nature. That means that traditional long-term inventory efforts will not be appropriate if the task is to proceed quickly and deliver results.

### 1.3 Relationship to other documents

The *Baseline Characterization* document is the second document in the TAFIM Standards-Based Architecture (SBA) framework. The TAFIM SBA framework consists of seven distinct but interdependent phases. Each phase produces a deliverable that guides subsequent steps. Figure 1-2 illustrates the seven phase architecture planning process.



**Figure 1-2. TAFIM SBA Process**

- 1. Initiation and Architecture Framework:** This phase involves reviewing the strategic drivers and business model of the organization and developing a set of architecture principles.
- 2. Baseline Characterization:** This phase determines where an organization is situated architecturally. This phase assesses and characterizes the current operating environment. The output of this phase is used as the starting point for architecture development.
- 3. Target Architecture:** This phase defines the target architecture components and their key attributes. The output of this phase is an organized set of definitions and models from which drawings can be made to reflect the different views of the architecture.
- 4. Opportunity Identification:** This phase identifies short-term opportunities which, once implemented, can demonstrate the value of the architecture and provide immediate

benefits to the organization. Additionally, all projects that are necessary to achieve the target architecture are identified and fleshed out in some detail.

5. **Migration Options:** This phase establishes one or more plateaus representing practical migration stages. All projects identified in the previous step are prioritized over time based on inter-project dependencies and cost/benefit analyses.
6. **Implementation Planning:** This phase results in the detailed implementation plan for the first plateau of the migration effort. It established the ground work for each successive plateau of the target architecture implementation.
7. **SBA Administration:** This phase is required to keep the architecture alive and well by continuously improving it.

The first SFAP document in this framework was the *Enterprise Information Technology Architecture Framework: Business Drivers and Architectures Principles*. The document following the *Baseline Characterization* document will be the *Target Architecture* document, where the views of the TAFIM are modeled in terms of a desirable target architecture, usually three to five years in the future. The fourth deliverable, opportunity identification, moves the target architecture out of the conceptual world into one where practical realities govern implementation. The fifth TAFIM SBA document is the migration options document that links the reality of the present to the desirability of the target architecture. The sixth and seventh documents in the TAFIM SBA process consist of a detailed implementation plan and a SBA administration plan for continuous improvement.

In addition to direct input from ED staff, several documents produced as part of Project EASI/ED (Easy Access for Students and Institutions/ED) were used in the development of the *Baseline Characterization* document. These included the following:

- *Project EASI Concept Document*, January 1997, provided the description and the contractor information for each Title IV system.
- *Project EASI/ED Acquisition Strategy (Discussion Draft)*, November 1997, provided information related to the current contract services for each Title IV system.
- *Project EASI/ED Common Operating Environment (COE) Document*, July 1998, defines the architecture services expected to comprise a future SFAP system, and identifies the standards with which any SFAP-wide implementation must comply.
- *Project EASI/ED Cost/Benefit Analysis (CBA)*, September 1997, documents the current system costs.
- *Project EASI/ED Current System Models Volume I and II*, April 1997, presents process and data models for each of ED's current systems.
- *Project EASI/ED Technical Vision and Target Architecture (TVTA) Report*, September 1997, provided technical information on ED's current system.
- *Project EASI/ED Transition Strategy*, September 1998, provided current system information in the appendix.

## 1.4 Assumptions

This subsection identifies the assumptions that affected the definition of this *Baseline Characterization* document.

- The baseline characterization reflects information provided by ED on or before October 21, 1998.
- *Project EASI Current System Models, Volumes I and II* were used as the main source of the functional dataflow, activity and datastore information on current Title IV systems.
- FY98 budget estimate information was used. (See Appendix C for more information).
- Contractor headcount data where provided is from FY97.
- The current SFAP systems analyzed in the baseline characterization are:
  - Campus-Based Programs System (CBS)
  - Central Processing System (CPS)/Electronic Data Entry (EDE) Express/Free Application for Federal Student Aid (FAFSA) on the Web
  - Direct Loan Central Database System (CDS)
  - Direct Loan Consolidation System (LCS)
  - Direct Loan Origination System (LOS)
  - Direct Loan Servicing System (LSS)
  - Federal Family Education Loan Program (FFELP) System
  - Multiple Data Entry (MDE) System
  - National Student Loan Data System (NSLDS)
  - Postsecondary Education Participants System (PEPS)
  - Pell Grant Recipient Financial Management System (PGRFMS)
  - Title IV Wide Area Network (TIVWAN)

The following applications that are a significant part of CBS system and were also included in the *Baseline Characterization*.

- Procedure Application Report Tracking (PART)
- Perkins Loan Institutional Status Tracking (PLIST)
- Return Log System
- Default Reduction Assistance Program System (DRAP)
- Low-income School Directory System
- State Student Incentive Grant (SSIG)

Since no specific data was available for these systems, information about these applications is presented in Table 4-2, Application Inventory only.

## 1.5 Document Organization

The remainder of this document is organized into the following sections:

**Section 2 – Work View.** This section describes the work view and provides the function and business context templates. It also lists inconsistencies between the SFAP architecture principles and the work view.

**Section 3 – Information View.** This section describes the information view and provides the database and application to information templates. It also lists inconsistencies between the SFAP architecture principles and the information view.

**Section 4 – Application View.** This section describes the application view in detail and provides the application inventory template, the application to standards template, application to function template and the application cost template. It also lists inconsistencies between the SFAP architecture principles and the application view.

**Section 5 – Technology View.** This section describes the technology view in detail and provides the current Title IV system architecture inventory and the location where specific platforms are located. It also lists inconsistencies between the SFAP architecture principles and the technology view.

**Section 6 – Security View.** This section describes the security view and provides the user class to data group template. It also lists inconsistencies between the architecture principles and the security view.

**Section 7 – Summary.** This section provides a brief summary of the findings for the current Title IV systems. It presents the information using three summary templates.

**Appendix A – Acronyms and Definitions.** This appendix provides a list of all acronyms used in this document and their associated definitions

**Appendix B – Glossary.** The glossary lists the key terms and definitions.

**Appendix C – Cost Derivation Approach.** This appendix describes the methodology used on compute the cost numbers for each of the Title IV systems.

**Appendix D – Current System Summary Evaluation.** This appendix defines the methodology used to evaluate the current systems. Also list the ratings for each of the Title IV systems.

**Appendix E – References.** This appendix lists the references used in creating the *Baseline Characterization* document.

## **2. WORK VIEW**

The work view describes the major operations that are performed by current system staff in support of business functions. It defines major business functions in terms of the processes carried out by users and work locations where these functions are performed.

Subsection 2.1 illustrates the business context environment of SFAP. Subsection 2.2 describes the business functions supported by the current Title IV systems. Subsection 2.3 compares the SFAP architecture principles to the information presented in the work view.

### **2.1 Business Context Diagram**

The current systems business context diagram is shown as Figure 2-1. The template shows how customers, suppliers and market forces interact with current SFAP business functions.

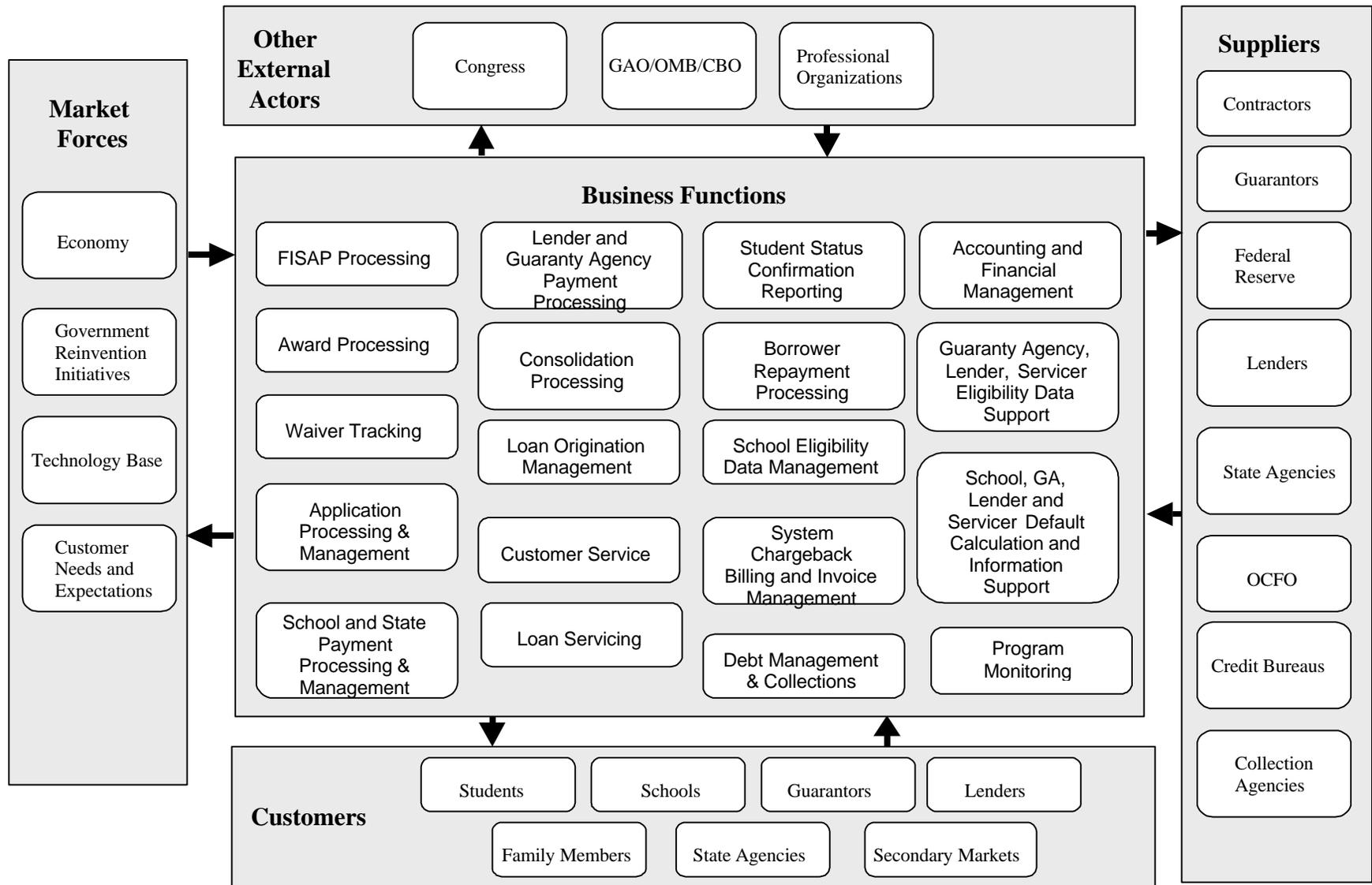


Figure 2-1. SFAP Business Context Template

## 2.2 Business Functions

This subsection defines 19 high-level SFAP business functions that represent the major operations carried out within SFAP to deliver and manage Title IV aid. Each function lists the related component processes, the functional work location, and the function headcount and budget.

One common element that applies to all 19 functions is the SFAP/Program Systems Service (PSS) mission statement that reads as follows:

The mission of SFAP/PSS is to work with our partners to support students in the following ways:

- Actively promoting and implementing improvements to student aid delivery.
- Integrating and providing student aid management and program information.
- Delivering information systems and operational processes that provide postsecondary student aid.

Each function is defined and then further broken down into processes. The input for this breakdown primarily came from the *Project EASI Current Systems Models, Volumes I and II* and from meeting notes documented in the development of the *Project EASI/ED Transition Plan*. Location data came from contract data gathered in the writing of the *Project EASI/ED Acquisition Strategy (Discussion Draft)*.

Headcount and budget numbers shown in tables 2-1 through 2-19 came from overall current system FY98 budget numbers provided by SFAP/PSS. These overall totals were broken down according to the methodology set forth in Appendix C. These estimates are not intended to represent a rigorous calculation of the exact dollars and staff used by each of SFAP's business functions. Rather, they represent an estimated view of the relative resources that SFAP invests in each of the functions when viewed in the context of its business as a whole. All headcount figures are expressed as full time equivalents (FTEs).

One template for each of the 19 major SFAP business functions is shown below.

<b>Function</b>	<b>FISAP Processing:</b> The processing of information on the Fiscal Operations Report and Application to Participate (FISAP). Necessary for participating in the Campus Based Programs.						
<b>Processes</b>	<ul style="list-style-type: none"> <li>• Produce FISAP</li> <li>• Maintain Hold Status</li> <li>• Maintain Edit Activation</li> <li>• Receive FISAP</li> <li>• Edit FISAP</li> </ul>						
<b>Location</b>	<b>CBS</b> – Portals Building, Washington D.C. (Program Office), CBS processing takes place at the ED Central Processing facility, Lockheed Martin Data Systems, 11700 Montgomery Road, Beltsville, MD 20705.						
<b>Headcount</b>	<table> <tr> <td>Government (FY98)</td> <td>2</td> </tr> <tr> <td>Contractor (FY97)</td> <td>4</td> </tr> <tr> <td>Total</td> <td>6</td> </tr> </table>	Government (FY98)	2	Contractor (FY97)	4	Total	6
Government (FY98)	2						
Contractor (FY97)	4						
Total	6						
<b>Budget</b>	<b>\$840,000</b>						

**Table 2-1. Function 1: FISAP Processing**

<b>Function</b>	<b>Award Processing:</b> The processing of awards to either students or institutions for the Campus Based, Direct Loan, Pell Grant and State Student Incentive Grant (SSIG) Title IV aid programs.						
<b>Processes</b>	<p><b>CBS</b></p> <ul style="list-style-type: none"> <li>• Perkins Loan Cancellation Processing</li> <li>• CBS Award Calculation</li> <li>• Funding Obligations</li> </ul> <p><b>CDS</b></p> <ul style="list-style-type: none"> <li>• Post School Financial Transactions</li> </ul> <p><b>LOS</b></p> <ul style="list-style-type: none"> <li>• Process Loan Disbursement Information</li> <li>• Process Drawdown</li> </ul> <p><b>PGRFMS</b></p> <ul style="list-style-type: none"> <li>• Pell Grant Award Authorizations and Adjustments</li> </ul>						
<b>Location</b>	<p><b>CBS</b> – Portals Building, Washington D.C. (Program Office) and ED Central Processing facility, Lockheed Martin Data Systems, 11700 Montgomery Road, Beltsville, MD 20705. (Processing)</p> <p><b>CDS</b> – CDSI, Rockville, MD % &amp; Utica, NY</p> <p><b>LOS</b> – EDS Montgomery, AL &amp; Plano, TX</p> <p><b>PGRFMS</b> – GSA ROB3 Building 7<sup>th</sup> &amp; D Streets, SE, Washington, D.C. (Program Office) and ED Central Facility, Beltsville, MD. (Processing)</p>						
<b>Headcount</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">Government (FY98)</td> <td style="text-align: right;">5</td> </tr> <tr> <td>Contractor (FY97) *</td> <td style="text-align: right;">6</td> </tr> <tr> <td>Total</td> <td style="text-align: right;">11</td> </tr> </table> <p>*Contractor figure does not include data for PGRFMS. No data was provided for this system.</p>	Government (FY98)	5	Contractor (FY97) *	6	Total	11
Government (FY98)	5						
Contractor (FY97) *	6						
Total	11						
<b>Budget</b>	<b>\$7,925,000</b>						

**Table 2-2. Function 2: Award Processing**

<b>Function</b>	<b>Waiver Tracking:</b> Monitoring three types of waiver applications from institutions. The three types of waivers are: under-utilization penalty waivers, Federal Work Study (FWS) and Student Educational Opportunity Grant (SEOG) matching waivers, and 5% FWS community service expenditure waivers.						
<b>Processes</b>	<ul style="list-style-type: none"> <li>• Track FWS/SEOG Waivers</li> <li>• Track Underutilization/Comm Service Waivers</li> </ul>						
<b>Location</b>	<b>CBS</b> – Portals Building, Washington D.C. (Program Office), CBS processing takes place at the ED Central Processing facility run by Lockheed Martin Data Systems, 11700 Montgomery Road, Beltsville, MD 20705.						
<b>Headcount</b>	<table> <tr> <td>Government (FY98)</td> <td>1</td> </tr> <tr> <td>Contractor (FY97)</td> <td>1</td> </tr> <tr> <td>Total</td> <td>2</td> </tr> </table>	Government (FY98)	1	Contractor (FY97)	1	Total	2
Government (FY98)	1						
Contractor (FY97)	1						
Total	2						
<b>Budget</b>	<b>\$621,000</b>						

**Table 2-3. Function 3: Waiver Tracking**

<b>Function</b>	<b>Application Processing &amp; Management:</b> The processing of FAFSA original and renewal application data and also including verification, eligibility computations and application image storage.						
<b>Processes</b>	<p><b>CPS</b></p> <ul style="list-style-type: none"> <li>• Provide Institution Info (CPS &amp; MDE)</li> <li>• Store Image (CPS)</li> <li>• Process Electronic Applications (CPS)</li> <li>• Verify Data (CPS &amp; MDE)</li> <li>• Process Renewal Applications</li> <li>• Compute Eligibility (CPS)</li> </ul> <p><b>MDE</b></p> <ul style="list-style-type: none"> <li>• Application Editing (MDE)</li> <li>• Application Entry (MDE)</li> <li>• Application Forwarding (MDE)</li> </ul> <p><b>NSLDS</b></p> <ul style="list-style-type: none"> <li>• Borrower/Student Information Interface Support</li> </ul>						
<b>Location</b>	<p><b>CPS</b> – National Computer Systems, Iowa City, Iowa General Electric(GE) Information Services (subcontractor). <b>MDE</b>– American College Testing Program (ACT), Iowa City, Iowa. <b>NSLDS</b> – Located at a CSC/GSA FEDCACS Datacenter in Meridian, CT.</p>						
<b>Headcount</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">Government (FY98)</td> <td style="text-align: right;">24</td> </tr> <tr> <td>Contractor (FY97)*</td> <td style="text-align: right;">6</td> </tr> <tr> <td>Total</td> <td style="text-align: right;">30</td> </tr> </table> <p>*Contractor figure does not include data for CPS and MDE. No data was provided for these systems.</p>	Government (FY98)	24	Contractor (FY97)*	6	Total	30
Government (FY98)	24						
Contractor (FY97)*	6						
Total	30						
<b>Budget</b>	<b>\$55,401,000</b>						

**Table 2-4. Function 4: Application Processing and Management**

<b>Function</b>	<b>School and State Payment Processing and Management:</b> The processing of drawdown payments to schools and state agencies for the Campus Based, Direct Loan, Pell Grant and SSIG financial aid programs.						
<b>Processes</b>	<p><b>CBS</b></p> <ul style="list-style-type: none"> <li>• Create Accounting Transaction</li> <li>• Transmit Accounting Transaction</li> <li>• Update Obligation Totals</li> </ul> <p><b>CDS</b></p> <ul style="list-style-type: none"> <li>• Generate Payment Reports</li> <li>• Convert Servicer Transactions</li> <li>• Process SF1166 Forms</li> <li>• Perform Reconciliation FARS/Servicer</li> <li>• Perform Reconciliation FARS/Treasury</li> </ul> <p><b>FFEL</b></p> <ul style="list-style-type: none"> <li>• Manage Federal Claims &amp; Loan Assignments</li> </ul> <p><b>LOS</b></p> <ul style="list-style-type: none"> <li>• Process Drawdown Payment</li> </ul> <p><b>PGRFMS</b></p> <ul style="list-style-type: none"> <li>• Pell Payment Management</li> </ul>						
<b>Location</b>	<p><b>CBS</b> – Portals Building, Washington D.C. (Program Office) ED Central Processing facility, Lockheed Martin Data Systems, 11700 Montgomery Road, Beltsville, MD. (Processing)</p> <p><b>CDS</b> – CDSI, Rockville, MD</p> <p><b>FFEL</b> – E-Systems, Greenville Division, P.O. Box 6056, Greenville, TX 75403</p> <p><b>LOS</b> – EDS Loan Origination Center, Montgomery, AL. Processing facilities Plano, TX</p> <p><b>PGRFMS</b> – ED Building ROB3, Washington D.C. (Program Office) &amp; ED Central Processing Facility, Beltsville, MD</p>						
<b>Headcount</b>	<table> <tr> <td>Government (FY98)</td> <td>7</td> </tr> <tr> <td>Contractor (FY97) *</td> <td>18</td> </tr> <tr> <td>Total</td> <td>25</td> </tr> </table> <p>*Contractor figure does not include data for LOS and PGRFMS. No data was provided for these systems.</p>	Government (FY98)	7	Contractor (FY97) *	18	Total	25
Government (FY98)	7						
Contractor (FY97) *	18						
Total	25						
<b>Budget</b>	<b>\$10,909,000</b>						

**Table 2-5. Function 5: School and State Payment Processing and Management**

<b>Function</b>	<b>Defaulted Debt Management and Collections:</b> The collection and management of defaulted Title IV financial aid. This includes the recording of new defaulted debt, the skip tracing of borrowers, referrals to the Department of Justice, the processing of offsets to the Internal Revenue Service and other defaulted debt related tasks.						
<b>Processes</b>	<p><b>CBS</b></p> <ul style="list-style-type: none"> <li>• Default Reduction Assistance Program</li> </ul> <p><b>CDS</b></p> <ul style="list-style-type: none"> <li>• Loan Data Processing of Defaulted Loans</li> </ul> <p><b>FFEL</b></p> <ul style="list-style-type: none"> <li>• Manage Defaulted Debt Accounting</li> <li>• Manage Income Contingent Repayment Plan</li> <li>• Manage Billing</li> <li>• Manage Collection Agency Reporting</li> <li>• Administrative Wage Garnishment</li> <li>• Manage Collections Management</li> <li>• Federal Defaulter Management</li> <li>• Federal Offset Management</li> <li>• Letters management</li> <li>• Pre-Claims Skip Trace</li> <li>• Loan Rehabilitation/Consolidation Management</li> <li>• Manage Research and Collections Help</li> <li>• Manage Reporting and Control</li> <li>• Manage Research</li> <li>• Manage Department of Justice Claims</li> <li>• Manage IRS Skip trace</li> <li>• Credit Bureau Reporting</li> </ul> <p><b>LSS</b></p> <ul style="list-style-type: none"> <li>• Skip Trace</li> <li>• Transfer Defaulted Loans to DCS</li> </ul>						
<b>Location</b>	<p><b>CDS</b> – CDSI, Rockville, MD &amp; Utica, NY</p> <p><b>FFEL</b> - Data Processing for the FFEL system is performed at E-Systems, Greenville Division, P.O. Box 6056, Greenville, TX 75403.</p> <p><b>LSS</b> - CDSI, Rockville, MD &amp; Utica, NY</p>						
<b>Headcount</b>	<table> <tr> <td>Government (FY98)</td> <td>11</td> </tr> <tr> <td>Contractor (FY97)</td> <td>117</td> </tr> <tr> <td>Total</td> <td>128</td> </tr> </table>	Government (FY98)	11	Contractor (FY97)	117	Total	128
Government (FY98)	11						
Contractor (FY97)	117						
Total	128						
<b>Budget</b>	<b>\$20,753,000</b>						

**Table 2-6. Function 6: Defaulted Debt Management and Collections**

<b>Function</b>	<b>Lender and Guaranty Agency Payment Processing:</b> The management of guaranty agency information and funding. While this function includes payment of administrative and reinsurance fees in the current FFELP configuration, this process only includes the information about participating guarantee agencies and their general funding information.						
<b>Processes</b>	<p><b>FFEL</b></p> <p><b>Guaranty Agency Processing</b></p> <ul style="list-style-type: none"> <li>• Calculate LIR, Administrative Expense Allowance</li> <li>• Manage GA Form 1130 Data Entry</li> <li>• Perform 1130 Reasonability Test</li> <li>• Perform 1130 Edits</li> <li>• Verify Data</li> <li>• Make Payment Adjustments</li> <li>• Approve AEA &amp; Reinsurance Fees</li> <li>• Process GA Payment</li> <li>• Manage Form 1189 Processing</li> <li>• Provide Statements of Account</li> </ul> <p><b>Lender Processing</b></p> <ul style="list-style-type: none"> <li>• Process Lender Payments</li> <li>• Manage 799 Data</li> <li>• Manage 799 Forms and Postings</li> <li>• Manage Lender Interest Payments</li> </ul>						
<b>Location</b>	This is done as part of the FFEL system managed by E-Systems, Greenville Division, P.O. Box 6065, Greenville, TX.						
<b>Headcount</b>	<table> <tr> <td>Government (FY98)</td> <td>3</td> </tr> <tr> <td>Contractor (FY97)</td> <td>37</td> </tr> <tr> <td>Total</td> <td>40</td> </tr> </table>	Government (FY98)	3	Contractor (FY97)	37	Total	40
Government (FY98)	3						
Contractor (FY97)	37						
Total	40						
<b>Budget</b>	<b>\$3,833,000</b>						

**Table 2-7. Function 7: Lender and Guaranty Agency Payment Processing**

<b>Function</b>	<b>Consolidation Processing:</b> The processing of consolidation applications for Direct Loans consolidating FFEL and other loans. Also consists of the processing of credit checks, the verification of all loans covered by a given loan consolidation agreement, and the payoff of current loan holders.						
<b>Processes</b>	<b>CDS</b> <ul style="list-style-type: none"> <li>• Loan Booking Info</li> </ul> <b>LCS</b> <ul style="list-style-type: none"> <li>• Process Consolidation Application</li> <li>• Process PLUS Credit Check</li> <li>• Process Fast Track Consolidation</li> <li>• Process Verification Certificate</li> <li>• Process Certification Issues</li> <li>• Process Returned Verification Certificate</li> <li>• Process Promissory Note</li> </ul> <b>LSS</b> <ul style="list-style-type: none"> <li>• Loan Adjustment, Consolidation &amp; Transfer</li> </ul>						
<b>Location</b>	<b>CDS</b> –CDSI, Rockville, MD & Utica, NY <b>LCS</b> – Processing is done in Plano, TX with production and customer service done in Louisville, KY. <b>LSS</b> – CDSI, Rockville, MD & Utica, NY						
<b>Headcount</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 80%;">Government (FY98)</td> <td style="text-align: right;">4</td> </tr> <tr> <td>Contractor (FY97) *</td> <td style="text-align: right;">15</td> </tr> <tr> <td>Total</td> <td style="text-align: right;">19</td> </tr> </table> <p>*Contractor figure does not include data for LCS. No data was provided for this system.</p>	Government (FY98)	4	Contractor (FY97) *	15	Total	19
Government (FY98)	4						
Contractor (FY97) *	15						
Total	19						
<b>Budget</b>	<b>\$14,180,000</b>						

**Table 2-8. Function 8: Consolidation Processing**

<b>Function</b>	<b>Loan Origination Management:</b> The origination of direct loans by initiating loan records, creating a promissory note and making a disbursement.						
<b>Processes</b>	<p><b>CPS</b></p> <ul style="list-style-type: none"> <li>• EDEExpress Aid Origination</li> </ul> <p><b>LCS</b></p> <ul style="list-style-type: none"> <li>• Book Loan</li> </ul> <p><b>LOS</b></p> <p><b>Manage Loan Information</b></p> <ul style="list-style-type: none"> <li>• Process Credit Check</li> <li>• Process Loan Details</li> <li>• Maintain School Information</li> <li>• Maintain Participant Information</li> </ul> <p><b>Manage Disbursement</b></p> <ul style="list-style-type: none"> <li>• Process Drawdown</li> <li>• Book Loan</li> <li>• Process Loan Disbursement Information</li> </ul> <p><b>Manage Promissory Note</b></p> <ul style="list-style-type: none"> <li>• Process Promissory Note</li> <li>• Process Signed Promissory Note</li> </ul>						
<b>Location</b>	<p><b>LCS</b> – Processing is done in Plano, TX with production and customer service done in Louisville, KY.</p> <p><b>LOS</b> – Processing is done in Plano, TX, production and customer service is done in Montgomery, AL.</p>						
<b>Headcount</b>	<table> <tr> <td>Government (FY98)</td> <td>6</td> </tr> <tr> <td>Contractor (FY97) *</td> <td>0</td> </tr> <tr> <td>Total</td> <td>6</td> </tr> </table> <p>*Contractor figure does not include data for LCS and LOS. No data was provided for these systems.</p>	Government (FY98)	6	Contractor (FY97) *	0	Total	6
Government (FY98)	6						
Contractor (FY97) *	0						
Total	6						
<b>Budget</b>	<b>\$18,848,000</b>						

**Table 2-9. Function 9: Loan Origination Management**

<b>Function</b>	<b>Customer Service:</b> The processing of customer contacts through various types of channels including but not limited to voice, email, Web-interface, facsimile, and postal mail. The largest body of activity in this function concerns aid participants inquiring about Title IV programs and accounts. It may also include schools, lenders and other aid organizations interfacing with ED on their participation in Title IV programs.						
<b>Processes</b>	<b>CBS, CDS, CPS, FFEL, LCS, LOS, LSS, PGRFMS</b> <ul style="list-style-type: none"> <li>• Customer Services</li> </ul>						
<b>Location</b>	The location of customer service is usually where the current system contract resides. However, the contractor can contract out the customer service function and locate other branches. The implication is that while the respective current system contractor provides the bulk of the customer service function at their respective site, other customer service areas may be established, either as branches or as subcontractors.						
<b>Headcount</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 80%;">Government (FY98)</td> <td style="text-align: right;">12</td> </tr> <tr> <td>Contractor (FY97) *</td> <td style="text-align: right;">731</td> </tr> <tr> <td>Total</td> <td style="text-align: right;">742</td> </tr> </table> <p>*Contractor figure does not include data for CPS. No data was provided for these systems.</p>	Government (FY98)	12	Contractor (FY97) *	731	Total	742
Government (FY98)	12						
Contractor (FY97) *	731						
Total	742						
<b>Budget</b>	<b>\$34,253,000</b>						

**Table 2-10. Function 10: Customer Service**

<b>Function</b>	<b>Loan Servicing:</b> The servicing and administration of direct loan portfolios and their status, repayment schedules and transfers.						
<b>Processes</b>	<p><b>CDS</b></p> <ul style="list-style-type: none"> <li>• Loan Data Processing</li> </ul> <p><b>FFEL</b></p> <ul style="list-style-type: none"> <li>• Collections Management (Billing)</li> </ul> <p><b>LSS</b></p> <ul style="list-style-type: none"> <li>• Establish Initial Direct Loan Repayment Plans</li> <li>• Update Repayment Plans</li> </ul>						
<b>Location</b>	<p><b>CDS</b> – CDSI, Rockville, MD &amp; Utica, NY</p> <p><b>FFEL</b> – E-Systems, Greenville, TX.</p> <p><b>LSS</b> – Processing CDSI, Rockville, MD, production and customer service is done in Utica, NY.</p>						
<b>Headcount</b>	<table> <tr> <td>Government (FY98)</td> <td>10</td> </tr> <tr> <td>Contractor (FY97)</td> <td>102</td> </tr> <tr> <td>Total</td> <td>112</td> </tr> </table>	Government (FY98)	10	Contractor (FY97)	102	Total	112
Government (FY98)	10						
Contractor (FY97)	102						
Total	112						
<b>Budget</b>	<b>\$38,446,000</b>						

**Table 2-11. Function 11: Loan Servicing**

<b>Function</b>	<b>Student Status Confirmation Reporting:</b> The tracking of student borrower enrollment data to facilitate the processing of Student Status Confirmation Reports (SSCRs) and other functionality related to student enrollment.						
<b>Processes</b>	<p><b>LSS</b></p> <ul style="list-style-type: none"> <li>• Loan Status Administration</li> </ul> <p><b>NSLDS</b></p> <ul style="list-style-type: none"> <li>• Manage SSCR Information</li> </ul> <p><b>PGRFMS</b></p> <ul style="list-style-type: none"> <li>• Maintain Student Eligibility</li> </ul>						
<b>Location</b>	<p><b>LSS</b> – CDSI, Rockville, MD &amp; Utica, NY</p> <p><b>NSLDS</b> – Program Offices are located at the Department of Education, Building ROB3, 7<sup>th</sup> &amp; D Streets, SW, Washington, DC.. NSLDS data center is located in the Computer Sciences Corporation (CSC) facility under the GSA FEDCACS contract. The facility is located in Meridian, Ct.</p> <p><b>PGRFMS</b> – GSA ROB3 Building 7<sup>th</sup> &amp; D Streets, SE, Washington, D.C. (Program Office) and ED Central Facility, Beltsville, MD. (Processing)</p>						
<b>Headcount</b>	<table> <tr> <td>Government (FY98)</td> <td>5</td> </tr> <tr> <td>Contractor (FY97)</td> <td>17</td> </tr> <tr> <td>Total</td> <td>22</td> </tr> </table>	Government (FY98)	5	Contractor (FY97)	17	Total	22
Government (FY98)	5						
Contractor (FY97)	17						
Total	22						
<b>Budget</b>	<b>\$8,470,000</b>						

**Table 2-12. Function 12: Student Status Confirmation Reporting**

<b>Function</b>	<b>School, Guaranty Agency, Lender and Sevicer Default Calculation &amp; Information Support:</b> The calculation of default rates for institutions and aid organizations and the processing of borrowing default information.						
<b>Processes</b>	<p><b>NSLDS</b></p> <ul style="list-style-type: none"> <li>• Provide Default Rate backup Data</li> <li>• Calculate and Maintain Default Rates</li> </ul> <p><b>PEPS</b></p> <ul style="list-style-type: none"> <li>• Monitor School Default rates</li> <li>• Record GA &amp; Lender Default Rates</li> </ul>						
<b>Location</b>	<p><b>NSDLS</b> – Located at a CSC/GSA FEDCACS Datacenter in Meridian, CT.</p> <p><b>PEPS</b> – Both the Program Offices and the processing center are located in the Department of Education’s ROB3 Building, 7<sup>th</sup> &amp; D Street SW, Washington, DC.</p>						
<b>Headcount</b>	<table> <tr> <td>Government (FY98)</td> <td>5</td> </tr> <tr> <td>Contractor (FY97)</td> <td>17</td> </tr> <tr> <td>Total</td> <td>22</td> </tr> </table>	Government (FY98)	5	Contractor (FY97)	17	Total	22
Government (FY98)	5						
Contractor (FY97)	17						
Total	22						
<b>Budget</b>	<b>\$3,784,000</b>						

**Table 2-13. Function 13: School, GA, Lender and Sevicer Default Calculation & Information Support**

<b>Function</b>	<b>School Eligibility Data Management:</b> The maintenance of school audit and review data and certification application data support. This function also includes school sanction and appeal data.						
<b>Processes</b>	<p><b>NSLDS</b></p> <ul style="list-style-type: none"> <li>• Calculate &amp; Maintain Default Rates</li> </ul> <p><b>PEPS</b></p> <ul style="list-style-type: none"> <li>• Manage Appeal</li> <li>• Record and Update Institution Information</li> <li>• Monitor Eligibility &amp; Certification</li> <li>• Monitor Default rate</li> <li>• Monitor Program Participation</li> </ul>						
<b>Location</b>	<p><b>NSLDS</b> – Located at a CSC/GSA FEDCACS Datacenter in Meridian, CT.</p> <p><b>PEPS</b> – ED, Building ROB 3, Washington, DC.</p>						
<b>Headcount</b>	<table> <tr> <td>Government (FY98)</td> <td>3</td> </tr> <tr> <td>Contractor (FY97)</td> <td>9</td> </tr> <tr> <td>Total</td> <td>12</td> </tr> </table>	Government (FY98)	3	Contractor (FY97)	9	Total	12
Government (FY98)	3						
Contractor (FY97)	9						
Total	12						
<b>Budget</b>	<b>\$2,180,000</b>						

**Table 2-14. Function 14: School Eligibility Data Management**

<b>Function</b>	<b>Guaranty Agency, Lender, Servicer Eligibility Data and Support:</b> The maintenance of GA, lender and servicer audit and review data and information support. This function also supports the processing of lender participation questionnaires.						
<b>Processes</b>	<p><b>NSLDS</b></p> <ul style="list-style-type: none"> <li>• Calculate &amp; maintain Default Rates</li> </ul> <p><b>PEPS</b></p> <ul style="list-style-type: none"> <li>• Monitor GA &amp; Lender &amp; Servicer Participation</li> <li>• Record GA Lender and Servicer Information</li> </ul>						
<b>Location</b>	<p><b>NSLDS</b> – Located at a CSC/GSA FEDCACS Datacenter in Meridian, CT.</p> <p><b>PEPS</b> – ED, Building ROB 3, Washington, DC.</p>						
<b>Headcount</b>	<table> <tr> <td>Government (FY98)</td> <td>2</td> </tr> <tr> <td>Contractor (FY97)</td> <td>8</td> </tr> <tr> <td>Total</td> <td>10</td> </tr> </table>	Government (FY98)	2	Contractor (FY97)	8	Total	10
Government (FY98)	2						
Contractor (FY97)	8						
Total	10						
<b>Budget</b>	<b>\$2,021,000</b>						

**Table 2-15. Function 15: Guaranty Agency, Lender, Servicer Eligibility Data and Support**

<b>Function</b>	<b>System Chargeback Billing and Invoice Management:</b> The calculation, invoicing and billing of system usage for the purpose of collecting payments from current Title IV system users.
<b>Processes</b>	<b>NSLDS</b> <ul style="list-style-type: none"> <li>• Manage Chargeback Information</li> </ul> <b>TIVWAN</b> <ul style="list-style-type: none"> <li>• Billing and Invoice management</li> </ul>
<b>Location</b>	<b>NSLDS</b> – FEDCACs/CSC, Meridian, CT. <b>TIVWAN</b> – General Electric Information Systems (GEIS)
<b>Headcount</b>	Government (FY98)            0 Contractor (FY97) *        0 Total                                0  *Contractor figure does not include data for TIVWAN. No data was provided for this system.
<b>Budget</b>	<b>\$522,000</b>

**Table 2-16. Function 16: System Chargeback Billing and Invoice Management**

<b>Function</b>	<b>Accounting and Financial Management:</b> The reconciliation of program and organization account information to balance and account for all funding passing through ED Title IV systems.						
<b>Processes</b>	<p><b>CBS</b></p> <ul style="list-style-type: none"> <li>• Close-Out Management</li> </ul> <p><b>CDS</b></p> <ul style="list-style-type: none"> <li>• CDS Financial Accounting and Reconciliation System Processing</li> </ul> <p><b>FFEL</b></p> <ul style="list-style-type: none"> <li>• Debt Management and Collections Administration Auditing</li> <li>• Manage Guaranty Agency Funds</li> <li>• Manage Interest Payments</li> <li>• Manage Accounting Support</li> </ul> <p><b>LCS</b></p> <ul style="list-style-type: none"> <li>• System Balancing</li> </ul> <p><b>LOS</b></p> <ul style="list-style-type: none"> <li>• Processing Unused funds</li> <li>• CDS System Balancing</li> <li>• Perform School Reconciliation</li> </ul> <p><b>LSS</b></p> <ul style="list-style-type: none"> <li>• System Balancing</li> </ul> <p><b>PGRFMS</b></p> <ul style="list-style-type: none"> <li>• Create &amp; Maintain Authorization levels</li> <li>• Process Administrative Allowance Payment Data</li> <li>• Manage Contractor Billing Information</li> </ul>						
<b>Location</b>	<p><b>CBS</b> – Portals Building, Washington D.C.</p> <p><b>CDS</b> – CDSI, Rockville, MD</p> <p><b>FFEL</b> – E-Systems, Greenville, TX.</p> <p><b>LCS</b> – Louisville, KY and Plano, TX.</p> <p><b>LOS</b> – EDS, Montgomery, AL and Plano, TX.</p> <p><b>LSS</b> – CDSI, Rockville, MD and Utica, MD. PGRFMS – Processing takes place at the ED Central Facility, Lockheed Data Systems, Greenbelt, MD</p> <p><b>PGRFMS</b> – ED Central Facility, Beltsville, MD</p>						
<b>Headcount</b>	<table> <tr> <td>Government (FY98)</td> <td>17</td> </tr> <tr> <td>Contractor (FY97) *</td> <td>71</td> </tr> <tr> <td>Total</td> <td>88</td> </tr> </table> <p>*Contractor figure does not include data for LCS, LOS, and PGRFMS. No data was provided for these systems.</p>	Government (FY98)	17	Contractor (FY97) *	71	Total	88
Government (FY98)	17						
Contractor (FY97) *	71						
Total	88						
<b>Budget</b>	<b>\$24,790,000</b>						

**Table 2-17. Function 17: Accounting and Financial Management**

<b>Function</b>	<b>Borrower Repayment Processing:</b> Processing of payments for defaulted debt and Direct Loans.						
<b>Processes</b>	<p><b>CDS</b></p> <ul style="list-style-type: none"> <li>• Payment Processing</li> </ul> <p><b>FFEL</b></p> <ul style="list-style-type: none"> <li>• Defaulted Debt Payments Management (National Payment Center)</li> </ul> <p><b>LSS</b></p> <ul style="list-style-type: none"> <li>• Payment Receipt and Application</li> </ul>						
<b>Location</b>	<p><b>CDS/LSS</b> – CDSI, Rockville, MD and Utica, NY.</p> <p><b>FFEL</b> – E-Systems, Greenville, TX.</p>						
<b>Headcount</b>	<table> <tr> <td>Government (FY98)</td> <td>7</td> </tr> <tr> <td>Contractor (FY97)</td> <td>73</td> </tr> <tr> <td>Total</td> <td>80</td> </tr> </table>	Government (FY98)	7	Contractor (FY97)	73	Total	80
Government (FY98)	7						
Contractor (FY97)	73						
Total	80						
<b>Budget</b>	<b>\$24,790,000</b>						

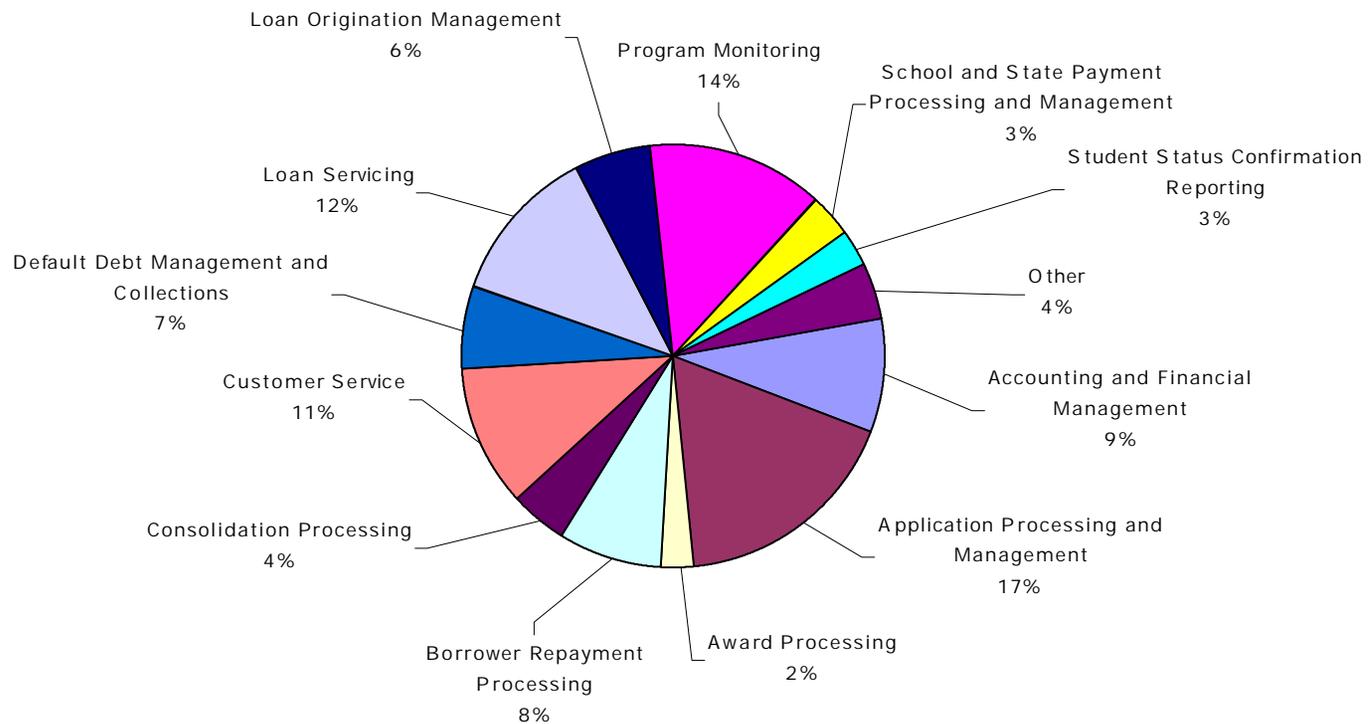
**Table 2-18. Function 18: Borrower Repayment Processing**

<b>Function</b>	<b>Program Monitoring</b> - The monitoring by authorized parties of disbursed Title IV financial aid funds to ensure that the correct amounts have been disbursed to eligible recipients, that the organizations involved in disbursing aid are eligible to participate in Title IV programs, and that all parties involved in the financial aid delivery process are conforming to program rules and maintaining adequate financial controls.						
<b>Processes</b>	<p><b>NSLDS</b></p> <ul style="list-style-type: none"> <li>• Title IV Program Research and Policy Analysis and Support</li> </ul> <p><b>PEPS</b></p> <ul style="list-style-type: none"> <li>• Institution Eligibility and Data Management</li> <li>• Accreditor Information Maintenance</li> <li>• GA, Lender, Servicer Information Maintenance</li> </ul> <p>Note: All Title IV systems with the exception of TIVWAN and MDE support Program Monitoring to a lesser extent. NSLDS &amp; PEPS however, dedicate a majority of their functionality to this function and are therefore highlighted above.</p>						
<b>Location</b>	<p><b>NSLDS</b> – FEDCACCS/CSC, Meridian, CT. and the NSLDS Program Office, ED, Building ROB 3, 7<sup>th</sup> &amp; D St, SW, Washington, DC.</p> <p><b>PEPS</b> – ED, Building ROB 3, Washington, DC.</p>						
<b>Headcount</b>	<table> <tr> <td>Government (FY98)</td> <td>29</td> </tr> <tr> <td>Contractor (FY97)</td> <td>128</td> </tr> <tr> <td>Total</td> <td>157</td> </tr> </table> <p>*Contractor figure does not include data for CPS, LCS, LOS, PGRFMS and TIVWAN. No data was provided for these systems.</p>	Government (FY98)	29	Contractor (FY97)	128	Total	157
Government (FY98)	29						
Contractor (FY97)	128						
Total	157						
<b>Budget</b>	<b>\$43,317,000</b>						

**Table 2-19. Function 19: Program Monitoring**

The pie chart in Figure 2-2 below shows the relative cost distribution among the 19 work view functions. The section labeled “Other” represents the following work functions, whose budgets combined equaled 4% of the overall budget.

- FISAP Processing
- GA, Lender, Servicer Eligibility Data and Support
- Lender and GA Payment Processing
- School Eligibility and Data Management
- School, GA, Lender and Servicer Default Calculation and Information Support
- System Chargeback and Invoice Management
- Waiver Tracking



**Figure 2-2. Business Functions Cost Breakdown**

## 2.3 Comparison with Architecture Principles

This subsection compares the current Title IV systems work view with related architecture principles defined in the SFAP's *Enterprise Information Technology Framework: Business Drivers and Architecture Principles* document. Each principle is listed along with associated comments highlighting areas where the current systems do not fully support the principle.

**Principle 1. The Architecture Must Support the Business:** The enterprise architecture and standards will be designed to (1) support and optimize the mission of SFA, (2) be highly flexible to accommodate future business changes and (3) help ensure the overall success of the SFAP business.

### Comments:

Because of the lack of an overall, organization-wide architectural framework, the current Title IV systems were developed independently of one another, supporting individual Title IV program requirements rather than the larger SFAP mission. Therefore, beyond supporting the Title IV program for which they were built, it is difficult for the current Title IV systems to support the overall SFAP mission. In addition, due to the lack of conformity between the systems, it has been difficult to uniformly accommodate changing needs. These competing priorities have made it difficult for the current Title IV systems to adapt to changing business and technological needs.

### Systems Affected:

CBS, CDS, CPS, EDExpress, FFEL, LCS, LOS, LSS, MDE, NSLDS, PEPS, PGRFMS, TIVWAN

**Principle 21. Event Driven Processing:** Where practical, application design shall be event driven, employing a real-time processing methodology versus batch processing.

### Comments:

Other than PEPS, the current systems are primarily driven by batch processes.

### Systems Affected:

CBS, CDS, CPS, EDExpress, FFEL, LCS, LOS, LSS, MDE, NSLDS, PGRFMS, TIVWAN

**Principle 25. Electronic Commerce:** Standards-based electronic links will be the preferred means of transacting business and communicating with partners and customers as required.

### Comments:

Most SFAP systems do not support accepted data format and security standards required to support Web-browser-based applications. However, some systems, e.g., LSS and NSLDS, are currently incorporating limited Web enabled access to their systems. In addition, FFELP

is also mapping current transaction formats to Electronic Data Interchange (EDI) standards. The CPS system has implemented an Internet application, FAFSA on the Web, which processes student financial aid applications via the Internet.

**Systems Affected:**

CBS, CDS, CPS, EDEExpress, FFEL, LCS, LOS, LSS, MDE, NSLDS, PEPS, PGRFMS, TIVWAN

**Principle 26. Common IT infrastructure:** SFAP will implement a common IT infrastructure for its systems. Applications will operate on this infrastructure.

**Comments:**

SFAP does not currently have a common IT Infrastructure. Each SFAP system operates in an independently designed and implemented technical environment.

**Systems Affected:**

CBS, CDS, CPS, EDEExpress, FFEL, LCS, LOS, LSS, MDE, NSLDS, PEPS, PGRFMS, TIVWAN

### 3. INFORMATION VIEW

The information view describes the information used by SFAP and the relationships among collections of information (data groups). Subsection 3.1 lists the different data groups used by SFAP and provides a cross-reference to the major applications within SFAP. Subsection 3.2 presents the relationship between the data groups and the physical databases where the information is maintained. It also documents the technology used in these databases. Subsection 3.3 compares the SFAP architecture principles to the information listed in the information view.

#### 3.1 Data Groups and Information Detail

Data Group	Definition
<b>Grants</b>	A form of Title IV assistance that does not require repayment. Grants generally fall into one of three program categories. Pell Grant – A federally funded grant for the most needy students. State Student Incentive Grant – A state administered federally funded grant for postsecondary student with demonstrated financial need. Supplemental Educational Opportunity Grant – Part of the Campus Based Programs administered directly by schools providing aid to students with exceptional financial need.
<b>Loans</b>	Long term low-interest capital obtained primarily through the government or government subsidized private lenders for the purpose of financing a student’s educational expenses. The types of Title IV loans include Federal Family Educational Loans, Direct Loans, and Perkins Loans.
<b>Transactions &amp; Ledgers</b>	All transactions representing funds sent to and received from schools and aid organizations containing all repayment transactions related to any form of Title IV aid owed to ED by aid participants. This includes federal Direct Loans, defaulted debt held by ED and other loans and grant overpayments held by or transferred to ED from other aid organizations.
<b>Aid Applications</b>	Application information submitted by an individual to request Federal financial aid. This data group also includes renewal applications and signature pages.
<b>Lenders, Guarantors &amp; Servicers</b>	A financial institution that provides money for loans, a federal or state entity that guarantees the repayment of student loans to the lenders or a servicer which performs the activities required to manage the loan for the lender.
<b>Accrediting Agencies</b>	A commercial organization that accepts or approves an educational institution.
<b>State Grant Agencies</b>	State institutions that receive funding from certain Title IV programs to distribute to students with pressing postsecondary financial needs.

**Table 3-1. SFAP Title IV System Data Groups**

<b>Data Group</b>	<b>Definition</b>
<b>Institutions</b>	An accredited higher education organization that participates, or desires to participate in a Title IV aid program offered by ED.
<b>Packages</b>	The set of grants, loans and work-study provided to an applicant.
<b>Participants</b>	A person attending an institution of higher education and who wishes to receive or has received Title IV aid. Includes the student's address, their financial aid eligibility and their current enrollment status.
<b>Promissory Notes</b>	A document signed by the borrower representing his promise to take and repay the specified funds at a given interest rate and according to the specified schedule.
<b>Resources</b>	Title IV system resources devoted to the information processing required for Title IV aid distribution.

**Table 3-1. SFAP Title IV System Data Groups (Cont'd.)**

Table 3-2 presents the relationships between the data groups defined in Table 3-1, and the SFAP application systems that use (create, read, update, and/or delete) this information.

<b>Data Groups</b>	Loans	Grants	Transaction & Ledgers	Aid Applications	Lenders and Guarantors and Servicers	Accrediting Agency	State Grant Agencies	Institution	Packages	Participants	Prom Notes	Resources
<b>Applications</b>												
Campus-Based System			X					X				
Central Processing System				X				X		X		
Central Database System	X		X		X			X		X		
EDEXpress	X	X	X	X				X	X	X	X	
Loan Consolidation System	X		X	X	X					X	X	
Loan Origination System	X		X					X		X	X	
Loan Servicing System	X		X					X		X		
Federal Family Education Loan Program	X		X		X			X		X		
Multiple Data Entry				X								
National Student Loan Data System	X	X			X			X		X		X
Pell Grant Recipient and Financial Management		X	X					X		X		
Postsecondary Education Participants System					X	X		X				
Title IV Wide Area Network					X			X				X
Procedure Application Report Tracking	X							X				
Perkins Loan Institutional Status Tracking			X					X				
Return Log System				X				X				
Default Reduction Assistance Program System	X							X		X		
Low-income School Directory System								X				
State Student Incentive Grant		X	X				X					

**Table 3-2. Application System to Data Group Relationships**

## 3.2 Data Location

Table 3-3 lists the main database(s) used by each of the current SFAP systems. The definitions of each column shown in the Table 3-3 are as follows:

- **System Name**                      The commonly used name or acronym for the SFAP systems.
- **Content**                              A brief description of the contents of the database or file.
- **Geographic Location(s)**              The location where the database or file physically resides.
- **Type**                                  The type of database or file system used.
- **Platform**                              The type of computer platform this database resides on.
- **Additional Notes**                      Any other clarifying notes which you feel will be helpful in characterizing the database or file.

The main sources for this information were:

- *Project EASI/ED Technical Vision and Target Architecture (TVTA) Report: Section3 - Current Systems.*
- Various current system documentation including system overviews and detailed design documents listed in Appendix E.

System Name	Content	Geographic Location(s)	Type	Platform	Additional Notes
CBS	FISAP data (application data and report data for the previous year). Collects tracking data.	Beltsville, MD	VSAM	Mainframe	Master File, Size - 140MB
CDS	Financial Accounting and Reporting System (FARS)	Rockville, MD	VSAM	Mainframe	Combined size of 60GB
	Used for non- accounting purposes		DB2	Mainframe	
CPS	Student application data	Iowa City, IA	DB2	Mainframe	Main DB. Combined size of 19GB
EDExpress	Cash Balance Information, Promissory Note Information and Student Status Confirmation Report (SSCR) files	Schools	MS Access	PC	
FFELP	Defaulted Debt Accounts, Billing data, Guaranty Agency (GA) Database, School information, Lender data, Image data, Payments Warehouse	Greenville, TX	IDMS, Informix	Mainframe	Size 120GB
LCS	Loan consolidation records	Plano, TX	Informix	Midrange	Combined Size 50GB
LOS	Loan disbursement records, loan origination records, promissory note data and verification certificate data	Plano, TX	Informix	Midrange	
LSS	Direct Loans data	Rockville, MD	Oracle RDB	Midrange	Size 428GB
MDE	Student aid application data, institution data	Mt. Vernon, IL	SQL, MS-Access, RRI FMD	Client/Server	
NSLDS	Database of selected Federal aid information and detail information on all Title IV student loan programs	Meriden, CT	DB2	Mainframe	Size 300GB (Production Environment only)
PEPS	Accreditation data, Institution data, GA, Lender and Servicer data	Meridan, CT	Oracle 7	Midrange	Size 3.5GB
PGRFMS	Pell grants disbursement, accounting and reconciliation data	Greenbelt, MD	VSAM	Mainframe	Size 15GB
TIVWAN	Customer and usage data	Iowa City, IA	VSAM, QSAM	Mainframe	

**Table 3-3. Data Location**

### 3.3 Comparison with Architecture Principles

This subsection compares the current Title IV systems information view with related architecture principles defined in the SFAP's *Enterprise Information Technology Framework: Business Drivers and Architecture Principles* document. Each principle is listed along with associated comments highlighting areas where the current systems do not fully support the principle.

**Principle 8. Access to Information:** Timely access to information and the tools and applications required to access and manipulate that information will be available to all individuals unless there is a specific, compelling reason to restrict access.

**Comments:**

Because each Title IV system was independently designed and developed with little or no coordination between the systems, each system maintains its own separate information repository. Because of this independent development, accounting, school, student and other data is not easily shared between systems. This also affects the ability of timely access to information.

**Systems Affected:**

CBS, CDS, CPS, EDEExpress, FFEL, LOS, LCS, LSS, MDE, NSLDS, PGRFMS, PEPS, TIVWAN

**Principle 10. Data Stewardship:** Data is a SFAP asset and does not belong to a particular business, program or individual. Individuals will be data stewards for particular periods of time but will not have overall ownership.

**Comments:**

Each SFAP system has developed its own database systems. Therefore, data is fragmented across systems and cannot be easily shared between systems or easily accessed from a single source. NSLDS acts as a central repository of some data extracted from other systems.

**Systems Affected:**

CBS, CDS, CPS, EDEExpress, FFEL, LOS, LCS, LSS, MDE, NSLDS, PEPS, PGRFMS, TIVWAN

**Principle 11. Data Capture and Replication:** Data will be captured only once at the source. All data will be stored in a single master "authoritative source".

**Comments:**

See comment provided for Principle 8.

**Principle 13. Operational Data Storage:** Replicated/aggregated copies of data (datamarts) will be created where required for performance or other reasons. (For example, operational data used for transaction processing shall be separated from analysis or decision support data by creating data warehouses from the operational databases as required.) Replicated copies of data will be updated from the master source as often as required by the applications.

**Comments:**

No data warehouses currently exist. In addition, some systems use the same data for both analysis and operation. For example, NSLDS functions as a decision support and analysis tools, but in addition, NSLDS is used for operational functions such as enrollment tracking and as part of the application processing and Direct Loan origination processes.

**Systems Affected**

CBS, CPS, EDExpress, FFEL, LOS, LCS, LSS, NSLDS, PEPS, PGRFMS

**Principle 14. Database Design:** All databases will use the standard SFAP entity relationship tool for database design and documentation of the data structures. The data models will be kept in a central repository and databases will share common data models and data definitions. A metadata dictionary (repository warehouse) defining fields and attributes will be maintained in a shared accessible area and used as the basis for the creation of data structures.

**Comments:**

Sterling Software's COOL product suite has been selected as the primary systems development environment for SFAP. Although some systems (CDS, LCS, LOS, and NSLDS) utilize a common Computer Aided Software Engineering (CASE) tool (IEF Composer) that is compatible with COOL products, none of the current Title IV systems have been designed around a common SFAP-wide data model or metadata dictionary.

**Systems Affected**

CBS, CDS, CPS, EDExpress, FFEL, LOS, LCS, LSS, MDE, NSLDS, PEPS, PGRFMS, TIVWAN

## 4. APPLICATION VIEW

The application view describes the current SFAP application systems. It illustrates the relationship of business functions as described in Section 2 to the current SFAP systems showing the functionality supported by specific applications.

Subsection 4.1 provides an inventory of the current systems used within SFAP. Subsection 4.2 provides a cross-reference of each application system with the major business functions defined in Section 2. Subsection 4.3 compares the SFAP architecture principles to the information listed in the application view.

### 4.1 Application Systems Inventory

An inventory of the current systems is presented in Table 4-1. The definitions of each column shown in the table are as follows:

<b>Application Acronym</b>	The commonly used abbreviation for the application.
<b>Application Name</b>	The full English name of the application.
<b>Description</b>	A brief description about the application.
<b>Type</b>	Denotes whether On-line (O), Batch (B) or both On-line and Batch (OB).
<b>Number Users</b>	The number of users (ED and Contractor staff).
<b>Language</b>	The language(s) the application is written in.
<b>Operating System</b>	The operating system on which the application runs.
<b>Age</b>	The age of the application in years.
<b>Where Run Specific Technology Platform</b>	The technology platform upon which this application runs.
<b>Where Run Location of Platform</b>	The location where the application runs.
<b>Number of Programs</b>	Number of executable programs in the application.
<b>Number of Subsystems</b>	Number of subsystems within each application.
<b>Change Requested</b>	Number of change requests in past year.
<b>Change Implemented</b>	Number of change requests implemented in past year.
<b>Failures</b>	Number of application failures in past year.
<b>Developers</b>	The organization that developed the application.
<b>Support</b>	The organization that supports the application.

#### Sources:

- *Project EASI/ED Technical Vision and Target Architecture (TVTA) Report - Section 3: Current Systems.*
- Various current system documentation including system overviews and detail design documents listed in Appendix E.

Application Acronym	Application Name	Description	Type	Number of Users	Language	Operating System	Age (years)	Where Run		Number Programs	Number of Subsystem	Developers	Support
								Specific Technology Platform	Location of Platform				
Note: N/A = Not Applicable, N/P = No Information Provided													
CBS	Campus-Based Programs System	To process applications for funds in the Federal Perkins Loan program, the Federal Work-Study program, and the Federal Supplemental Educational Opportunity Grant program. The processing includes correction processing, allocation and accounting processing, unexpended balances and reallocations, teacher cancellation payments, and end-of-year close-outs. The system also processes award letters, and obligates funds to institutions. It provides funds directly to participating schools per a statutory formula.	B	8-10 (including contractor staff)	COBOL II, Clipper 5.3	MVS/ESA PC	N/P	Amdahl 5995-1400A	Beltsville, MD	153	11	UAL	UAL
CDS	Central Database System	Central repository for loan/disbursement/participant inventory for Direct Loans, including detailed loan-level financial data reported from the Direct Loan servicer.	OB	50	IEF Cobol, COBOL II, C++	MVS/ESA	1	IBM CMOS	Rockville, MD	300	12	CDSI	CDSI

**Table 4-1. Application Inventory**

Application Acronym	Application Name	Description	Type	Number of Users	Language	Operating System	Age (years)	Where Run		Number Programs	Number of Subsystem	Developers	Support
								Specific Technology Platform	Location of Platform				
Note: N/A = Not Applicable, N/P = No Information Provided													
CPS	Central Processing System	Compute an applicant's eligibility for Title IV SFA. CPS receives the application data from the MDE contractors and transmits processed data back to the MDEs. The Student Aid Report (SAR) is printed and sent back to the applicant. Aid includes Pell Grants and FFEL student loans; perform matches against IRS, SSA and INS databases; produce summary data for States and institutions; support Electronic Data Exchange (EDE) and Integrated Student Aid Management System (ISAMS); calculate Estimated Family Contribution; Receive more than 10 million applications & correspondence annually.	B	10 Million	COBOL II	MVS	25	IBM 9672	Iowa City, IA	375	9	National Computer System	National Computer System
EDEExpress	EDEExpress	A microcomputer-based software package distributed by ED to schools to support aid packaging, Federal Pell Grant and Direct Loan origination, Student Status Confirmation Reporting (SSCR), and drawdown of data for use by schools.	O	N/P	Visual C++	DOS, Windows-95	N/P	IBM Compatible PC	Schools	N/P	1	National Computer System	National Computer System
LCS	Loan Consolidation System	LCS supports ED's Federal Direct Loan Program. It allows borrowers to consolidate multiple student loans from multiple sources into one direct consolidated loan, funded and serviced by ED. It provides mechanisms to convert DL and FFELP originated loans into DL loans.	OB	50	COBOL, C++, Microfocus Cobol, Power-Builder	HP-UX	2	HP-9000 T500	Plano, TX	60	4	EDS	EDS

**Table 4-1. Application Inventory (cont'd.)**

Application Acronym	Application Name	Description	Type	Number of Users	Language	Operating System	Age (years)	Where Run		Number Programs	Number of Subsystem	Developers	Support
								Specific Technology Platform	Location of Platform				
Note: N/A = Not Applicable, N/P = No Information Provided													
LOS	Loan Origination System	LOS is the initial entry point for new student loan information into the DL. LOS receives and processes all loan applications and disbursements and records the receipt of the completed promissory note. It provides the principle communication link with the schools to regulate the flow of information.	OB	100	Microfocus COBOL, Power-Builder, C	HP-UX, OS/2	2	HP-9000 T600	Plano, TX	150	5	EDS	EDS
LSS	Loan Servicing System	LSS role is to service Direct Loans while borrowers are in school, in deferment status, or in repayment. LSS receives all booked student loans from LOS and maintains them for their remaining life. It performs functions which include placing the loan into repayment at the proper time, billing the borrower, and tracking subsequent payments and delinquencies.	OB	100	COBOL II, Oracle, SQL, Visual C++, Visual Basic	Open VMS, MVS/XA, O/S400, AIX	4	DEC VAX 7610, Hitachi EX9000, VAX 7000, AS400, DEC Alpha, RISC 6000	Rockville, MD	1500	5	CDSI	CDSI
FFELP	Federal Family Education Loan Program	Provide program management, payment of federal reinsurance on defaulted loan claims submitted by guaranty agencies and collections on defaulted loans by GAs. Support collection process for federally guaranteed loans: receive defaulted loan data from GAs; interface with external systems, agencies, contractors for skip tracing; produce dunning notices; provide on-line support for collection agents; interface with private collection agencies; setup loan repayment schedules; produce loan payment notices; and track receipts.	OB	1900	COBOL II, Assembler, JCL, DML, DYL- Audit, CULPRIT	Operating System 390	22	IBM 9672/R52	Greenville, TX	2400	36	Raytheon	Raytheon

**Table 4-1. Application Inventory (cont'd.)**

Application Acronym	Application Name	Description	Type	Number of Users	Language	Operating System	Age (years)	Where Run		Number Programs	Number of Subsystem	Developers	Support
								Specific Technology Platform	Location of Platform				
Note: N/A = Not Applicable, N/P = No Information Provided													
MDE	Multiple Data Entry	Provide key entry and other automated and manual functions associated with SFAP application processing.	OB	50-400 (depending on processing cycle)	C/C++, Visual Basic, Nawk Scripting, PERL, EZC/DE2, Firmware	Windows 95/NT/98, Novell, Netware 3.12, Sun Solaris 2.6, DOS 6.x	N/P	SUN SPARC20, PC	Mt. Vernon, IL	73	6	RRI, ACS	RRI, ACS
NSLDS	National Student Loan Data System	To provide a central verification system to determine the eligibility of Title IV aid applicants with respect to prior aid received; to provide a comprehensive student loan data base; to provide a data base of borrower profile data to support research and analysis of student financial assistance program issues; to provide a data base of lender, school, GA and Federal direct loan program servicer profile data; to improve the quality and accessibility of student loan data; and to ease the burden on institutions administering Title IV loan programs and improve the efficiency of data transfer.	OB	1000	COBOL II, Rexx COBOL	MVS/ESA	3	IBM 9672	Meriden, CT	N/P	6	E-Systems	E-Systems

**Table 4-1. Application Inventory (cont'd.)**

Application Acronym	Application Name	Description	Type	Number of Users	Language	Operating System	Age (years)	Where Run		Number Programs	Number of Subsystem	Developers	Support
								Specific Technology Platform	Location of Platform				
Note: N/A = Not Applicable, N/P = No Information Provided													
PGR-FMS	Pell Grant Recipient and Financial Management	To generate obligation information and to monitor grant funds at both the institution and the recipient level. It does this by performing the following functions: authorize the distribution of funds through the participating institutions to permit payment of vouchers; monitoring the use of funds throughout the award year to permit reallocation of supplemental awards as necessary to correspond with student attendance; to verify institutional expenditures through comparing disbursements reported at the recipient level; by responding to informational requests from institutions, recipients, and others; and by defining, collecting, and reporting data to assist in the evaluation of the Pell Grant program and in projecting future needs.	OB	50	COBOL II, IBM-MVS COBOL, Dbase, SAS, ASM-H, PL1	MVS/ESA, SunOS	N/P	Amdahl 5990, SunOS	Greenbelt, MD Rockville, MD	250	5	CDSI	CDSI
PEPS	Post-secondary Education Participants System	To provide a management information system with consistent and reliable data, and flexible reporting concerning postsecondary institutions, accrediting bodies, state licensing agencies, lenders, and guarantors, for a large number of users with diverse business needs.	OB	800	Oracle PL/SQL, PRO*C and SQL*Plus, UNIX Scripts, Oracle Forms, Oracle Reports	HP-UX	5	HP-9000 T600	Meridan, CT	1	8	Computer Business Methods, Inc.	Computer Business Methods, Inc., and Computer Sciences Corporation (CSC)

**Table 4-1. Application Inventory (cont'd.)**

Application Acronym	Application Name	Description	Type	Number of Users	Language	Operating System	Age (years)	Where Run		Number Programs	Number of Subsystem	Developers	Support
								Specific Technology Platform	Location of Platform				
Note: N/A = Not Applicable, N/P = No Information Provided													
TIVWAN	Title IV Wide Area Network	Provide network and billing electronic data exchange (EDE) of Title IV SFAP information.	OB	7500	COBOL II	MVS/ESA	N/P	IBM 9672	Iowa City, IA	179	2	National Computer Systems	National Computer Systems
PART	Procedure Application Report Tracking	This system validates that skip tracing procedures are being followed by schools. Schools must submit a report documenting that they are following IRS skip tracking procedures. This system receives the report, processes the information, and validates compliance.	N/P	N/P	Clipper	DOS/MS-Windows	N/P	PC	Washington, D.C.	N/P	N/P	Universal Automation Labs	Universal Automation Labs
PLIST	Perkins Loan Institutional Status Tracking	This system tracks any funds received from Perkins Loan institutions that are either liquidating or are regarded as having "excess cash".	N/P	N/P	Clipper	DOS / MS-Windows	N/P	PC	Washington, D.C.	N/P	N/P	Universal Automation Labs	Universal Automation Labs
No Acronym	Return Log System	This system receives the FISAPs from schools processes them and creates a file that can then be transmitted to the Edit/Update subsystem of CBS.	N/P	N/P	N/P	N/P	N/P	N/P	Washington, D.C.	N/P	N/P	Universal Automation Labs	Universal Automation Labs
DRAP	Default Reduction Assistance Program System	This system receives list of defaulting Perkin Loan students from schools, and send out repayment notices to them on ED letter headed paper.	N/P	N/P	N/P	N/P	N/P	N/P	Washington, D.C.	N/P	N/P	Universal Automation Labs	Universal Automation Labs
No Acronym	Low-income School Directory System	Annually sends out letter to state department of education requesting that they send ED a list of the K-12 schools within their state that quantify as "low-income". These lists are consolidated into a report that is published each year and distributed to colleges.	N/P	N/P	N/P	N/P	N/P	N/P	Washington, D.C.	N/P	N/P	Universal Automation Labs	Universal Automation Labs

**Table 4-1. Application Inventory (cont'd.)**

Application Acronym	Application Name	Description	Type	Number of Users	Language	Operating System	Age (years)	Where Run		Number Programs	Number of Subsystem	Developers	Support
								Specific Technology Platform	Location of Platform				
Note: N/A = Not Applicable, N/P = No Information Provided													
SSIG	State Student Incentive Grant	ED/SFA/PTAS maintained a PC-based system that administers the SSIG program. This includes receiving application letters from states each year and calculating the allocation of SSIG funds that they should be allotted. States must also report annually on expenditures.	N/P	N/P	N/P	N/P	N/P	N/P	Washington, D.C.	N/P	N/P	N/P	N/P

**Table 4-1. Application Inventory (cont'd.)**

Table 4-2 provides an high-level overview of the operating environment for each of the current Title IV systems. It documents the technical standards with which each system complies. The definition of each column shown in the table is as follows:

- User Interface**      The software/hardware that "presents" the results of the application system's processing to the user (i.e. MS-Windows, 3270, Character Based.)
- Database**              The database or file management software used by the application.
- Application**          Any self-contained "package" software which has been made an integral part of the application.
- Language**              What programming language the application code is written in.
- Operating System**    The system software under which the application runs.
- Communication**      The transmission path for data communications. (Information in parenthesis shows the type of network data link technology.)
- Media**                  The protocol(s) used to control data communications related to this application.
- Communications**    The protocol(s) used to control data communications related to this application.
- Protocol**
- Other Services**        Any other aspects of the application which do not fall under any standards listed in a prior column.

<b>Standard</b>	User Interface	Database	Applications	Language	Operating System	Communication Media (Comm. Link)	Communication Protocol	System Management Software	Archive Management Software
<b>Applications</b>									
Note: N/A = Not Applicable, N/P = No Information Provided									
Campus-Based System	MS Windows, TN3270	VSAM	N/P	COBOL II, CIPPER 5.3	MVS/ESA	Ethernet, T-1, Frame Relay	TCP/IP, SNA	MVS/ESA	FDR/ABR
Central Database System	MS Windows, TN3221	DB2	Router	IEF COBOL, COBOL II, C++	MVS/ESA	Ethernet, Token Ring (Twisted Pair, ISDN, T1)	TCP/IP, SNA	MVS ESA, TMON	FDR

**Table 4-2. Technical Standards**

<b>Standard</b>	User Interface	Database	Applications	Language	Operating System	Communication Media (Comm. Link)	Communication Protocol	System Management Software	Archive Management Software
<b>Applications</b>									
Note: N/A = Not Applicable, N/P = No Information Provided									
Central Database System - FARS	N/P	VSAM	FARS	COBOL II	MVS/ESA	Token Ring	TCP/IP	MVS ESA, TMON	FDR
Central Processing System	MS Windows, TN3222	DB2	N/P	COBOL II	OS/390	Ethernet, Token Ring (Leased Line)	TCP/IP, SNA	Hear, Custom Software for System Performance Monitoring	FDR
EDExpress	MS Windows	N/P	N/P	Visual C++	Windows-3.x	N/P	N/P	N/P	N/P
Loan Consolidation System	MS Windows	Informix, MS Access	SNAP RJE, MS Access, CA-Unicenter	MicroFocus COBOL, PowerBuilder, C	HP-UX, NetWare, OS1	Ethernet (Twisted Pair)	TCP/IP, IPX/SPX	Harvest, CA-Unicenter, McAfee	Informix backup
Loan Origination System	MS Windows	Informix, MS-Access	SNAP RJE, MS-Access, CA - Unicenter	MicroFocus COBOL, PowerBuilder, C	HP-UX, Novell NetWare, OS/2	Ethernet (Twisted Pair)	TCP/IP, IPX/SPX	Harvest, CA-Unicenter, McAfee	Informix backup

**Table 4-2. Technical Standards (cont'd.)**

Standard	User Interface	Database	Applications	Language	Operating System	Communication Media (Comm. Link)	Communication Protocol	System Management Software	Archive Management Software
<b>Applications</b>									
Note: N/A = Not Applicable, N/P = No Information Provided									
Loan Servicing System	N/P	Oracle RDB	PowerBuilder, Cognos, Easytrieve, FileNET, Image Extender, SEQUEL Rep, CAS/BASEX erox, Robohelp, CA-7, CA-1, RACF, Easytrieve, SQL	COBOL II, Visual Basic, C++	Open VMS, MVS/XA, O/S400, AIX	FDDI Ring, Ethernet (CAT 5, UTP)	TCP/IP, DECNet	DEC PS	SLS Storage Linear System
Federal Family Education Loan Program	MS Windows, TN3270	IDMS, Informix	DYL - Audit, Informix ViewPoint	Assembler, JCL, COBOL II	OS390	Ethernet, Token Ring (56KB)	TCP/IP, SNA, NAS, NetView	CA-11, LandMark	FDR
Multiple Data Entry	N/P	SQL, MS-Access, RRI DMS	PowerScan, KIPP, Image Key, RRI FormsWork	Nawk Scripting, Visual Basic, C++, PERL, EZC/DE2, Firmware	Netware 3.12, Sun Solaris 2.6, NT 4.0	FDDI (CAT 5), Fast Ethernet	TCP/IP, IPX/SPX	Inventory Manager, Formworks Manager 2.03	ARC Serve

**Table 4-2. Technical Standards (cont'd.)**

<b>Standard</b>	<b>User Interface</b>	<b>Database</b>	<b>Applications</b>	<b>Language</b>	<b>Operating System</b>	<b>Communication Media (Comm. Link)</b>	<b>Communication Protocol</b>	<b>System Management Software</b>	<b>Archive Management Software</b>
<b>Applications</b>									
Note: N/A = Not Applicable, N/P = No Information Provided									
National Student Loan Data System	MS Windows, TN3270	DB2	N/P	COBOL II (IEF), Rexx	MVS/ESA	Token ring, PTP	TCP/IP, SNA	INFOMAN, NetView, OmegaMon, TMON	AC/SRS, FDR
Pell Grant Recipient and Financial Management	N/P	Oracle 7, VSAM	Easytrieve, SAS, MS-Access, FileAid	COBOL II, SAS, MVS COBOL, PL1, ASM-H	MVS/ESA, MVS/SP, SunOS	Ethernet (Twisted Pair)	TCP/IP, IPX, ACF/VTAM, ACF/TCAM, X.25 NCP, Kermit, ACF/SSP	CA-ENF, CA-OPSMVS, CA-1, CA90S, CA-MI-Integrity	Data Facility Data Set Services (DFDSS), FDR/CPK/ABR/FDRREOR
Postsecondary Education Participants System	MS Windows	Oracle 7	N/P	Oracle Developer 2000, PL/SQL and Pro*C	HP-UX	FDDI, Ethernet (CAT 5, Fiber)	TCP/IP	HP-UX, CA-Unicenter	CA-Unicenter
Title IV Wide Area Network	3270, VT100	Sequential, VSAM, DB2	Focus, DataAnalyzer, Easytrieve	COBOL II	MVS/ESA	Token ring	SNA/SDLC/SNI	Heat, WAN	FDR

**Table 4-2. Technical Standards (cont'd.)**

Table 4-3 lists itemized costs and headcounts for each of the current Title IV systems. The definitions of the TAFIM cost categories shown in the table are as follows:

<b>Hardware</b>	Processors, terminals, PCs, Workstations, Disk/Tape Drives, etc.
<b>Software</b>	Online Monitors, Database Management Systems (DBMS's), Compilers, Report Writers, Operating System, etc.
<b>Application</b>	Commercial packages and custom-developed application systems which provide end-user functionality.
<b>Maintenance (Hardware)</b>	Maintenance costs on all of the above.
<b>Internal Direct Support</b>	Staff costs directly associated with developing, maintaining and operating the above items.
<b>Support Service Contractors</b>	Supplemental staff beyond those listed for in-house staff shown above.
<b>Network</b>	Includes owned/leased equipment, Public Switched Network, Wide Area Networks (WAN's) and other network services.
<b>Internal FTE Headcount</b>	Internal FTE headcount.
<b>Support Service Contractors (FTE headcount)</b>	FTE headcount for supplemental staff beyond internal staff identified above.
<b>Other</b>	Any other items not listed above.

Sources, Assumptions and Constraints:

1. Figures are FY98 budget numbers provided by ED apart from CDS, LOS, LCS, LSS which are FY98 actuals. FY98 headcount figures for Internal or Government FTE's came from ED.
2. Figures for each system were apportioned to the TAFIM cost categories above through a two step process:
  - 2.1. Cost figures for each system were assigned to FIPSPUB 64 cost categories using the same proportions documented in the *Project EASI/ED CBA*, Appendix H.
  - 2.2. FIPSPUB 64 cost categories were mapped to the TAFIM cost categories as follows:
    - **Hardware:** Non-Recurring Capital Equipment cost summary line.
    - **Software:** Non-Recurring Capital Software Line
    - **Applications:** Recurring costs Software line
    - **Maintenance (Hardware):** Recurring costs Hardware line
    - **Internal Direct Support:** Recurring Costs Personnel Line plus Travel & Training
    - **Support Service Contractors (Cost):** Recurring Costs Support Services Line
    - **Network:** Recurring Cost Data Communications line
    - **Internal FTE Headcount:** CBA Current System Cost descriptions, Appendix H
    - **Support Service Contractors:** (FTE Headcount) Data gathered for the Discussion Draft *Project EASI/ED Acquisition Strategy* (November 1997).
3. CDS and LSS contractor headcount were available combined in one contract. The headcounts for each system were split as follows: 70 CDS, 661 LSS, which includes 450

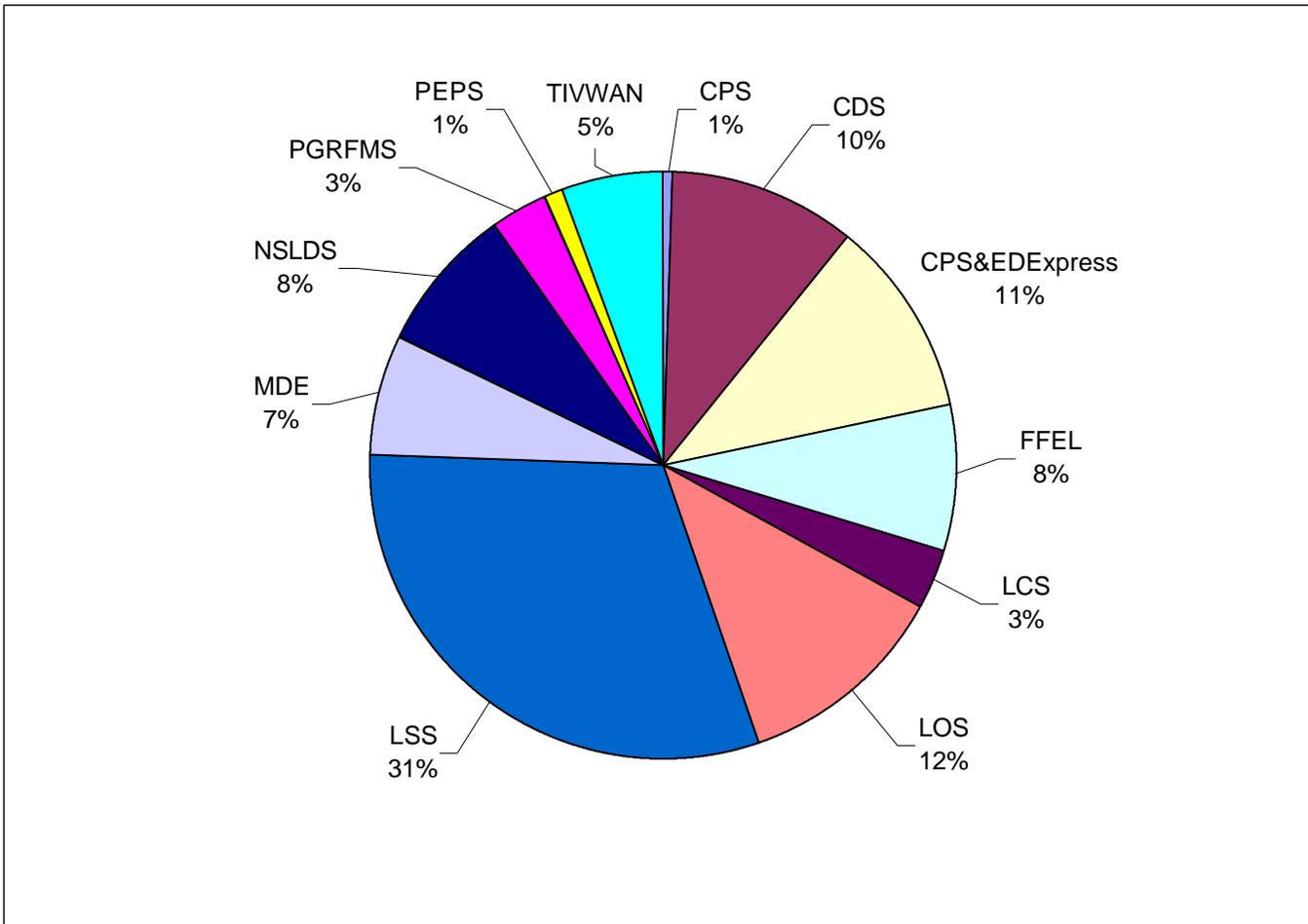
customer service personnel. The non customer service differential is based on *Project EASI/ED CBA* budget proportions for CDS and LSS

Figure 4-1 shows the cost distribution of each application system as a percent of the total SFAP Title IV systems budget.

Systems Cost Categories	Campus-Based System	Central Database System	Central Processing System	Federal Family Education Loan Program	Loan Consolidation System	Loan Origination System	Loan Servicing System	Multiple Data Entry	National Student Loan Data System	Pell Grant Recipient and Financial Mgmt Sys	Postsecondary Education Participants System	Title IV Wide Area Network
(\$ In Thousands)												
Hardware	\$202		\$170							\$94		\$35
Software	\$125		\$9,240	\$6,729				\$168	\$1,868	\$915		\$4,269
Applications	\$861	\$15,810		\$765		\$7,268	\$5,362		\$1,005	\$1,551	\$126	\$2,538
Maintenance (Hardware)	\$114		\$5						\$1,896		\$96	
Internal Direct Support	\$829	\$1,418	\$2,679	\$1,029	\$305	\$621	\$2,734	\$343	\$718	\$1,653	\$2,436	\$271
Support Service Contractors (Cost)	\$50	\$14,770	\$20,254	\$16,839	\$10,694	\$29,110	\$89,902	\$20,711	\$20,507	\$5,690	\$871	\$5,207
Network			\$891						\$60			\$4,412
Other	\$30		\$1,621	\$110				\$65				\$665
<b>Total Costs</b>	<b>\$2,211</b>	<b>\$32,000</b>	<b>\$34,860</b>	<b>\$25,472</b>	<b>\$11,000</b>	<b>\$37,000</b>	<b>\$98,000</b>	<b>\$21,287</b>	<b>\$26,054</b>	<b>\$9,903</b>	<b>\$3,529</b>	<b>\$17,397</b>
Internal FTE Headcount	10	12	22	25	3	12	19	4	16	12	13	5
Support Service Contractors (FTE Headcount <sup>1</sup> )	25	70		283	90	117	661		70		45	

**Table 4-3. Current Systems Itemized Cost**

<sup>1</sup> CDS & LSS contractor headcounts combined in one contract. Separated as follows: 129 CDS, 661 LSS, which includes 450 LSS customer service personnel.



**Figure 4-1. Application Cost Distribution**

## 4.2 Application to Function Cross-Reference

Table 4-4 shows the business functions that each current SFAP system supports. Any individual current system implements a given function if the corresponding matrix element contains an “X”.

Functions	FISAP Processing	Award Processing	Waiver Tracking	Application Processing & Management	School and State Payment Processing & Management	Debt Management & Collections	Lenders and Guaranty Agency Payment Processing	Consolidation Processing	Loan Origination Management	Loan Servicing	Customer Service	Borrower Repayment Processing	Student Status Confirmation Reporting	School, GA, Lender and Servicer Default Information Support	School Eligibility Data management	Guaranty Agency, Lender, Servicer Eligibility Data Support	System Billing and Invoice Management	Accounting and Financial Management	Program Monitoring	
Application																				
Campus-Based System	X	X	X		X	X					X			X	X			X	X	
Central Processing System				X							X				X					X
Central Database System																		X	X	
EDEXpress				X					X											X
Loan Consolidation System								X	X		X							X	X	
Loan Origination System		X			X				X		X							X	X	
Loan Servicing System						X		X		X	X	X						X	X	
Federal Family Education Loan Program						X	X			X	X	X						X	X	
Multiple Data Entry				X																
National Student Loan Data System				X									X	X	X	X				X

**Table 4-4. Application to Business Function Cross Reference**

<b>Functions</b>	FISAP Processing	Award Processing	Waiver Tracking	Application Processing & Management	School and State Payment Processing & Management	Debt Management & Collections	Lenders and Guaranty Agency Payment Processing	Consolidation Processing	Loan Origination Management	Loan Servicing	Customer Service	Borrower Repayment Processing	Student Status Confirmation Reporting	School, GA, Lender and Servicer Default Information Support	School Eligibility Data management	Guaranty Agency, Lender, Servicer Eligibility Data Support	System Billing and Invoice Management	Accounting and Financial Management	Program Monitoring
<b>Application</b>																			
Pell Grant Recipient and Financial Management		X			X						X							X	X
Postsecondary Education Participants System														X	X	X			X
Title IV Wide Area Network										X					X		X		
Procedure Application Report Tracking						X													X
Perkins Loan Institutional Status Tracking					X														X
Return Log System	X													X					X
Default Reduction Assistance Program System						X													X
Low-income School Directory System																			X
State Student Incentive Grant		X			X													X	X

**Table 4-4. Application to Business Function Cross Reference (cont'd.)**

### 4.3 Comparison with Architecture Principles

This subsection compares the TAFIM current Title IV systems application view with architecture principles defined in the *SFAP Enterprise Information Technology Framework: Business Drivers and Architecture Principles* document. Each principle is listed along with associated comments highlighting areas where current systems do not fully support the principle.

**Principle 6. No Vendor Bias:** Standards and technology choices will be based on vendor-neutral standards where they are available and realistically can be implemented. Products will be chosen from any vendor with strong business stability, who provides the best technology and service for a business need and whose products are compliant with its architecture standards.

**Comments:**

SAP systems comprise products from many vendors whose products are not mutually compatible. Therefore, technology choices for current systems often cannot be vendor-neutral. Few of the products need to develop and maintain SFAP systems could be considered commodity purchases.

**Systems Affected:**

CBS, CDS, CPS, FFEL, LCS, LOS, LSS, MDE, NSLDS, PEPS, PGRFMS

**Principle 9. Reduce Integration Complexity:** Products, tools, designs, applications, and methods will be selected to reduce integration and infrastructure complexity.

**Comments:**

Current SFAP systems operate on diverse hardware platforms, use a wide range of system and application software, and do not adhere to a common technical architecture. The use of different platforms, software and architecture increases integration and infrastructure complexity. This diversity contributes to system interoperability issues, affects the ability of systems to accommodate new system requirements, and affects the system's ability to benefit from advances in technology that help simplify systems integration.

**Systems Affected:**

CBS, CDS, CPS, EDEExpress, FFEL, LCS, LOS, LSS, MDE, NSLDS, PEPS, PGRFMS, TIVWAN

**Principle 15. Business Logic:** Where appropriate and cost effective, business logic will be separate from data access logic in SFAP's future information systems.

**Comments:**

The LCS and LOS systems have architectures that address this principle. None of the other SFAP systems adhere to this principle.

**Systems Affected:**

CBS, CDS, CPS, EDEExpress, FFEL, LSS, MDE, NSLDS, PEPS, PGRFMS, TIVWAN

**Principle 20. Object-Oriented Design and Structure:** Where practical, applications shall be designed using objects, which encapsulate data structures and present a functional interface to application logic.

**Comments:**

None of the current systems use the object-oriented paradigm to implement major system functionality. There are a few instances where applications such as PowerSoft's PowerBuilder and C++ are used for application development but these applications represent a small percentage of the total number of SFAP applications.

**Systems Affected:**

CBS, CDS, CPS, FFEL, LSS, MDE, NSLDS, PEPS, PGRFMS, TIVWAN

**Principle 21. Event Driven Processing:** Where practical, application design shall be event driven, employing a real-time processing methodology versus batch processing.

**Comments:**

PEPS is the only SFAP program system that operates primarily in an event driven environment. All other systems primarily run in batch mode.

**Systems Affected:**

CBS, CDS, CPS, FFEL, LCS, LOS, LSS, MDE, NSLDS, PGRFMS, TIVWAN

**Principle 22. Use of Automated Development and Testing Tools:** Standardized information systems tools will be used across SFAP for business modeling, systems design, development, and configuration management. Application development and testing will maximize their reliance on automated tools.

**Comments:**

Sterling Software's COOL suite of products has been selected as a standard for application development within SFAP. Several SFAP systems (CDS, LOS, LCS, NSLDS) have been developed using Composer by IEF, and are therefore compatible with the COOL products. In addition, PEPS has been developed using the Designer 2000 CASE tool. However, none of the systems employ automated testing capability and each system has its own Configuration Management (CM) processes & tools.

**Systems Affected:**

CBS, CDS, CPS, EDEXpress, FFEL, LOS, LCS, LSS, MDE, PEPS, PGRFMS, TIVWAN

## 5. TECHNOLOGY VIEW

This section presents an inventory of the technology platforms used by the current SFAP systems and lists the standards followed by the systems.

Subsection 5.1 lists the hardware, software and communication components of the Title IV systems. It also documents the major standards and architecture services the components support. Subsection 5.2 compares the SFAP architecture principles to the information listed in the technology view.

### 5.1 Current Hardware, Software, and Communication Components

This subsection lists the hardware, software and communications components of the SFAP systems. Subsection 5.1.1 lists the technology platforms used in each system. Subsection 5.1.2 lists the application platform software utilized in each system.

#### 5.1.1 Technology Inventory

Table 5-1 lists the equipment type, vendor name and quantity at each location for the generic technology platform types listed in the left most column of the table. The generic technology platform definitions of are as follows:

- **Workstation** - Any terminal device which is not a PC or an Intelligent Workstation.
- **Output/input Peripheral** - Platforms such as Laser Printer, Line Printers, Scanner, Card Reader, etc..
- **Local Area Network (LAN)** - The hardware aspects of Local Area Networks such as Token Ring, Ethernet, LocalTalk, etc.
- **LAN Server**- A platform which is used to run the LAN operating system and services. This could be a PC or a specialized server platform of any size.
- **Wide Area Network (WAN)** - Device that provides long haul communications services, such as DISN, DDN, Telnet, Tymnet, etc.
- **Network Interface Devices** - A device that provides an interface between the network and the computer processor, such as Front-end processors like IBM 3705 and NCR Comten.
- **Concentrator, Multiplexer, Switching Device** - Devices such as routers, gateways, cluster controllers, etc. which allow the basic network resources to be effectively used for multiple purposes.
- **Transmission Devices** - Specialized devices which provide the transmission medium for information transfer, beyond the facilities identified earlier in the WAN category, such as VHF, and SHF Radio and/or Satellite.
- **Storage Devices** - Devices which allow the storage and retrieval of information, such as Disk Drives, Tape Drives, Microfilm Processors, etc.
- **Mid-Range Processors** - Processors which are larger than workstations or terminal devices both physically and in processing and peripheral controlling capability, but not the large, mainframe class (AS400, 4381, HP9000).

- **Large Processors** - The largest mainframe processing platforms such as IBM 3090 Model 400E and Hitachi's 5890-600E. This would include large massively parallel processors and/o vector bad supercomputers.
- **Image Processors** - Devices that are specifically devoted to the processing of digital images, such as Kodak's Komstar system.

Sources:

- *Project EASI/ED Technical Vision and Target Architecture (TVTA) Report, Section 3 Current System.*
- Current SFAP system overview / Detail design documents.
- Current system baseline questionnaires.

Technology Platform	Platform Names	Vendor Name	Platform Model	Platform Owner	Quantities by Physical Location		
Note: N/A = Not Applicable, N/P = No Information Provided							
<b>CBS</b>					Beltsville, MD		
Workstation	PC's	N/P	N/P	Lockheed Martin			
Output/Input Peripherals	Laser Printers	HP	8000 DN	ED	2		
Local Area Network	TCP/IP	Microsoft	LANMAN.DOS	Lockheed Martin			
Wide Area Network	N/P	N/P	N/P	N/P			
Network Interface	N/P	N/P	N/P	N/P			
Concentrator/Multiplexer Switching	Cisco Router	CISCO	2501	ED	2		
Transmission Device	N/P	N/P	N/P				
Storage Device	Disk Packs	N/P	3380	Lockheed Martin	2		
Mid Range Processor	N/P	N/P	N/P				
Large Processor	Mainframe	IBM	5995	Lockheed Martin	1		
Image Processor	N/A	N/A	N/A	N/A	N/A		

<b>CDS</b>					Rockville, MD		
Workstation	PC's	Microsoft	NT	N/P	N/P		
	PC's	Microsoft	Windows-95	N/P	N/P		
Output/Input Peripherals	Printer	IBM	FEP 3174	N/P	N/P		
Local Area Network	Token Ring	Microsoft, VTAM	N/P	CDSI	N/P		
Wide Area Network	N/P	N/P	N/P	N/P	N/P		
Network Interface	N/P	N/P	N/P	N/P	N/P		
Concentrator/Multiplexer Switching	Router	CISCO	7010	N/P	N/P		
Transmission Device	N/P	N/P	N/P	N/P	N/P		
Storage Device	RAID DASD	IBM	3390	N/P	N/P		
Mid Range Processor	Mainframe	IBM	CMOS	CDSI	N/P		
Large Processor	N/P	N/P	N/P	N/P	N/P		
Image Processor	N/P	N/P	N/P	N/P	N/P		

**Table 5-1. Technology Platform Inventory**

Technology Platform	Platform Names	Vendor Name	Platform Model	Platform Owner	Quantities by Physical Location		
Note: N/A = Not Applicable, N/P = No Information Provided							
<b>CPS</b>					Iowa City, IA		
Workstation	N/P	N/P	N/P	N/P			
Output/Input Peripherals	Laser Printer	IBM	3800	National Computer Systems	13		
	Laser Printer	IBM	3900	National Computer Systems	2		
	Laser Printer	IBM	4248	National Computer Systems	1		
	Laser Printer	Xerox	4850	National Computer Systems	1		
	Laser Printer	Xerox	4890	National Computer Systems	1		
	Laser Printer	Xerox	4135	National Computer Systems	1		
	Laser Printer	Xerox	3700	National Computer Systems	3		
Local Area Network	TCP/IP, SNA	N/P	N/P	National Computer Systems	N/P		
Wide Area Network	VAN	N/P	N/P	N/P	N/P		
Network Interface	N/P	N/P	N/P	N/P			
Concentrator/Multipler Switching	N/P	N/P	N/P	N/P			
Transmission Device	Communication Control Unit	IBM	3275	National Computer Systems	1		
	Terminal Control Unit	IBM	3274	National Computer Systems	1		
	Terminal Control Unit	IBM	3174	National Computer Systems	3		
	Interconnect Control Unit	IBM	3172	National Computer Systems	1		
	Multiprotocol Router	CISCO	7000	National Computer Systems	1		
	Router	CISCO	2502	National Computer Systems	3		
	Router	CISCO	2501	National Computer Systems	3		

**Table 5-1. Technology Platform Inventory (cont'd.)**

Technology Platform	Platform Names	Vendor Name	Platform Model	Platform Owner	Quantities by Physical Location		
Note: N/A = Not Applicable, N/P = No Information Provided							
<b>CPS (Cont.)</b>					Iowa City, IA		
	CSU/DSU	ASC	Kentrox	National Computer Systems	10		
	Multiple Communication Protocol	NSC	DXE	National Computer Systems	1		
Storage Device	DASD	IBM	3990	National Computer Systems	2		
	DASD	HDS	7690	National Computer Systems	1		
	DASD	HDS	7693	National Computer Systems	1		
	DASD	HDS	7890	National Computer Systems	1		
	DASD	HDS	7390	National Computer Systems	1		
	Tape	IBM	3803	National Computer Systems	1		
	Tape	IBM	3420	National Computer Systems	1		
	Tape	IBM	3480	National Computer Systems	2		
	Optical	IBM	3995	National Computer Systems	6		
Mid Range Processor							
Large Processor	Mainframe	IBM	9672-R63	National Computer Systems	1		
Image Processor	Scanner	Opscan	2010 (W201)	National Computer Systems	26		
	Scanner	Opscan	9101 (HPS)	National Computer Systems	11		

**Table 5-1. Technology Platform Inventory (cont'd.)**

Technology Platform	Platform Names	Vendor Name	Platform Model	Platform Owner	Quantities by Physical Location		
Note: N/A = Not Applicable, N/P = No Information Provided							
<b>FFELP</b>					Greenville, TX		
Workstation	Terminals	IBM	3174	N/P	N/P		
Output/Input Peripherals	Laser	IBM	3827	N/P	N/P		
Local Area Network	Ethernet	Microsoft, IBM	N/P	N/P	N/P		
Wide Area Network	N/P	N/P	N/P	N/P	N/P		
Network Interface	N/P	N/P	N/P	N/P	N/P		
Concentrator/Multipler Switching	N/P	N/P	N/P	N/P	N/P		
Transmission Device	N/P	IBM	3745	N/P	N/P		
	N/P	AT&T	PARADYNE DSUs	N/P	N/P		
Storage Device	DASD	IBM	33XX equivalent	N/P	N/P		
	Tape	IBM	34XX	N/P	N/P		
Mid Range Processor				N/P	N/P		
Large Processor	Mainframe	IBM	9672/R52	N/P	1		
Image Processor	Mainframe	SUN	SPARC 1000E	N/P	1		

LCS					Plano, TX	Ballston, VA	Montgomery, AL
Workstation	PC		486	ED	N/P	N/P	N/P
Output/Input Peripherals	LaserJet	HP	4Si	ED	N/P	N/P	N/P
	Printers	Data Products	Typhoon	ED	N/P	N/P	N/P
Local Area Network	Ethernet	Novell	NetWare	ED	N/P	N/P	N/P
Wide Area Network	FTS 2000	N/P	N/P	ED	N/P	N/P	N/P
Network Interface	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Concentrator/Multipler Switching	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Transmission Device	Phone PBX	AT&T	Definity G3iV3	ED	N/P	N/P	N/P
Storage Device	DASD	N/P	N/P	ED	N/P	N/P	N/P
	DAT Tape	N/P	N/P	ED	N/P	N/P	N/P
	Optical Juke Box	HP	200T-4-4	ED	N/P	N/P	N/P
Mid Range Processor	Midrange; Production Server	HP	9000 T500	ED	N/P	N/P	N/P

**Table 5-1. Technology Platform Inventory (cont'd.)**

Technology Platform	Platform Names	Vendor Name	Platform Model	Platform Owner	Quantities by Physical Location		
Note: N/A = Not Applicable, N/P = No Information Provided							
<b>LCS (Cont.)</b>					Plano, TX	Ballston, VA	Montgomery, AL
	Midrange; Backup Server	HP	9001 T500	ED	N/P	N/P	N/P
Large Processor	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Image Processor	Scanner	Fujitsu	3099	ED	N/P	N/P	N/P
<b>LOS</b>					Plano, TX	Ballston, VA	Montgomery, AL
Workstation	PC	N/P	486	ED	N/P	N/P	N/P
Output/Input Peripherals	LaserJet	HP	4Si	ED	N/P	N/P	N/P
	Printers	Data Products	Typhoon	ED	N/P	N/P	N/P
Local Area Network	Ethernet	Novell	NetWare	ED	N/P	N/P	N/P
Wide Area Network	FTS 2000	N/P	N/P	ED	N/P	N/P	N/P
Network Interface	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Concentrator/Multiplexer Switching	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Transmission Device	Phone PBX	AT&T	Definity G3iV3	ED	N/P	N/P	N/P
Storage Device	DASD	N/P	N/P	ED	N/P	N/P	N/P
	DAT Tape	N/P	N/P	ED	N/P	N/P	N/P
	Optical Juke Box	HP	200T-4-4	ED	N/P	N/P	N/P
Mid Range Processor	Midrange; Production Server	HP	9000 T600	ED	N/P	N/P	N/P
	Midrange; Backup Server	HP	9001 T600	ED	N/P	N/P	N/P
Large Processor	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Image Processor	Scanner	Fujitsu	3099	ED	N/P	N/P	N/P

**Table 5-1. Technology Platform Inventory (cont'd.)**

Technology Platform	Platform Names	Vendor Name	Platform Model	Platform Owner	Quantities by Physical Location		
Note: N/A = Not Applicable, N/P = No Information Provided							
<b>LSS</b>					Rockville, MD	Utica, NY	Bakersfield, CA
Workstation	DEC Stations	Digital	DECpc LPv 433s	CDSI	N/P	N/P	N/P
	Console	Digital	VAX 4000	CDSI	N/P	N/P	N/P
	Terminals	IBM	3270	CDSI	N/P	N/P	N/P
	Terminals	IBM	VTXX	CDSI	N/P	N/P	N/P
Output/Input Peripherals	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Local Area Network	Ethernet	Novell, Microsoft	Netware, NT	CDSI	N/P	N/P	N/P
Wide Area Network	T1	N/P	N/P	CDSI	N/P	N/P	N/P
Network Interface	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Concentrator/Multiplexer Switching	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Transmission Device	Routers	Digital	DEC routers	CDSI	N/P	N/P	N/P
Storage Device	DASD	IBM	3390	CDSI	N/P	N/P	N/P
	Tape	IBM	3480	CDSI	N/P	N/P	N/P
	Tape	IBM	6250	CDSI	N/P	N/P	N/P
Mid Range Processor	Midrange	Digital	VAX 7000/630	CDSI	N/P	N/P	2
	Midrange	Digital	DEC-Alpha - 2000	CDSI	1	N/P	N/P
	Midrange	Digital	VAX 7610	CDSI	N/P	N/P	1
Large Processor	Mainframe	IBM	CMOS	CDSI	N/P	N/P	1
Image Processor	Server	FileNET	6580	CDSI	N/P	1	N/P

<b>MDE</b>					Iowa City, IA	Mt. Vernon, IL	Lawrence, KS
Workstation	PC	SWAN	486DX2/Pentiums	N/P	N/P	5	N/P
	PC	HP	5//75 & 5/100	N/P	54	N/P	N/P
	PC	Compaq	Pentium II - 300	N/P	N/P	100	N/P
	PC	Micron	N/P	N/P		35	N/P
Output/Input Peripherals	Pocket Print Server	Xionics	N/P	N/P	N/P	N/P	N/P
	LaserJet	HP	LaserJet 5Si	N/P	1		N/P
	LaserJet	HP	LaserJet 4	N/P	N/P	4	N/P
	Printer	IBM	4224	N/P	1	N/P	N/P
Local Area Network	10BaseT	Novell	NetWare	N/P	N/P	N/P	N/P
	10BaseT	Microsoft	NT	N/P	N/P	N/P	N/P

**Table 5-1. Technology Platform Inventory (cont'd.)**

Technology Platform	Platform Names	Vendor Name	Platform Model	Platform Owner	Quantities by Physical Location		
Note: N/A = Not Applicable, N/P = No Information Provided							
<b>MDE (Cont.)</b>					Iowa City, IA	Mt. Vernon, IL	Lawrence, KS
	NetServers	HP	5/133 LS	N/P	3	N/P	N/P
	Server	Micron	FIP, AEG, DV	N/P	N/P	41	
Wide Area Network	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Network Interface	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Concentrator/Multi-plexer Switching	Concentrator	3Com	FDDI	N/P	2	N/P	N/P
	Concentrator	N/P	10BaseT	N/P	N/P	N/P	N/P
	DSU/CSU	Kentrox	78561	N/P	2	N/P	N/P
	Concentrator	3Com	1407364-1859051	N/P	N/P	N/P	N/P
Transmission Device	Routers	CISCO	7000	N/P	N/P	1	N/P
	Routers	CISCO	2514	N/P	2	N/P	N/P
	Routers	CISCO	7002	N/P	N/P	N/P	N/P
	Routers	CISCO	4500	N/P	N/P	1	
	CSU/DSU	Transport	T3000	N/P	N/P	N/P	N/P
Storage Device	RAID	SUN	RSD-100-2	N/P	N/P	N/P	N/P
	DAT	HP	Jetstore 2000E	N/P	N/P	N/P	N/P
	TAPE	Exabyte	210	N/P	N/P	1	N/P
	DASD	IBM	3380	N/P	N/P	N/P	N/P
Mid Range Processor	Server	SUN	SPARC20	N/P	N/P	N/P	N/P
Large Processor	Mainframe	IBM	3090 300 S	N/P	1	N/P	N/P
Image Processor	Server	SUN	SPARC20	N/P	N/P	N/P	N/P
	Scanner	Kodak	990	N/P	N/P	N/P	N/P
	Scanner	Kodak	990DX	N/P	N/P	N/P	N/P
	OCR	Siemens Nixdorf	38-39;85-87;580	N/P	N/P	1	N/P

**Table 5-1. Technology Platform Inventory (cont'd.)**

Technology Platform	Platform Names	Vendor Name	Platform Model	Platform Owner	Quantities by Physical Location		
Note: N/A = Not Applicable, N/P = No Information Provided							
<b>NSLDS</b>					Meridan, CT	Iowa City	
Workstation	Terminals	IBM	3745	CSC	1	N/P	N/P
Output/Input Peripherals	N/P	N/P	N/P	NCS		X	
Local Area Network	Token Ring	N/P	N/P	CSC	N/P	N/P	N/P
Wide Area Network	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Network Interface	Controller	IBM	3172	CSC	N/P	N/P	N/P
Concentrator/Multi-plexer Switching	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Transmission Device	Communication Control Unit	IBM	3275	CSC	1	N/P	N/P
	Terminal Control Unit	IBM	3274	CSC	1	N/P	N/P
	Interconnect Control Unit	IBM	3172	CSC	1	N/P	N/P
	MultiProtocol Router	CISCO	7000	CSC	N/P	N/P	N/P
	Routers	CISCO	2502	CSC	N/P	N/P	N/P
Storage Device	RAID-5 DASD	Amdhal	SP200 Spectris	CSC	N/P	N/P	N/P
	Tape	Memorex	3420	CSC	2	N/P	N/P
	Tape Controller	IBM	3490-A20	CSC	2	N/P	N/P
	Tape Unit	IBM	3490-A20	CSC	16	N/P	N/P
	Tape Carousel	STK	4551	CSC	1	N/P	N/P
Mid Range Processor	Mid-Range	IBM	3174	CSC	4	N/P	N/P
Large Processor	Mainframe	Hitachi	9672, R35	CSC	1	N/P	N/P
	Channel to Channel Conn.	Amdhal	3088	CSC	1	N/P	N/P
Image Processor	N/P	N/P	N/P	N/P	N/P	N/P	N/P

**Table 5-1. Technology Platform Inventory (cont'd.)**

Technology Platform	Platform Names	Vendor Name	Platform Model	Platform Owner	Quantities by Physical Location		
Note: N/A = Not Applicable, N/P = No Information Provided							
<b>PGRFMS</b>					Calverton, MD	Rockville, MD	ROB 3
Workstation	PC	N/P	Pentium PC	ED	N/P	N/P	9
	PC	Zenith	386SX	ED	N/P	N/P	N/P
	PC	N/P	486	N/P	N/P	N/P	N/P
Output/Input Peripherals	Line/Laser Printer	IBM	4245-20	Lockheed Martin	N/P	N/P	N/P
	N/P	IBM	4248	Lockheed Martin	N/P	N/P	N/P
	N/P	Genicom	4440XT	ED	N/P	N/P	N/P
	N/P	Harris	LB615	ED	N/P	N/P	N/P
	N/P	Toshiba	P351	ED	N/P	N/P	N/P
	Office Jet	HP	570	Lockheed Martin	N/P	N/P	N/P
	Laser Jet	HP	V	ED	N/P	N/P	N/P
	Microfiche	InfoGraphic	100AT	Lockheed Martin	N/P	N/P	N/P
	Laser Printer	Xerox	9790	Lockheed Martin	N/P	N/P	N/P
Local Area Network	Ethernet	Novell	NetWare	N/P	N/P	N/P	N/P
Wide Area Network	Telnet	N/P	N/P	N/P	N/P	N/P	N/P
Network Interface	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Concentrator/Multipler Switching	N/P	IBM	3172	Lockheed Martin	1	N/P	N/P
	N/P	IBM	3274	Lockheed Martin	3	N/P	N/P
Transmission Device	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Storage Device	Disk	N/P	STK 9200	Lockheed Martin	1	N/P	N/P
	Disk	N/P	STK 9201	Lockheed Martin	1	N/P	N/P
	DASD	IBM	3990-3	Lockheed Martin	1	N/P	N/P
	DASD	IBM	3990-A28	Lockheed Martin	N/P	N/P	N/P
	DASD	IBM	3990-V2C	Lockheed Martin	N/P	N/P	N/P
	Tape	IBM	3480-A22	Lockheed Martin	20	N/P	N/P
	Tape		STK 3670	Lockheed Martin	10	N/P	N/P
Mid Range Processor	Midrange	SUN	SPARC20	ED	N/P	N/P	N/P
Large Processor	Mainframe	Amdahl	5995-1100A	Lockheed Martin	N/P	N/P	N/P
Image Processor	N/P	N/P	N/P	N/P	N/P	N/P	N/P

**Table 5-1. Technology Platform Inventory (cont'd.)**

Technology Platform	Platform Names	Vendor Name	Platform Model	Platform Owner	Quantities by Physical Location		
Note: N/A = Not Applicable, N/P = No Information Provided							
<b>PEPS</b>					Meridan, CT		
Workstation	PC	N/P	80486	N/P	N/P		
Output/Input Peripherals	N/P	N/P	N/P	N/P	N/P		
Local Area Network	TCP/IP	HP	N/P	N/P	N/P		
	Ethernet, FDDS	Novell	NetWare	N/P	N/P		
Wide Area Network	N/P	N/P	N/P	N/P	N/P		
Network Interface	N/P	N/P	N/P	N/P	N/P		
Concentrator/Multiplexer Switching	N/P	N/P	N/P	N/P	N/P		
Transmission Device	Router	N/P	FDDI	N/P	N/P		
Storage Device	CD-ROM	N/P	N/P	N/P	N/P		
	Tape	N/P	4mm DAT	N/P	N/P		
	RAID	N/P	N/P	N/P	N/P		
	DASD	N/P	N/P	N/P	N/P		
Mid Range Processor	Midrange	HP	9000 T500	N/P	N/P		
Large Processor	N/P	N/P	N/P	N/P	N/P		
Image Processor	N/P	N/P	N/P	N/P	N/P		

TIVWAN					GEIS	Iowa City, AI	Ballston, VA
Workstation	Terminals	IBM	3270	NCS	N/P	N/P	N/P
	Workstations			NCS	N/P	N/P	N/P
	Terminals	IBM	VT100	NCS	N/P	N/P	N/P
Output/Input Peripherals	Printer	IBM	4890	NCS	N/P	N/P	1
	Printer	IBM	4850	NCS	N/P	N/P	1
	Impact Printer	IBM	4248	NCS	N/P	N/P	1
	Laser Printer	IBM	4135	NCS	N/P	N/P	9
	Laser Printer	IBM	3800	NCS	N/P	N/P	5
	Laser Printer	STC	6100	NCS	N/P	N/P	1
	Laser Printer	Xerox	9700	NCS	N/P	N/P	1
	Laser Printer	Xerox	9790	NCS	N/P	N/P	1

**Table 5-1. Technology Platform Inventory (cont'd.)**

Technology Platform	Platform Names	Vendor Name	Platform Model	Platform Owner	Quantities by Physical Location		
Note: N/A = Not Applicable, N/P = No Information Provided							
<b>TIVWAN (Cont.)</b>					GEIS	Iowa City, IA	Ballston, VA
	Laser Printer	Xerox	4050	NCS	N/P	N/P	1
		IBM	3275	NCS	N/P	1	N/P
Local Area Network	Token Ring	IBM	N/P	N/P	N/P	N/P	N/P
Wide Area Network	GE Information Services (GEIS)	IBM	3725/26	GE	1	N/P	N/P
	GEIS	IBM	SNA	GE	N/P	N/P	N/P
	GEIS	IBM	SNI	GE	N/P	N/P	N/P
	GEIS	IBM	SDLC	GE	N/P	N/P	N/P
Network Interface	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Concentrator/Multiplexer/Switching	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Transmission Device	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Storage Device	DASD	IBM	3990	NCS	N/P	14	N/P
	DASD	IBM	3880	NCS	N/P	5	N/P
	DASD	IBM	7690	NCS	N/P	3	N/P
	TAPE	IBM	3480	NCS	N/P	15	N/P
	TAPE	IBM	3420	NCS	N/P	6	N/P
	TAPE	IBM	3803	NCS	N/P	1	N/P
Mid Range Processor	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Large Processor	Mainframe	IBM	9672-R44 / OS390	NCS	N/P	1	N/P
Image Processor	N/P	N/P	N/P	N/P	N/P	N/P	N/P

**Table 5-1. Technology Platform Inventory (cont'd.)**

### 5.1.2 Standards to Platform Cross-Reference

Table 5-2 lists the specific types of standard products in use by each of the current SFAP systems. The services for which standards are defined as follows:

<b>User Interface</b>	The service which controls the presentation of the results of computer system processing to the user (i.e. Windows, 3270, Character-based).
<b>Operating System</b>	The service which controls the basic operation of the computing platform (i.e. MS-DOS, MVS-XA, DOS/VSE, OS/400, UNIX.)
<b>Communications Management</b>	The service which controls the connectivity of this platform to others (i.e. Novell NetWare, SNA, TCP/IP, etc.)
<b>Database Management</b>	The service which controls how the data is managed on the platform (dBase, Oracle, DB2, Paradox, etc.)
<b>Transaction Monitor</b>	The service which controls the processing of online transactions (i.e. CICS, IMS-DC, TSO, CMS, etc.)
<b>Document Management</b>	The service which controls document creation, storage, and retrieval for the platform (i.e. DISOSS, MS-Word, Word Perfect, Office Vision, etc.)

Where within Table 5-2 *N/A* = Not Applicable and *N/P* = No Information Provided

CBS Service	Platform Names		
	PCs	Network Servers (LAN)	IBM 5995 Mainframe
User Interface	Windows Applications	<i>N/P</i>	<i>N/P</i>
Operating System	Windows/DOS	<i>N/P</i>	MVS/ESA
Communication Management	<i>N/P</i>	TCP/IP	<i>N/P</i>
Database (and/or file) Management	<i>N/P</i>	<i>N/A</i>	VSAM, ISAM
Transaction Monitor	<i>N/A</i>	<i>N/A</i>	<i>N/P</i>
Document Management	<i>N/P</i>	<i>N/P</i>	<i>N/P</i>

**Table 5-2: Current System Platform Standards**

<b>CDS</b>	<b>Platform Names</b>		
	<b>Standard</b>	PCs	Network Servers (LAN)
User Interface	GUI	N/P	N/P
Operating System	Windows/DOS	N/P	MVS,ESA
Communication Management	N/P	Ethernet & TCP/IP, SDLC	N/P
Database (and/or file) Management	N/P	N/A	DB2
Transaction Monitor	N/A	N/A	N/P
Document Management	N/P	N/P	N/P

<b>CPS</b>	<b>Platform Names</b>		
	<b>Standard</b>	PCs	Network Servers (LAN)
User Interface	N/P	N/P	TN3270
Operating System	Windows	N/P	OS/390
Communication Management	N/P	Ethernet, Token Ring, TCP/IP, SNA	IBM Communication Control Unit, CISCO Router
Database (and/or file) Management	N/P	N/A	DB2
Transaction Monitor	N/A	N/A	N/P
Document Management	N/P	N/P	N/P

<b>FFELP</b>	<b>Platform Names</b>		
	<b>Standard</b>	Terminals	Network Servers (LAN)
User Interface	N/P	EDLAN 56KBs	TN3270
Operating System	Windows-95	NT, MVS	OS390
Communication Management	TCP/IP	Ethernet	TCP/IP, SNA
Database (and/or file) Management	N/P	N/A	IDMS, Informix
Transaction Monitor	CICS	N/A	TSO
Document Management	MS-Word	N/P	N/P

**Table 5-2: Current System Platform Standards (cont'd.)**

<b>LCS</b>	<b>Platform Names</b>		
<b>Standard</b>	PCs	Network Servers (LAN)	HP-9000 T500 Mid-Size
User Interface	Windows Applications	<i>N/P</i>	<i>N/P</i>
Operating System	Windows/DOS	Ethernet w/ Netware	HP-UX 10 20
Communication Management	<i>N/P</i>	TCP/IP, IPX/SPC	<i>N/P</i>
Database (and/or file) Management	MS-Access	<i>N/P</i>	Informix
Transaction Monitor	<i>N/A</i>	<i>N/A</i>	<i>N/P</i>
Document Management	<i>N/P</i>	<i>N/P</i>	<i>N/P</i>

<b>LOS</b>	<b>Platform Names</b>		
<b>Standard</b>	PCs	Network Servers (LAN)	HP-9000 T500 Mid-Size
User Interface	Windows Applications	<i>N/P</i>	<i>N/P</i>
Operating System	Windows/DOS	Ethernet w/ Netware	HP-UX 10 20
Communication Management	<i>N/P</i>	TCP/IP, IPX/SPX	<i>N/P</i>
Database (and/or file) Management	MS-Access	<i>N/A</i>	Informix
Transaction Monitor	<i>N/P</i>	<i>N/P</i>	<i>N/P</i>
Document Management	<i>N/P</i>	<i>N/P</i>	<i>N/P</i>

<b>LSS</b>	<b>Platform Names</b>		
<b>Standard</b>	PCs	Network Servers (LAN)	Mid-Size
User Interface	<i>N/P</i>	<i>N/P</i>	<i>N/P</i>
Operating System	Windows/DOS	Netware	Open VMS, MVS/XA, O/S400, AIX
Communication Management	<i>N/P</i>	TCP/IP, DECNet, FDDI Ring	<i>N/P</i>
Database (and/or file) Management	<i>N/P</i>	<i>N/A</i>	Oracle
Transaction Monitor	<i>N/A</i>	<i>N/A</i>	<i>N/P</i>
Document Management	<i>N/P</i>	<i>N/P</i>	<i>N/P</i>

**Table 5-2: Current System Standards (cont'd.)**

<b>MDE</b>	<b>Platform Names</b>		
<b>Standard</b>	SWAN 486DX2 PCs	Network Servers (LAN)	SUN SPARC20 Midrange
User Interface	<i>N/P</i>	<i>N/P</i>	<i>N/P</i>
Operating System	Windows/DOS	Netware, NT	SunOS
Communication Management	<i>N/P</i>	Netware	<i>N/P</i>
Database (and/or file) Management	MS-Access	<i>N/A</i>	DB2, RRI FMD
Transaction Monitor	<i>N/A</i>	<i>N/A</i>	<i>N/P</i>
Document Management	<i>N/P</i>	<i>N/P</i>	<i>N/P</i>

<b>NSLDS</b>	<b>Platform Names</b>			
<b>Standard</b>	PCs	Network Servers (LAN)	IBM 3174 Midrange	IBM 9672 Mainframe
User Interface	<i>N/P</i>	<i>N/P</i>	<i>N/P</i>	TN3270
Operating System	Windows/DOS	<i>N/P</i>	<i>N/P</i>	OS/390
Communication Management	<i>N/P</i>	Token Ring, SNA	<i>N/P</i>	<i>N/P</i>
Database (and/or file) Management	<i>N/P</i>	<i>N/A</i>	<i>N/P</i>	DB2
Transaction Monitor	<i>N/A</i>	<i>N/A</i>	<i>N/P</i>	<i>N/P</i>
Document Management	<i>N/P</i>	<i>N/P</i>	<i>N/P</i>	<i>N/P</i>

<b>PGRFMS</b>	<b>Platform Names</b>			
<b>Standard</b>	PCs	Network Servers (LAN)	SUN SPARC20 Midrange	Amdahl 5990 Mainframe
User Interface	Windows-95 – Telnet	<i>N/P</i>	<i>N/P</i>	<i>N/P</i>
Operating System	Windows-95	NetWare	SunOS	MVS/ESA
Communication Management	TCP/IP	Ethernet	<i>N/P</i>	Telnet, TCP/IP
Database (and/or file) Management	<i>N/P</i>	<i>N/A</i>	<i>N/P</i>	VSAM
Transaction Monitor	<i>N/A</i>	<i>N/A</i>	<i>N/P</i>	TSO
Document Management	WordPerfect, MS-Word	<i>N/P</i>	<i>N/P</i>	<i>N/P</i>

**Table 5-2: Current System Standards (cont'd.)**

<b>PEPS</b>	<b>Platform Names</b>			
<b>Standard</b>	PCs	Network Servers (LAN)	Network Servers (LAN)	HP 9000 T600 Mid-Range
User Interface	Developer/2000 RT	<i>N/P</i>	<i>N/P</i>	<i>N/P</i>
Operating System	Windows/DOS	NT	HP-UX	HP-UX 10 20
Communication Management	<i>N/P</i>	Ethernet, FDDS	TCP/IP	<i>N/P</i>
Database (and/or file) Management	<i>N/P</i>	<i>N/A</i>	<i>N/P</i>	Oracle 7
Transaction Monitor	<i>N/A</i>	<i>N/A</i>	<i>N/P</i>	<i>N/P</i>
Document Management	<i>N/P</i>	<i>N/P</i>	<i>N/P</i>	<i>N/P</i>

<b>TIVWAN</b>	<b>Platform Names</b>		
<b>Standard</b>	PCs	Network Servers (LAN)	IBM 9672 R49 Mainframe
User Interface	Windows	<i>N/P</i>	3270
Operating System	Windows/DOS	<i>N/P</i>	OS/390 V1.3
Communication Management	<i>N/P</i>	<i>N/P</i>	LU62
Database (and/or file) Management	Sequential	<i>N/A</i>	DB2, VSAM
Transaction Monitor	<i>N/A</i>	<i>N/A</i>	CICS, TSO
Document Management	ROBOHELP, Word 97	<i>N/P</i>	MS-Word, Visio, ARL

**Table 5-2: Current System Standards (cont'd.)**

## 5.2 Comparison with Architecture Principles

This subsection compares the current SFAP systems technology view with related architecture principles defined in the *SFAP Enterprise Information Technology Framework: Business Drivers and Architecture Principles* document. Each principle is listed along with associated comments highlighting areas where current systems do not fully support the principle.

### **Principle 4. Architecture Enforcement:**

The information systems and technology infrastructure implemented by SFAP will be compliant with the SFAP Enterprise Architecture and COE described within.

#### **Comments:**

LOS, LCS, CDS, and PEPS are substantially compliant with the standards and services as defined in the *Project EASI/ED COE*. The SFAP architecture principles envision an object-oriented architecture. They also envision an architecture that allows students easy access to the systems via the Internet and allows SFAP business partners, to communicate with ED by incorporating electronic commerce capabilities. They envision a system that is well integrated with one normalized authoritative data repository. Eventhough individual SFAP systems comply with COE standards and services, none of the current Title IV systems fully support the SFAP enterprise architecture.

#### **Systems Affected:**

CBS, CPS, EDExpress, FFEL, LCS, LOS, LSS, MDE, NSLDS, PEPS, PGRFMS, TIVWAN

### **Principle 5. Use Industry Proven Technology:**

Information technology applications and technical infrastructure decisions must be based on industry proven and supported components, methods, standards, and tools consistent with industry technological and market direction and as defined by this architecture.

#### **Comments:**

Although most of the current Title IV systems have been developed using industry proven and supported technologies and components, many are not consistent with current technology and market trends. For example, IDMS or VSAM file structures represent technologies that have existed in the industry for years and are considered mature and dependable, but they do not reflect modern industry practices and vendor products. Similar comments could also be made about those systems based on monolithic COBOL application software.

#### **Systems Affected:**

CBS, CPS, LSS, FFEL, TIVWAN

**Principle 6. No Vendor Bias:** Standards and technology choices will be based on vendor-neutral standards where they are available and realistically can be implemented. Products will be chosen from any vendor with strong business stability, who provides the best technology and service for a business need and whose products are compliant with its architecture standards.

**Comments:**

SFAP systems comprise products from many vendors whose products are not mutually compatible. Therefore, technology choices for current systems often cannot be vendor-neutral. Few of the products need to develop and maintain SFAP systems could be considered commodity purchases.

**Systems Affected:**

CBS, CDS, CPS, FFEL, LCS, LOS, LSS, MDE, NSLDS, PEPS, PGRFMS

**Principle 8. Access to Information:**

Timely access to information and the tools and applications required to access and manipulate that information will be available to all individuals unless there is a specific, compelling reason to restrict access.

**Comments:**

Currently, students, schools, guarantors and lenders cannot access up-to-date information. The current systems have been developed independently to support specific functions and without a common technical architecture. This makes it more difficult for ED and the external community to interact easily, cost effectively, and efficiently. The current infrastructure does not present a consistent, uniform, and integrated security and access control mechanism across all systems and applications. Also, the current network components do not adhere to a common SFAP networking standard for protocols, addressing, and security.

**Systems Affected:**

CBS, CDS, CPS, EDEExpress, FFELP, LOS, LCS, LSS, MDE, NSLDS, PGR/FMS, PEPS, TIVWAN

**Principle 9. Reduce Integration Complexity:** Products, tools, designs, applications, and methods will be selected to reduce integration and infrastructure complexity.

**Comments:**

Current SFAP systems operate on diverse hardware platforms, use a wide range of system and application software, and do not adhere to a common technical architecture. The use of different platforms, software and architecture increases integration and infrastructure complexity. This diversity contributes to system interoperability issues, affects the ability of systems to accommodate new system requirements, and affects the system's ability to benefit from advances in technology that help simplify systems integration.

**Systems Affected:**

CBS, CDS, CPS, EDExpress, FFEL, LCS, LOS, LSS, MDE, NSLDS, PEPS, PGRFMS, TIVWAN

**Principle 16. Structure of Business Applications:**

Application design shall be based on a partitioned logical model (presentation, application logic, database) with firm logical boundaries established between the partitions.

**Comments:**

Many of the current Title IV systems operate in a mainframe, monolithic batch processing environment. Therefore, they are not natural candidates for n-tiered application design. The current systems' architectures adversely affect their ability to be clearly separated into distinct application software layers.

**Systems Affected:**

CBS, CPS, FFELP, LSS, NSLDS, PGRFMS, TIVWAN

**Principle 17. Reuse and Components:**

Opportunities will be identified for cross-functional, integrated systems and these systems will be implemented to take advantage of standard components that can be shared and reused throughout SFAP for similar business functions.

**Comments:**

None of the current Title IV systems were designed using a component-based strategy or with system functionality and/or code reuse issues in mind.

**Systems Affected:**

CBS, CDS, CPS, EDExpress, FFELP, LOS, LCS, LSS, MDE, NSLDS, PGRFMS, PEPS, TIVWAN

## **Principle 19. Presentation Consistency:**

All presentation user interfaces will adhere to SFAP's standard graphical user interface to have a consistent look and feel. Presentation layer interfaces will be consistent across local and remote access.

### **Comments:**

Due to the lack of a SFAP-wide design framework, none of the current SFAP systems adhere to a common SFAP-wide graphical user interface standard. None of the systems were designed using a style guide except FAFSA on the Web.

### **Systems Affected:**

CBS, CPS, FFELP, CDS, LCS, LOS, LSS, PGRFMS, NSLDS, PEPS, TIVWAN

## **Principle 20. Object-oriented Design and Structure:**

Where practical, applications shall be designed using objects, which encapsulate data structures and present a functional interface to application.

### **Comments:**

None of the current systems use the object-oriented paradigm to implement major system functionality. There are a few instances where applications such as PowerSoft's PowerBuilder and C++ are used for application development but these applications represent a small percentage of the total number of SFAP applications.

### **Systems Affected:**

CBS, CDS, CPS, FFEL, LOS, LCS, LSS, MDE, NSLDS, PEPS, PGRFMS, TIVWAN

**Principle 22. Use of Automated Development and Testing Tools:** Standardized information systems tools will be used across SFAP for business modeling, systems design, development, and configuration management. Application development and testing will maximize their reliance on automated tools.

**Comments:**

Sterling Software's COOL suite of products has been selected as a standard for application development within SFAP. Several SFAP systems (CDS, LOS, LCS, NSLDS) have been developed using Composer by IEF, and are therefore compatible with the COOL products. In addition, PEPS has been developed using the Oracle Designer/2000 CASE tool. However, none of the systems employ automated testing capability and each system has its own Configuration Management (CM) processes & tools.

**Systems Affected:**

CBS, CDS, CPS, EDEXpress, FFEL, LOS, LCS, LSS, MDE, PEPS, PGRFMS, TIVWAN

**Principle 24. Network Design:** All network components will adhere to the SFAP network standards for protocols, addressing, and firewall security. Any SFAP desktop will be logically able to access any application and database within the SFAP computing environment, within security and operational considerations

**Comments:**

Currently, none of the Title IV systems provide the capability for desktop access to other applications or databases within the SFAP computing environment using the envisioned Web browser based technology (as envisioned in the SFAP architecture principles) and the underlying TCP/IP network protocol. The current systems permit network access utilizing a variety of standards, components, products and protocols. However, this network access is limited to access within a particular system, not across systems and programs. A SFAP-wide security and access policy does not currently exist.

**Systems Affected:**

CBS, CDS, CPS, FFEL, LCS, LOS, LSS, MDE, NSLDS, PGRFMS, PEPS, TIVWAN

**Principle 25. Electronic Commerce:** Standards-Based electronic links will be the preferred means of transacting business and communicating with partners and customers as required.

**Comments:**

Currently, none of the SFAP systems are setup to provide electronic commerce capabilities. Most SFAP systems do not support the mainstream data format and security standards required to support Web browser based electronic commerce applications. However, work is currently underway to web-enable access to certain systems (e.g., LSS, NSLDS) and to map current transaction formats for some systems to Electronic Data Interchange (EDI) transaction sets (e.g., LOS, FFELP, RFMS).

**Systems Affected:**

CBS, CDS, CPS, FFEL, LCS, LOS, LSS, MDE, NSLDS, PGRFMS, PEPS, TIVWAN

**Principle 26. Common IT infrastructure:**

SFAP will implement a common IT infrastructure for its systems. Applications will operate on this infrastructure.

**Comments:**

None of the Title IV systems are built to operate on a common SFAP wide infrastructure or operating environment.

**Systems Affected:**

CBS, CDS, CPS, FFEL, LCS, LOS, LSS, MDE, NSLDS, PGRFMS, PEPS, TIVWAN

## 6. SECURITY VIEW

The security view shows the security protection components of current Title IV systems. It lists which users have access to what information, how sensitive the information is and what products and standards are used to protect this information from external threats.

Subsection 6.1 defines major user classes of the Title IV systems and the level of access each user class has to the data groupings defined in section 3 of this document. Subsection 6.2 documents the security products and standards used within the Title IV systems. Section 6.3 lists any inconsistencies between the architecture principles and the information listed in the security view.

### 6.1 User Classes

Several classes of users with different types of information access rights access information resident in the Title IV systems. Table 6-1 lists and defines the different user classes. This list of user classes is based on the information documented in the *Project EASI/ED Current Systems Models, Volume I and II* document.

The SFAP systems do not contain information (i.e., Top Secret, Secret, or Classified) that requires national security information clearance and secure data handling and transmission procedures; rather, most data is Sensitive, But Unclassified (SBU). ED is required to protect the privacy of individual participant information that forms the core data in the SFAP systems as the data is subject to constraints defined by the Privacy Act of 1974. Furthermore, security encompasses protection of business sensitive data relating to the various organizations participating in the postsecondary education community (e.g., schools, lenders, guarantors, state grant agencies, secondary markets).

Table 6-2 shows the access rights the user classes have with respect to the data groups defined in section 3, Information View. It also shows if the data in the data groups is Private or Proprietary or both Private and Proprietary based on the following definitions.

- **Private:** The data group requires security to protect the privacy of individual participants.
- **Proprietary:** The data group requires security to protect business sensitive data.
- **Private and Proprietary:** The data attribute requires security to protect the privacy of individual participant information and to protect business sensitive data.

User Class	Definition
Participants	An individual associated with SFAP who is either the beneficiary of a financial loan, or an applicant (borrower) for financial aid, or the endorser for a loan, or the co-owner for a loan. Includes the student's address, their financial aid eligibility and their current enrollment status.
Institutions	An accredited organization that participates, or desires to participate in a Title IV aid program administered by the US Department of Education.
ED	<p>The US Department of Education including the following offices:</p> <ul style="list-style-type: none"> <li>• Accounting and Financial Management Staff (AFMS)</li> <li>• Chief Financial Office (CFO)</li> <li>• Debt Collection Service (DCS)</li> <li>• Guarantor and Lender Oversight Service (GLOS)</li> <li>• Institutional Participation and Oversight Service (IPOS)</li> <li>• Program Systems Service (PSS)</li> <li>• Policy, Training and Analysis Branch (PTAS)</li> </ul>
Lenders	A primarily private financial institution that provides money for loans.
Guarantors	A federal or state entity that guarantees the repayment of student loans to the lenders.
School Servicers	An organization which performs the activities required to manage loan portfolios for schools.
Lender Servicers	An organization which performs the activities required to manage loan portfolios for lenders.
Accrediting Agencies	A commercial organization that accepts or approves an educational institution.

**Table 6-1. SFAP User Classes**

Data Groups	Grants	Loans	Transactions & Ledgers	Aid Applications	Aid Programs	Institutions	Packages	Participants	Prom Notes	Resources	Lenders, GA's & Servicers	Accrediting Agencies	State Grant Agencies
	Private & Proprietary	Private & Proprietary	Private & Proprietary	Private	Private	Proprietary	Private & Proprietary	Private & Proprietary	Private & Proprietary	None	Proprietary	Proprietary	Proprietary
	Information Type	User Class											
Participants		R <sup>2</sup>		C,R,U				R					
Schools	R,U	C,R,U	R	C,R,U		R	C,R,U,D	C,R,U					
Lenders		C,U						C,U <sup>3</sup>			U		
Guarantors		C,R,U						C,R,U <sup>4</sup>			R,U		
ED	C,R,U,D	C,R,U,D	C,R,U,D	C,R,U,D	C,R,U,D	C,R,U,D	<sup>5</sup>	C,R,U,D	C,R,U,D	C,R,U,D	C,R,U,D	C,R,U,D	C,R,U,D
State Grant Agency													
Lender Servicers		C,U						U			U		
School Servicers <sup>6</sup>	U	C,U		C,U				U					

**Table 6-2. User Classes Access to Data Groups**

<sup>2</sup> Assumes LSS Internet Web Page is up and running.

<sup>3</sup> FISL loans transferred to ED from lenders, constitute the primary create and update components of this entry.

<sup>4</sup> Guarantors update NSLDS with FFEL data.

<sup>5</sup> EDExpress packaging databases maintained by schools.

<sup>6</sup> School Servicers use same access rights as schools but with no read capability.

## 6.2 Security Products and Standards

Most of the current Title IV systems were developed without the requirement to adhere to an overall technical architecture or set of security standards. As a result the systems operate on a wide range of system and application software using different security products. Due to the lack of SFAP security architecture standards and from the information received on the architecture inventory questionnaire, most of the systems use operating level security provided by the operating system.

Some of the systems (PGRFMS, PEPS, MDE, NSLDS, and TIVWAN) use Resource Access Control Facility (RACF). IBM's RACF has been a premier product for securing valuable corporate data. RACF protects the systems vital system resources and controls what users can do on the operating system. RACF provides these current SFAP systems with the following security functions:

- Identify and verify system users.
- Authorize the users who need access to the resources you've protected.
- Control the means of access to these resources.
- Log and report unauthorized attempts at gaining access to the system and to the protected resources.
- Administer security to meet the installation's security goals.

### 6.3 Comparison with Architecture Principles

This subsection compares current Title IV systems security view with architecture principles defined in the SFAP's *Enterprise Information Technology Framework: Business Drivers and Architecture Principles* document. Each principle is listed along with associated comments highlighting areas where the current systems do not fully support the principle. Also, it lists the system that are affected by architecture principle.

#### **Principal 23. Common Security Access:**

The infrastructure will present a consistent, uniform, and adequate security mechanism across all applications, data access, and related components independent of physical location. Technologies such as a single logon with a database for profile definition and token-based authentication will be incorporated when applicable.

##### **Comments:**

A few of the current systems, namely, PGRFMS, PEPS, MDE, NSLDS and TIVWAN currently utilize IBM's RACF. Since 1976, RACF has been a premier product for security data resources and user access. But with SFAP's envisioned open system web-based access environment, the current security using RACF's will have to be reevaluated. In addition, SFAP will need to develop organization-wide common security standard measures, procedures, and change management and monitoring processes.

The envisioned Internet-based target environment will bring new security and integrity challenges in terms of identification, authentication, authorization, and logging/reporting functionality. It will also introduce a host of new technologies such as Internet firewalls and digital signatures. These current Title IV systems if re-used in the new environment will need to be examined and effectively interface with the added web-enabled technologies and Internet based open systems security challenges.

##### **Systems Affected:**

CBS, CDS, CPS, FFELP, LCS, LOS, LSS,

#### **Principal 28. Security Policy:**

Security policies and practices will be consistently implemented to ensure the confidentiality, integrity, and availability of SFAP data and systems. Policy monitoring and coordination of system-wide security measures and contingency plans will be the responsibility of SFA-level management.

##### **Comments:**

See comments for Principle 23.

## 7. SUMMARY

To help prioritize future application opportunities, an assessment of the current SFAP application systems was performed. The assessment of the current systems was based on the following three criteria defined by the TAFIM:

- **Technical Quality:** This assessment criterion measures the systems robustness and maintainability. It is a measure of whether the system is well written with easy-to-follow, structured code and sufficient program comments to facilitate enhancements or maintenance.
- **Strategic Value:** This assessment criterion measures the degree to which the current system supports the strategic objectives of ED as defined in the *US Department of Education Strategic Plan*. Specifically, it measures how well the system supports the Web-enables access, whether the system is Year 2000 compliant, and how well it meets the industry wide standards for data exchange. It also measures if the system supports the concept of a single point of contact for users.

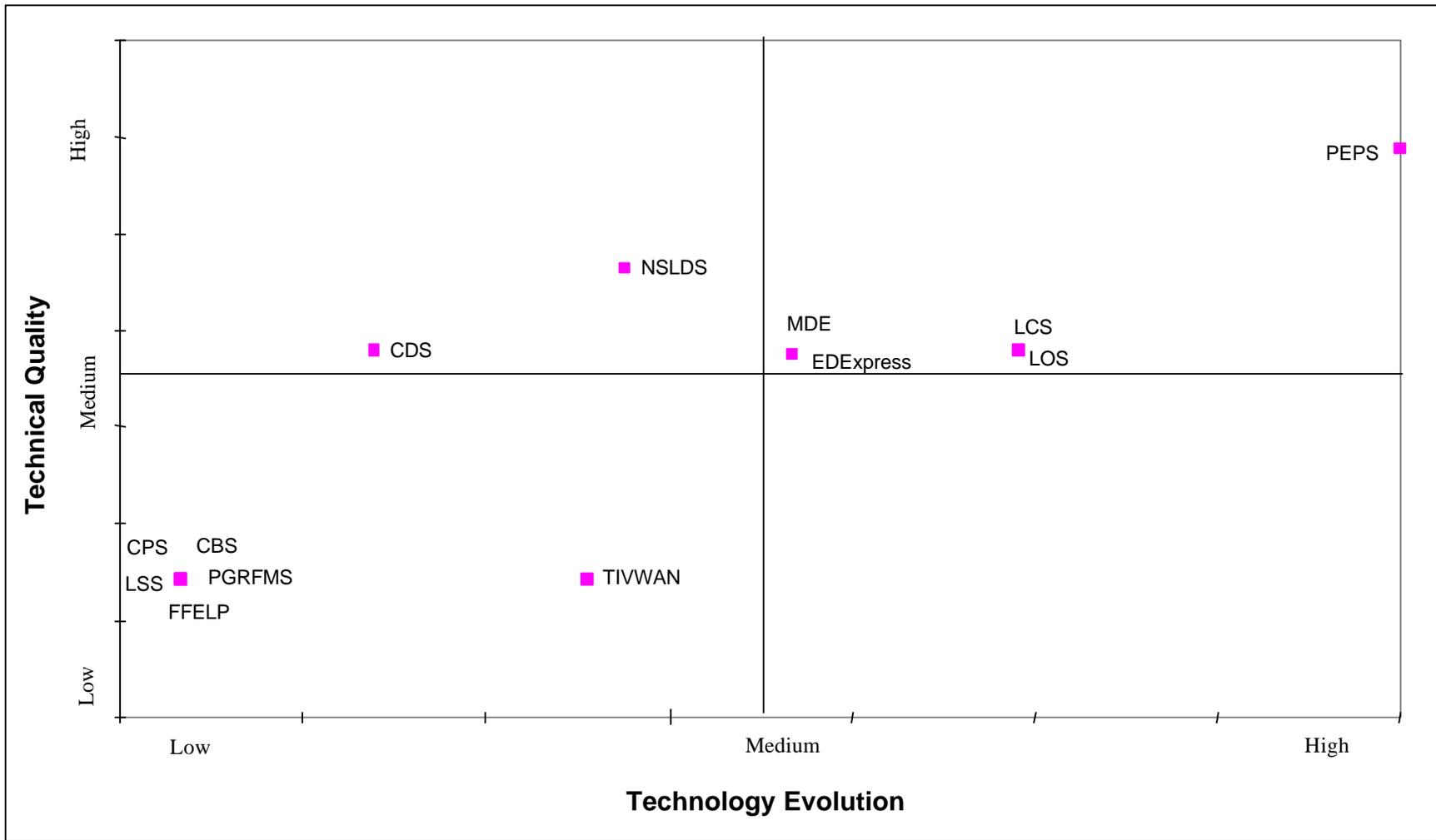
Additionally, this criterion also measures the degree to which the current system supports the strategic objectives of Project EASI as defined in the *Project EASI Concept Document*, and if the system complies with the common operating environment described in the *Project EASI/ED COE Document*.

- **Technical evolution:** This assessment criterion measures the system's positioning to evolve effectively into the target architecture and to take advantage of envisioned advances in information technology. For example, a system that is written for a hardware environment and language that will become part of the target technology architecture would normally have a higher technology evolution rating than one that is written for an environment that will not be carried forward into the target environment. Likewise, a system that is written in a "portable" language would have a higher evolution rating.

These criteria were mapped in the following pairs on four-quadrant matrices to allow a high-level determination of the recommended disposition of each application:

- Figure 7-1: Technical Quality vs. Technical Evolution Assessment
- Figure 7-2: Technical Quality vs. Strategic Value Assessment

The combination of this information was used to create an overall assessment, shown in Figure 7-3. Details of the assessment of each of the current SFAP systems against the evaluation criteria are described in Appendix D.



**Figure 7-1. Technology Quality vs. Technology Evolution Assessment**

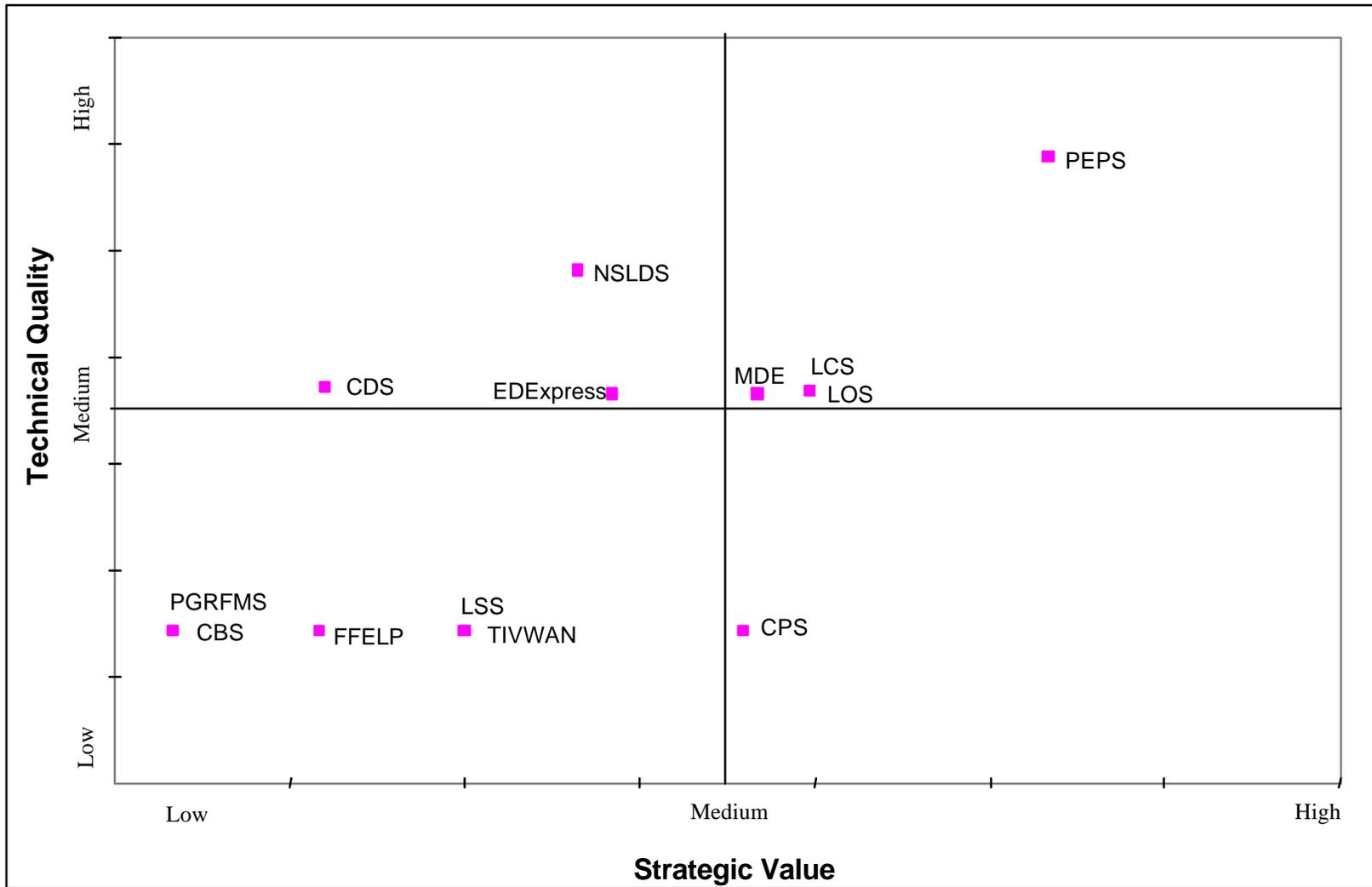


Figure 7-2. Technology Quality vs. Strategic Value Assessment

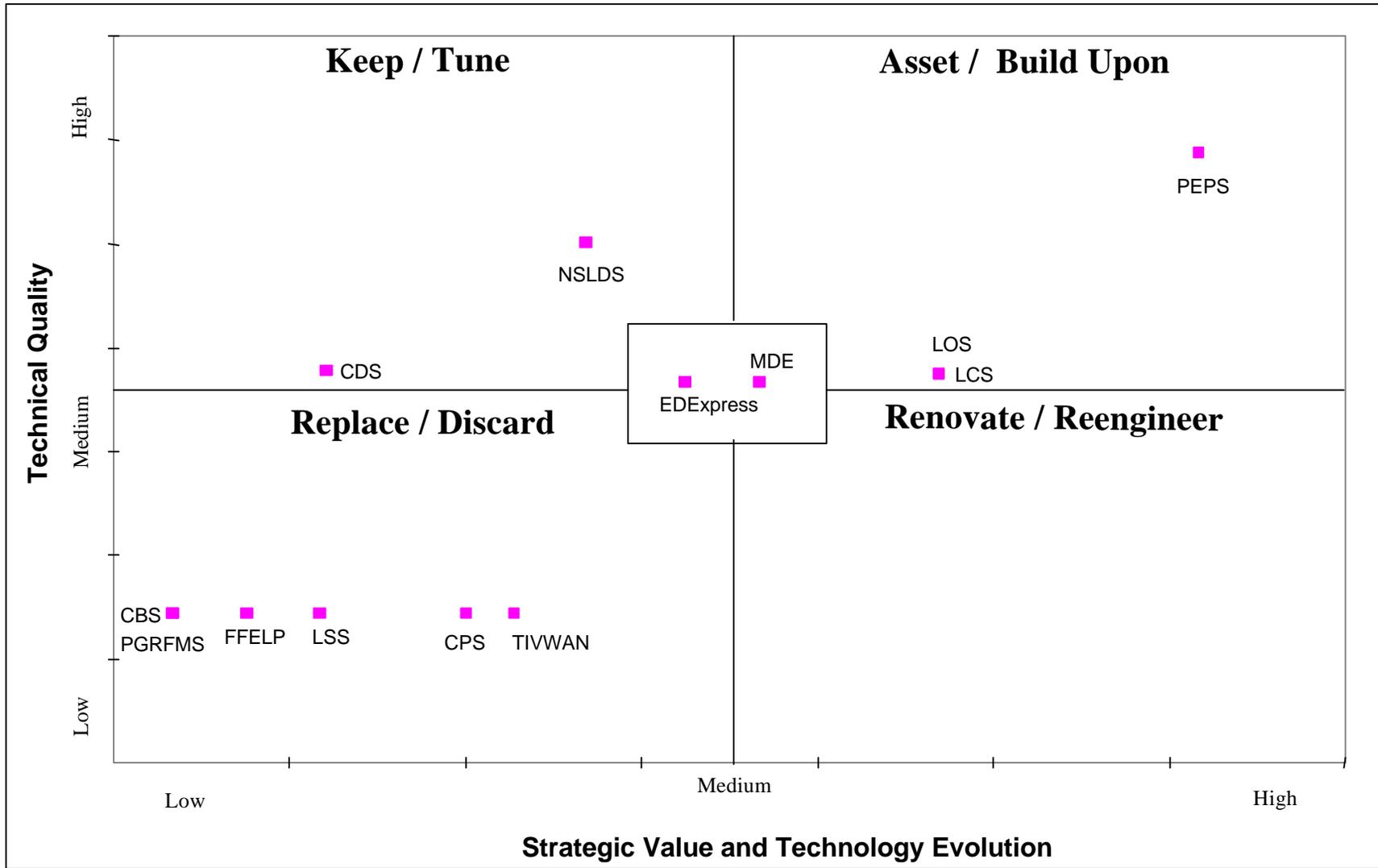


Figure 7-3. Overall Assessment

Within Figure 7-3, each current SFAP system is classified in a quadrant that most appropriately represents the combined classifications from Figures 7-1 and 7-2. Each quadrant within Figure 7-3 is defined as follows:

- **Replace or discard (Lower left Quadrant):** The system has low technical quality, technical evolution, and strategic value. If the application is absolutely necessary to the business, it should be completely replaced with a newly developed application or purchased package.
- **Renovate/reengineer (Lower Right Quadrant):** The application has low technical quality but high strategic value and operates in a technical environment that can evolve into the target architecture relatively effectively. The application might be given a revamped user interface for improved usability or possibly the programs can be restructured for better reliability and maintainability, perhaps utilizing some reverse engineering tools.
- **Keep/tune (Upper Left Quadrant):** The system has high technical quality but low strategic value and is written in an environment that will be difficult to evolve into the target architecture. Because the application is technically sound and the users seem satisfied currently, keep the application as is for now doing minimal tuning and maintenance to keep it running.
- **Asset/build upon (Upper Right Quadrant):** The application has high technical quality and strategic value, and it operates in an environment that can evolve into the target architecture relatively effectively. It should be retained as one of the core applications upon which to build. Applications that fall into the other three categories above should begin to migrate into this category as they are redeveloped, replaced, or converted over the agreed-upon architecture implementation interval.

Based on the ratings shown in Figure 7-3 the current SFAP systems can be clustered into the following six groups:

#### 1. **Replace/Discard:**

##### Systems:

CBS, CPS, FFELP, LSS, PGRFMS, TIVWAN

##### Rationale:

Despite scoring high in robustness, these systems were rated low in technology quality due to the relatively high technical complexity and cost involved in maintaining and enhancing them. The systems operate in a monolithic environment and most of them provide very little on-line interaction for ED and community users. These systems scored low in technical evolution primarily due to the relative difficulty they have in adopting new technologies, and because they demonstrated some major inconsistencies with respect to the SFAP architecture principles.

Generally these systems scored relatively low in strategic value. They are not in an effective position to support ED's strategic objectives, including enabling Internet access, fostering innovation in business processes, encouraging interagency coordination, and supporting the concept of a single point of contact on all matters of financial aid. CPS was the exception within this group, rating medium in strategic value.

The systems within this group should be considered for replacement. They will be difficult to evolve into the target environment envisioned by the SFAP architecture principles, and are not generally simple enough to maintain to warrant keeping in place with just necessary maintenance (i.e. the Keep/Tune strategy).

## **2. Keep/Replace:**

### **System:**

CDS

### **Rationale:**

CDS falls on the borderline between Replace/Discard and Keep/Tune. Although CDS runs in a monolithic, heavily batch-oriented environment, the system was rated average in robustness, maintainability, and scalability. CDS also scored relatively well in its capability to accommodate technology advances, and in its positioning relative to widely supported vendor standards. The extent to which the system supports Internet-based access, innovation in postsecondary education, a customer service focus, and a single point of interface for all financial aid matters led it to score low in the strategic value criterion.

Depending on decisions made in regard to other SFAP systems (in particular LCS and LOS), CDS should be replaced with a new system, or kept as-is with minimal tuning and maintenance.

## **3. Keep/Tune:**

### **System:**

NSLDS

### **Rationale:**

NSLDS scored fairly highly in technology quality, largely due to its model-based approach to development. The system can be considered state-of-the-art as far as mainframe based application development environments are concerned, but its monolithic, procedural, and heavily batch-oriented design will be difficult to transition to the target environment envisioned by the SFAP architecture principles.

NSLDS should be kept in its current state in the near term, with minimal enhancements and tuning, and longer-term opportunities should be identified to replace or reengineer it.

#### 4. Middle Ground:

**System:**

EDEExpress, MDE

**Rationale:**

Both EDEExpress and the MDE fell squarely in the middle of the assessment in all categories. Their technology is generally widely supported by vendors, and could relatively easily be migrated into the target environment envisioned by the SFAP architecture principles. Both systems have features that go some way to support and ED and Project EASI strategic objectives.

These systems can be kept or replaced as circumstances direct. In practice decisions on both EDEExpress and MDE will be heavily influenced by decisions on the future of CPS.

#### 5. Asset/Reengineer:

**System:**

LOS/LCS

**Rationale:**

Both LOS and LCS have been developed with modern technology, and would be relatively simple to migrate to the target environment. They received good strategic value scores since they are substantially in compliance with the *Project EASI/ED COE* and should be relatively easily Web-enabled.

The systems have a medium technical quality rating, which puts them on the border between the Asset/Build and Renovate/Reengineer quadrants. Based on ED's long term plans for the Direct Loan systems as a whole, LOS and LCS should either be retained and enhanced, or alternatively should be renovated/reengineered into an environment that is specifically designed to meet the availability, scalability, and Internet access requirements that ED anticipates.

#### 6. Asset/Build Upon:

**System:**

PEPS

**Rationale:**

PEPS encompasses modern technology such as Developer/2000, Oracle 7, TCP/IP, FDDI and Ethernet that would be easily migrated into the target environment. It has relatively high technical quality, is relatively consistent with the SFAP architecture principles, and is positioned to support ED and Project EASI strategic goals from the point of view of Internet-enabled information access and innovation in postsecondary education.

PEPS should be retained as an asset and built upon.

The *Baseline Characterization* document is intended to inventory and describe the current SFAP systems, not to provide an action plan for future systems development. As such, the recommendations here are not intended to replace more detailed target architecture and migration planning steps. Instead, they highlight the current position of each system relative to an anticipated target environment, and can help prioritize future application opportunities.

Also, the analysis presented in this section considers each system in isolation, based purely on its own merits. The recommendations made through this classification do not address the dependencies and relationships among current systems, and between current systems and external organizations. While this analysis focuses on maximizing the value of each system when viewed in the context of an envisioned target environment, individual recommendations that make sense when considered purely in the context of a single system may not be in the best interests of SFAP as whole.

SFAP must also consider the issues in attempting to maximize the overall value of the IT portfolio across all systems. SFAP-wide objectives such as data standardization and integration and cross-program business process reengineering may dictate that different short or long term decisions are appropriate.