# 1 INTRODUCTION

This section provides an overview of the *Project EASI/ED Data Standards Comparison Matrix.* It describes the document's purpose and provides background for the comparison of the Project EASI/ED (Easy Access for Students and Institutions/ US Department of Education ) Logical Data Model (LDM) to four existing standards and databases.

## 1.1 Overview

Project EASI is an effort by ED and by members of the external postsecondary education community to define and implement a customer focused -- versus provider focused -- "system" to support postsecondary education. Within the Project EASI, Project EASI/ED is ED's initial effort to implement the Project EASI vision within ED's information systems and processes.

Project EASI/ED began in January 1995 when a team of ED staff and representatives of the external postsecondary education community -- the Project EASI Core Team -- began defining the Project EASI vision. The team defined the following four objectives for Project EASI.

- **Create a customer focused "system" to support postsecondary education**. While the desire is to maximize the use and value of available automation, this "system" will also include manual support and processes as required to effectively reach all customers.

- **Provide the customer a single point of interface with the postsecondary education community**. Today, students, prospective students, and their families are required to deal with many separate organizations whose activities are largely uncoordinated. Creating a single point of interface with the postsecondary education community is expected to simplify interaction, and to improve the community's effectiveness in supporting customers and in executing business relationships with students and financial aid recipients.

- **Streamline, simplify, and improve the accessibility of processes associated with postsecondary education**. The processes associated with postsecondary education -- and particularly with delivery and management of postsecondary financial assistance -- are complex, paper intensive, and expensive to administer. Project EASI is intended to provide more flexible, simplified, and universally applicable processes to support postsecondary education.

- **Reduce costs associated with the management and delivery of services associated with postsecondary education**. The complexity and redundancy of current processes -- especially those associated with delivering and managing student financial assistance -- make them resource intensive (e.g., staff, information systems, time). By improving these processes and the efficiency with which technology can be applied by all involved organizations, Project EASI is expected to lower costs for all participants.

In January 1997, *the Project EASI Concept Document* was initially published to baseline a shared understanding of the Project EASI vision. The *Project EASI Concept Document* marked the end of the

concept phase of the system development life cycle. At that point, Project EASI/ED was initiated with commencement of the definition phase of its life cycle. Project EASI/ED is ED's initial effort to implement the Project EASI vision in the systems and processes used to manage and deliver Title IV aid. While EASI/ED is focused on the Title IV aid programs, its goal is to define processes and systems that might readily accommodate other, non-federal aid programs at a later time (e.g., state aid, private aid). The early stages of definition phase encompassed the identification of functional and data requirements for EASI/ED. The resulting *Project EASI/ED Business Area Requirements Document (BARD*), published July 1997, identified the high-level functional and entity type requirements for the project. Following completion of the *Project EASI/ED BARD*, Project EASI/ED continued through the definition phase by completing the activities listed below.

- Development of a Logical Data Model that represents the data required at the enterprise level.
- Identification and definition of internal and external interface requirements between Project EASI/ED and external entities.
- Identification of physical access requirements for user access to each application system.
- Definition of a Common Operating Environment (COE).
- Development of a Transition Plan.

## 1.2 Purpose

The purpose of the Data Standards Comparison Matrix is to obtain the postsecondary education community support of voluntary data standards for Project EASI/ED. To accomplish this, information about each attribute, i.e. metadata, within the Project EASI/ED LDM was compared to data elements used in the following existing data standards and databases.

1. US Department of Education Central Database Subsystem (CDS)
2. National Center for Education Statistics (NCES) Postsecondary Student Data Handbook (PSDH)
3. CommonLine
4. American National Standards Institute (ANSI) Accredited Standards Committee (ASC) X12 transaction sets applicable to student financial aid.

## 1.3 Document Organization

The remainder of the Project EASI/ED Data Standards Comparison Matrix comprises the sections described below.

- **Section 2 – Data Standards Development.** Describes the technical approach used for the Project EASI/ED data standardization.
- **Section 3 – Technical Review Results.** Details LDM attribute classifications and corresponding technical review feedback.
- **Appendix A – Acronyms and Definitions.** Lists the acronyms and definitions used within this document.
- **Appendix B – Data Type Walkthrough.** Cross-references the data types within the LDM and each of the data standards or databases.
- **Appendix C – References.** Cites the principal references used in developing this document.
- **Appendix D – Data Standards Comparison Matrix.** Presents the LDM attributes with their corresponding mapped data standard data elements and technical review comments.

# 2 DATA STANDARDS DEVELOPMENT

This section identifies assumptions that affected the definition of the technical approach (subsection 2.1). In addition, it describes the technical approach used to map Project EASI/ED LDM attributes to data elements found in the CDS, CommonLine, PDSH, and X12 EDI transaction sets (subsection 2.2).

## 2.1 Assumptions and Constraints

Several assumptions and constraints affected the definition of the technical approach and are listed below.

- The four data standards contain design and construction-level data elements that do not have counterparts in a logical data model such as the Project EASI/ED LDM.
- The four data standards include data elements that originate from business processes that have been or will be reengineered under Project EASI/ED.
- The four data standards include data elements that originate from business processes that fall outside the scope of Project EASI/ED.
- The mappings detailed in the matrix do not demonstrate whether a particular CommonLine or X12 EDI transmission can be built entirely based on the Project EASI/ED LDM attributes.
- The CDS physical data model was built to support the Direct Loan program while the Project EASI/ED Logical Data Model is designed to support all Title IV programs in a re-engineered business and technical environment.

## 2.2 Technical Approach

This subsection identifies the technical approach used to map Project EASI/ED LDM attributes to data elements in the CDS, CommonLine, PDSH, and X12 EDI transaction sets. For a graphical representation of the standard-independent technical approach, refer to Exhibit 2-1.

**Exhibit 2-1: Project EASI/ED Data Standardization Steps**

**Step 1 - Review the LDM**

The Project EASI/ED LDM was reviewed to ensure familiarity with its subject areas, entity types, relationships, and attributes. The LDM presents the data needed to support the functional and data requirements identified in the *Project EASI/ED BARD*. The LDM also defines the data required for Project EASI/ED to the attribute level, and identifies relationships among the required data. The LDM is documented in the *Project EASI/ED Logical Data Model Document (LDMD)*, published May 15, 1998.

**Step 2 - Review the format, structure, and available metadata for the four data standards**

The specifications and the documentation available for CDS, CommonLine, PSDH, and EDI transaction sets were reviewed. The specific referenced sources for the four data standards are listed below in Exhibit 2-2.

| Data Standard | Source |
|---|---|
| CDS | Physical Data Model: DLSS ADMIN SODB V02 R01 A O, Subset PXEERD, June 1, 1997 |
| CommonLine | CommonLine release 3 Reference Manual |
| PSDH | Postsecondary Student Data Handbook (March 1997 Working Draft) |
| EDI transaction sets | A Guide to the Implementation of Electronic Data Interchange<br>ANSI ASC X12 Version 4 Release 1 (004010) EDI Transaction Sets |

**Exhibit 2-2: Referenced Sources for the Data Standards**

**Step 3 - Determine the set of student financial aid-relevant EDI data elements (X12 EDI comparison only)**

Because X12 EDI Transaction Sets were developed to support a wide variety of business functions across many industries, a set of student financial aid-relevant EDI data elements was established. The data elements from the X12 EDI transaction sets enumerated below in Exhibit 2-3 were used in this analysis. Several of the ANSI ASC X12 EDI transaction sets are still in development. The most current information available to ED was used in this analysis.

| Transaction Set ID | Transaction Set Name |
|---|---|
| 130 | Student Educational Record (Transcript) |
| 135 | Student Loan Application |
| 139 | Student Loan Guarantee Result |
| 144 | Student Loan Transfer and Status Verification |
| 189 | Application for Admission to Educational Institutions |
| 190 | Student Enrollment Verification |
| 191 | Student Loan Pre-Claims and Claims |
| 194 | Grant or Assistance Application |
| 198 | Loan Verification Information |
| 200 | Mortgage Credit Report |
| 205 | Mortgage Note |
| 501 | Vendor Performance Review |
| 810 | Invoice |
| 820 | Payment Order/Remittance Advice |
| 821 | Financial Information Reporting |
| 828 | Debit Authorization |
| 838 | Trading Partner Profile |

**Exhibit 2-3: ANSI ASC X12 EDI Transaction Sets**

**Step 4 - Compare LDM attributes with data elements from the four data standards**

The LDM attribute comparison to data elements from the data standards and databases was based primarily on the following metadata categories:

- Attribute Name
- Description (where applicable).
- Permitted Values (where applicable)

When one LDM attribute had several complete matches amongst the data elements from a particular standard (excluding EDI), the LDM attribute was "mapped" to the each of the relevant data elements. In the case of EDI where multiple mappings were possible due to the flexibility of the EDI data elements, the most informative "best fit" mapping was selected.

**Step 5 - Document the outcome of the comparison**

The results of the analysis were captured in a matrix showing each LDM attribute with each mapping from the corresponding data standards.

Packages containing the matrix specific to each of the four data standards were sent to Postsecondary Electronic Standards Council (PESC) representatives in July, 1998. The reviewers examined the descriptions and permitted values of the LDM attributes and corresponding "mapped" data standard elements for completeness and accuracy. They provided comments and recommendations of additional mappings.

**Step 6 – Review comparison results with the PESC Committee**

The comments and feedback obtained in Step 6 were incorporated into a comparison matrix which was reviewed with a working group of ED and PESC representatives comprised of registrars, financial aid administrators, lenders, guarantors, software vendors, and loan servicers on August 3-5, 1998 in Washington, D.C. General feedback and comments from the review are listed in Section 3 while LDM attribute specific comments are recorded in the "Comments" column of the final data standards comparison matrix found in Appendix D.

## 2.3 Technical Environment

The LDM attributes and their corresponding mappings to the data standards and databases were maintained in a Microsoft Access database. All comments received from PESC reviewers in July as well as observations made during the August technical review sessions were recorded in this database.

# 3 TECHNICAL REVIEW RESULTS

The Project EASI/ED LDM contains attributes that are further divided into 15 classifications. Each LDM attribute ends with an abbreviated standardized class word from Exhibit 3-1 below. For example, "AID_PERIOD_START_DATE" would be classified as a *date(_DATE)*, "AID_APRV_AMT" would be an *amount(_AMT)*, and "AID_STAT_CAT" is in the *category(_CAT)* class. General comments during the technical review about some of the classifications are detailed in Exhibit 3-1. LDM attribute specific comments are recorded in the "Comments" column of the final data standards comparison matrix found in Appendix D.

| Classification | Abbreviation | Classification Description | Number of LDM Attributes | Comments |
|---|---|---|---|---|
| AMOUNT | AMT | A monetary quantity. Always expressed in whole or fractional portions. | 61 | US dollar amounts are appropriate. Numeric data type with 2 decimal places will be used. |
| CATEGORY | CAT | A classification of data which is not codified and does not require a reference or translation table to become meaningful information | 150 | In some cases permitted values of these LDM attributes should be supplemented by code sets in the 4 standards where noted in Appendix D. |
| CODE | CODE | A differential of a classification of data which requires a reference or translation table to become meaningful information. | 9 | Use the EDI length of 15 for postal code. |
| COUNT | CNT | An integer number indicating a measure in the indicated unit of measure and available for arithmetic use | 3 | No changes in the count general format were recommended. |

| Classification | Abbreviation | Classification Description | Number of LDM Attributes | Comments |
|---|---|---|---|---|
| DATE | DATE | A measurement of time from which year, month, and day may be determined. | 206 | Dates will maintain 8 digits for DD/MM/YYYY.<br>Time will be recorded in a separate attribute. |
| DESCRIPTION | DESC | Data having undefined, free-form, unstructured or unformatted content, including text, alphanumeric and other printable characters. | 44 | Description attributes will have a text data type.<br>It was noted that “memo” fields should be avoided in EDI. |
| IDENTIFIER | ID | One non-intelligence bearing attribute whose purpose is to uniquely identify a kernel entity type. | 14 | No changes in the identifier general format were recommended. |
| IMAGE | IMG | A picture or graphic. | 1 | No changes in the image general format were recommended. |
| INDICATOR | IND | A simple Boolean flag set to “Y” for yes (or true) and “N” for no (or false). | 64 | No changes in indicator general format were recommended. |
| NAME | NAME | A word or phrase that constitutes a distinctive designation for a person, place, thing, concept, or event. | 116 | It was noted that some names will most likely be codified in a physical data model. For example, any country name attributes should be codified to use the International Standards Organization (ISO) country codes. |
| NUMBER | NMBR | A numeric integer used for identification or sequencing and not intended for arithmetic use | 143 | It was noted that number attributes “indicating a measure implied to be in units” need to be changed to the “QTY” classifications. |
| PERCENT | PCT | A part of a whole expressed in hundredths. | 17 | Percent attributes will maintain 5 digits with 2 decimal places |

| Classification | Abbreviation | Classification Description | Number of LDM Attributes | Comments |
|---|---|---|---|---|
| QUANTITY | QTY | A real number indicating a measure implied to be in units and available for arithmetic use | 5 | No changes in indicator general format were recommended. |
| RATE | RATE | A measurement of change over time expressed in designated units of measure | 1 | It was noted that the “Interest_Rate” attribute should be changed to “Interest_Pct.” |
| TIME | TIME | An indication of time of day which is capable of indicating hours, minutes and/or seconds, including fractions | 3 | No changes to the general format were recommended. |

**Exhibit 3-1: Project EASI/ED LDM Classifications**