The Optimal Reference Guide:

IT Defined...
For the Educator, v.2.0

Extraordinary insight into today's education topics

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Introduction

"What this means" goes beyond simple (or not so simple technical) definitions. We need to know the implications, the connections, the relevance of technology terms to our decision making. D3M, data-driven decision making, is handicapped when we don't really understand the vocabulary. For example, in a presentation, the geek says,

> "Authentication is passed along to this Portlet from the Single Sign-On using HTTPS. The User Interface is 508 Compliant to level 1 only in the Presentation Layer, not the query tool."

You, as the decision-maker, need to know just enough to ask if your Special Education staff is upset, your FERPA officer scared, or your IT director concerned. Yes, yes, probably not really. By the way, the FERPA officer is always scared—you knew that.

This glossary document goes right to "what this means." Not what this means to bankers, grocers, physicians, waiters, or sales clerks. What this means to educators, school board members, legislative finance committee members, governors' staff, school advisory group members, and bid selection committees. What this means to the enterprise information system that supports D3M in an education agency. Other dictionaries can give the textbook definition, this one brings it home to the education enterprise.

This glossary includes terms related to the use of data as well as the data themselves. Indicators, scorecards, and other words are rising up in schools, so they need to be part of a technology-use dictionary.

Because we are always adding to our glossary, a current edition will always be available at www.espsg.com/resources.

To see how all these terms fit together in a comprehensive framework for an education agency's data-driven decision making support system, please see our Optimal Reference Guide **"New ESP Framework for Data-Driven Decision Making"** also at www.espsg.com/resources.

508 Compliance

Definition: Standards that allow disabled persons to use software applications.

What This Means: In 1998 the US Congress amended the Rehabilitation Act to require Federal agencies to make their electronic and information technology accessible to people with disabilities. Inaccessible technology interferes with an individual's ability to obtain and use information quickly and easily. Section 508 was enacted to eliminate barriers in information technology, to make available new opportunities for people with disabilities, and to encourage development of technologies that will help achieve these goals. The law applies to all Federal agencies when they develop, procure, maintain, or use electronic and information technology. Under Section 508 (29 U.S.C. § 794d), agencies must give disabled employees and members of the public access to information that is comparable to the access available to others. States which were recipients of Federal funds under the State Technology Act Grant must also comply with the Access Board standards for Electronic and Information Technology.

Actionable Data

Definition: Information that can lead to change.

What This Means: The term actionable data arose because the proliferation of data became overwhelming and the use of data remained low. "Actionable" is earned by data when they inform a decision or action leading to change—or continuation of a successful process. For data to be actionable, they need to be presented in a form that provides the insight a user must have to take action. The term data might better have been indicator or information to emphasize that decision making requires that the data be analyzed and presented to be understandable and interpretable. So, all data are not actionable. (See Max Yield Data.)

Ad Hoc Query

Definition: An *ad hoc* query is an analysis run on-demand because no standard report already exists. *Ad hoc* query may also refer to the unanticipated question for which no ready answer exists.

What This Means: When an action or decision requires data but there is no standard, pre-defined, or existing report available, then special effort is required to generate a custom report. *Ad hoc* queries cause inefficiencies in information systems and organizations. The goal should be to standardize reports as much as practical to avoid *ad hoc* queries. Reporting tools running on a data store or warehouse allow the user to run *ad hoc* queries as long as the data are already in the data store. In some cases the *ad hoc* query tool requires that the data already be calculated into statistics rather than being able to calculate any statistic on demand. (See OLAP.)

API (Application Programming Interface)

Definition: An application programming interface is a language and message format used by an application to call another part of the system into action.

What This Means: Every application does not have to do everything when APIs are used to call upon other programs or the operating system to perform certain tasks. This makes programming more efficient. Writing APIs is a major part of what a programmer does.

Application

Definition: An application refers to a software program.

What This Means: An application automates one or more functions. Examples of an application include a student information system (creating and maintaining student records for enrollment, attendance, grade reporting, etc.), a human resources system (hiring, certifying, and assigning employees), and a financial system (budgeting, purchasing, and inventorying).

Application Layer

Definition: In the Open Systems Interconnection (OSI) communications model that guides software developers and hardware vendors in the design of network communications products, the application layer (the top layer) defines standards for interaction at the user or application program level.

What This Means: The application layer manages formatting electronic mail messages, reading and writing files, and file transfer. It is the highest layer of the protocol stack.

ASP (Application Service Provider)

Definition: An application service provider hosts software applications on its servers at its location. An organization registers to use the application and accesses it over the Internet or a private connection.

What This Means: Instead of paying the expense to buy hardware and software, an organization can "rent" them. Additionally, the vendor will install and maintain the software on its own computers in a secure location. The organization delegates not only that responsibility to the vendor, but also the responsibility to hire and train staff to operate the application.

Assessment

Definition: An assessment is a standardized measure of proficiency, academic success; a test.

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What This Means: The term test has been replaced by assessment to acknowledge that we now measure proficiency and academic success in many different ways. The degree to which an assessment is standardized in its administration, scoring, and interpretation determines its reliability. The validity of an assessment relates to how well the results match the intent and target of what is being measured.

Asynchronous

Definition: Asynchronous describes events that are not coordinated in time.

What This Means: To the user of an information system, this is almost irrelevant. Whether a piece of information travels by its own schedule or in sync with others is for the techies to determine. Some examples of asynchronous communications are exchanging email messages with someone, starting a new task on the computer before the last task has finished running, and using SIF to keep multiple applications up to date. (Contrast with Synchronous.)

Atomic

Definition: Anything atomic is at the lowest or simplest level possible. An atomic operation, or atomicity, implies an operation that must be performed entirely or not at all. For example, if machine failure prevents a transaction to be processed to completion, the system will be rolled back to the start of the transaction.

What This Means: Understanding the atomic operations in an application is important to be able to integrate data exchanges and align operations across applications. This is crucial in today's environments where every application is linked to others in some way.

Authentication

Definition: Authentication is verifying the identity of a user logging onto a network.

What This Means: Any system that contains confidential information has to know who is accessing that system. Authentication is the gatekeeper task. Passwords, digital certificates, smart cards, and biometrics can be used to prove identity.   This is especially difficult in an education setting where principals, superintendents, and staff too often give their sign-ons and passwords to someone else such as assistants, parent volunteers, or even student office aides. (See Authorization for a complementary term.)

Authoritative Data Source

Definition: A data source is authoritative when it is the one all others rely upon for the official data.

What This Means: Designating the authoritative data source is important to ensure an agency knows what data count. Conflicting data from contrasting periodicities, varying definitions, or different people plague agencies that do not designate their authoritative data sources and insist everyone honor them.

Authorization
Definition: Authorization is clearing a person to access a system or information within a system.

What This Means: Once a user has been authenticated, then a software application must determine what level of access that person has. Access can be to everything and every function in an application or a database or it can be very specific to only selected pieces of information. FERPA guidelines are crucial to determining the proper authorization for individuals. For example, a principal may be able to see an assessment report, but small cells may be masked except for the principal's own school.

AYP (Adequate Yearly Progress)
Definition: An accountability measurement defined by the No Child Left Behind Act that requires states to determine how every public school and school district in the country is performing academically in order to identify schools in need of improvement.

What This Means: NCLB is understood by educators. How an individual state implements the AYP process is approved by the USED. The concept behind NCLB is that no individual student should be left behind because the average of all students in a school, district or state is adequate. The most controversial requirement is for all defined subgroups to have 100% of their students at a proficient academic level by 2014.

Back Office
Definition: A back office application does not deal directly with the customer.

What This Means: When you hear "back office," it means that the application is used by the workers, not the decision makers. A data warehouse is a back office application, but the reporting tools used by principals, teachers, or the public are front office.

Batch
Definition: A group of similar items produced, processed, or gathered together and treated as a single unit.

What This Means: Tasks performed by a computer, in which processing-intensive activities are grouped and processed as units, rather than being processed

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immediately on demand. Examples of batch jobs in a PC are a printing request or an analysis of a website log. In larger commercial computers or servers, batch jobs are usually initiated by a system user. Some are defined to run automatically at a certain time.

Beta Testing

Definition: Testing an application in the phase just before it is placed into production.

What This Means: Beta testing is not performed until an application is almost ready to launch. The beta test, coming after the earlier alpha test, may be distinguished from a pilot or field test because the beta test is vetting the application itself more than the processes involved in final implementation.

BI (Business Intelligence)

Definition: Business intelligence encompasses applications and technologies for gathering, providing access to, and analyzing data for the purpose of supporting Data-Driven Decision Making (D3M).

What This Means: The business world has contributed the term "business intelligence" to information technology, but for an education agency, the best term is "data for data-driven decision making."

Blog

Definition: A blog is a web site that contains text entries in reverse chronological order (most recent first) about a particular topic.

What This Means: Blogs serve many purposes from online newsletters to personal journals to "ranting and raving." They can be written by one person or a group of contributors. Entries contain commentary and links to other websites, and images as well as a search facility may also be included. A blog that includes video clips is a "video weblog" or "Vlog." For an education agency, independent blogs can be sources of unofficial information that may contradict official views or statistics. Although some blogs invite feedback and comments from visitors, Internet newsgroup discussions, which started long before the web, tend to be more question-and-answer oriented.

Boolean Data

Definition: Boolean data are values that can be only Yes or No, True or False, or On or Off. Boolean data may be stored as one byte or as little as one bit (1 or 0).

What This Means: Computers use Boolean data, but they run so fast that the inefficiencies of stating everything in sets of Boolean values is offset. Boolean values impact the designers of questionnaires or tests where only right or wrong

answers are desired. But mostly, computer users are far removed from Boolean logic.

Broadband

Definition: Broadband typically means high-speed Internet access via cable or DSL.

What This Means: Speed is everything to schools and other education entities trying to access huge amounts of data or use on-line applications. The T1 is no longer the most affordable fast connection since cable modems provide speeds up to four times that of T1.

Business Continuation Plan

Definition: The business continuation plan specifies how the agency will perform essential tasks after a disaster has disabled its software applications, network, and/or information system.

What This Means: Above and beyond disaster prevention and recovery, the business continuation plan details how tasks such as payroll, grade reporting, instructional management systems, e-mail, and other now-crucial processes will be done while recovery is in process after a disaster. An education agency must know how it will respond to keep student learning going in the aftermath of a disaster. (See our Optimal Reference Guide, **"Disaster Prevention and Recovery for School System Technology"** at www.espsg.com/resources.)

Business Rules

Definition: A business rule is a regulation, policy, or procedure within an organization (or outside sources such as government regulations) that is translated into a software application.

What This Means: Business rules enforce data quality, which is why they are important to education agencies. Business rules are written to check data to ensure they meet the organization's standards. Simple business rules may merely check to ensure a value in a data file is numeric or alphabetic. More extensive business rules verify changes from year to year or relationships between data within a database.

Cable Categories

Definition: The cables (copper or fiber optic) that hard wire computer networks are categorized by the speed and quality of the information they move. Categories (CAT) 1 through 6 are based on the EIA/TIA-568-B standards. Most new wiring for LANs (Local Area Networks) is CAT5e, an improved version of CAT5.

Category Cable Type	Application MHz=bandwidth Mbps/Gbps=maximum data rate

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CAT1	UTP	Analog voice
CAT2	UTP	Digital voice up to 1 Mbps
CAT3	UTP, ScTP, STP	16MHz, 4 Mbps
CAT4	UTP, ScTP, STP	20MHz, 16 Mbps
CAT5	UTP, ScTP, STP	100MHz, 1 Gbps
CAT5e	UTP, ScTP, STP	100MHz, 1 Gbps
CAT6	UTP, ScTP, STP	250MHz, 10 Gbps
CAT7	ScTP, STP	600MHz

Mbps – (Millions of bits per second)
Gbps – (Billions of bits per second)

UTP, STP, ScTP, FTP – Twisted pair cables are available unshielded (UTP) or shielded (STP), with UTP being the most common. STP is used in noisy environments where the shield around each of the wire pairs, plus an overall shield, protects against excessive electromagnetic interference. A variation of STP, known as ScTP for "screened twisted pair" or FTP for "foil twisted pair," uses only the overall shield and provides more protection than UTP, but not as much as STP.

What This Means: Mission-critical networks require CAT5 or better. A professional electrical engineer should specify the category of wiring for any new building.

Cache

Definition: Pronounced "cash," a cache is used to store data temporarily to speed up processing.

What This Means: A large cache allows a computer to move the data needed at the moment out of larger tables and into a temporary area where calculations and other actions can be done faster. Cache capacity can affect performance of software as much or more than other factors. Browser caches and Internet caches store copies of web pages to speed up retrieval the next time the same page is requested.

Certify

Definition: Refers to the confirmation of certain characteristics of an object, person, or organization. This confirmation is often, but not always, provided by some form of external review, education, or assessment.

What This Means: In education we certify data, making sure they meet data quality rules and standards. Data reported to a state or derived for reporting by a state, e.g., AYP, must be certified by the reporting agency to be official.

Change Order

Definition: In project management, a change order is a component of the change management process, whereby changes from the agreed upon scope of the project's work require a mutual agreement.

What This Means: Managing a major project requires juggling the contractual obligations and the practical implementation realities. When these diverge, the change order ensures all parties mutually understand what the new requirements are and how any costs associated with the change are to be covered. Even when dollars are not involved, a formal change order documenting the new deliverables ensures the project management and final product will be acceptable—or at least accepted.

Client/Server

Definition: A computing architecture which separates a client from a server, and is almost always implemented over a computer network. This type of architecture is sometimes referred to as *two-tier*.

What This Means: Client/server configurations devices (and people) to share data, files, and resources. The client is both the end user and the personal computer being used. The server is the centrally located computer managing the application. This configuration is significant because it does not require the user (i.e., a principal or teacher) to manage the administration and hosting of the more complex application—merely to sign onto the server and work.

Community of Interest

Definition: A community of interest is a group of people with a common issue, job, or interest.

What This Means: Communities of interest have been created to share tacit knowledge that otherwise would never be documented and known by other users. High school registrars form a community of interest to share shortcuts, controls, and contact information when sending electronic student records and transcripts.

Confidentiality

Definition: Confidentiality refers to the obligation not to disclose or transmit information to unauthorized parties. In technology, this refers to a designation of the security classification below secret.

What This Means: In education, confidentiality is especially important with regard to individually identifiable student information, which must be maintained confidential according to the Federal Education Right and Privacy Act (FERPA). Education organizations must have policies and procedures that ensure that no one has unauthorized access to confidential student data.

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COTS (Commercial Off-the-Shelf)
Definition: COTS refers to ready-made merchandise that is available for sale.

What This Means: This term is used to describe software and hardware products. A COTS product is often used as an alternative to a product that is developed in-house. The motivation for using COTS components is that they will reduce overall system development costs and involve less development time because the components can be bought instead of being developed from scratch. (See MOTS.)

CRM (Customer Relationship Management)
Definition: A term representing the business strategy built around the concept of improved customer service. The CRM definition involves all aspects of communications an organization has with its clients.

What This Means: Typically this term refers to a software application used to manage relationships with customers. Each interaction (phone conversation, marketing campaign, etc.) with a customer is generally added to a customer's contact history and staff can retrieve information on customers from the database as necessary.

Crosswalk
Definition: Crosswalks establish how values in one system are transformed into values in another system.

What This Means: The last name, first name, middle initial, birth date, and gender fields as defined in one application's database must be crosswalked to the first name, middle name, last name, gender, date of birth fields in another when data are shared. Legacy systems are seldom changed to match a new data format. Instead a crosswalk table is built to change the legacy system's layout around to match the new format.

CSV (Comma Separated Value)
Definition: CSV or comma-separated values (or comma delimited) describes a data file in which there is a comma between two pieces of data to allow applications to read the information correctly.

What This Means: This is one of the most significant aspects of managing education data. Spreadsheets, student information system applications, and most other software packages can produce these simple CSV files as the most expedient way to exchange data. CSV files can also be read by the human eye—an advantage over EDI, XML, and other formats. However, continued reliance upon CSV files for exchanging education data is holding back progress in many agencies. Software vendors and education agencies should be transitioning to more interoperable standards such as XML (SIF).

D3M (Data-Driven Decision Making)

Definition: When a decision is based upon supportive data rather than opinion or personal experience.

What This Means: Decision makers can be anyone in the education arena—parents, taxpayers, teachers, policy makers, legislators, etc. When one of the stakeholders must make a choice, having supportive data to point to is comforting and politically safe. (See our Optimal Reference Guide, **"D3M Framework for Building a Longitudinal Data System"** at www.espsg.com\resources.)

D3M Framework

Definition: The D3M Framework is ESP's definition of the components and their relationships as required for an education enterprise information system, or, to use NCES's terminology, a longitudinal data system.

What This Means: The D3M Framework provides a comprehensive, high-level picture of the components needed by an education agency to support data-driven decision making. (See our Optimal Reference Guide, **"D3M Framework for Building a Longitudinal Data System"** at www.espsg.com\resources.)

Dashboard

Definition: An online tool for graphically displaying a complex sets of indicators.

What This Means: Educators, administrators, parents, and others can use dashboards to get a quick overall picture of student data. Dashboard seems to be an archaic, limited analogy for the rich, analytical nature educators seek in an indicator system. (See Scorecard for a more illustrative term.)

Data Architecture

Definition: Data architecture describes how data are processed, stored, and utilized.

What This Means: An education agency must have a clear data architecture to manage the flow of data in and across all information systems.

Database

Definition: A database is a data store that provides a means for updating, expanding, deleting, and accessing the data.

What This Means: Any software application keeps its data in a database. However, see the definition of data store to understand how many different ways databases are named.

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Data Dictionary

Definition: As defined in the *IBM Dictionary of Computing,* a data dictionary is a "centralized repository of information about data such as meaning, relationships to other data, origin, usage, and format."

What This Means: To the educator, the data dictionary is the authoritative course for definitions, codes, and interpretations for all data elements and derived statistics for an education agency. At this level, the term metadata dictionary is appropriate. For the IT professional, the data dictionary is more technical, describing the tables, fields, and codes around which a database is designed and constructed.

Data Management

Definition: Data management includes all of the policies and processes related to defining, collecting, storing, and reporting data.

What This Means: An education agency that delegates all data management to the IT staff may lose the full benefits of the data, encounter policy conflicts when people use the data, or experience burden that interferes with the willing reporting of data. (See Max Yield Data.) An overall data management plan or information systems architecture should be developed and maintained with the participation of all stakeholders.

Data Model

Definition: The data model describes the design and organization of a database. The data model is often represented in an entity relationship diagram.

What This Means: A data model designed specifically for an education agency is a critical success factor in the implementation of a data warehouse. Education data are different and more complex than most business data. For an education database to be efficient, it must be built upon an appropriate data model.

Data Quality

Definition: Quality of data is defined by the match between the data and their acceptability for their intended purpose.

What This Means: To achieve data quality, an education agency must have metadata standards, quality assurance processes, and a high level of use of the data to ensure that everyone who touches the data has a stake in their quality. ESP's Hierarchy of Data Quality is part of the U.S. Department of Education's National Education Technology Plan. (See our Optimal Reference Guides, **"The Data Quality Imperative, Data Quality Series Part I"** and **"The Data Quality Manual, Data Quality Series Part II"** at www.espsg.com/resources.)

Data Quality Rules

Definition: Data quality rules are applied to data to maintain data consistency, formatting, and fidelity to mandated definitions.

What This Means: The only difference between business rules and Data Quality Rules is the emphasis in the first case on accuracy and in the second case on validity for use.

Data Steward

Definition: The data steward is responsible for the quality of the data in a designated application or database.

What This Means: The designation of data stewards by an agency ensures that someone is taking responsibility for the data, i.e., definitions, user compliance, completeness, access, etc. The data steward needs to be more of a content or education program expert than a Database Administrator; although, the data steward could be both.

Data Store, Database, Data Warehouse, Data Mart, Analysis Database

Definition: All these terms describe a place where data are consolidated to make using them more efficient.

What This Means: Regardless of the term used, the data are organized into related tables or hierarchical files for easy access. An education agency may have several of these depending upon how data are managed. The key is to know where the data are and how they are defined. *Please note*—a data store does not encompass the reporting tools that allow someone to use the data. Some data warehouses are sold with their reporting tools.

DBA (Database Administrator)

Definition: The person responsible for the physical design and management of a database and for the database management system (DBMS) that manages it.

What This Means: Be very nice to the DBA. This is the person who ensures that the database and the data inside are always working, efficient, and available. The DBA's advice is crucial to any decisions related to other applications that use the data.

DBMS (Database Management System)

Definition: The database management system controls the organization, storage, retrieval, security, and integrity of data in a database.

What This Means: The database management system is the key to the administration and use of a data store. The major DBMS vendors are Oracle, IBM

(DB2), Microsoft SQL Server), and Sybase (ASE). MySQL is a very popular open-source product.

Disaster Prevention and Recovery
Definition: The disaster prevention and recovery plan details how technology services will be re built or repaired after a disaster.

What This Means: Technology and information systems can be recovered or even made redundant such that they can be replaced or rebuilt quickly after a disaster. The real disaster from a storm, fire, or other catastrophic event is the loss of instructional time by students.   An agency's plan must go far beyond a hot back-up site. (See our Optimal Reference Guide, **"Disaster Prevention and Recovery for School System Technology"** at www.espsg.com/resources.)

Download
Definition: Receiving data from a remote or central system, such as a web server, FTP server, mail server, or other similar systems.

What This Means: When data are in one place and need to be moved to another, a download occurs. Don't worry about "down." Upload means the same if you are sending your data rather than getting someone else's data.

EDEN (Education Data Exchange Network)/EDFacts
Definition: EDEN is a centralized repository of data from State Education Agencies. ED*Facts* is an initiative of the U.S. Department of Education and states to use the data in EDEN not for compliance, but to focus on education outcomes.

What This Means: EDEN collects data required for Federal reports such as the Consolidated State Performance Report, Special Education reports, Safe and Drug Free Schools reports, and the NCES Common Core of Data.

EDI (Electronic Data Interchange)
Definition: Electronic data interchange is a standard format for exchanging business data.

What This Means: In the early 1990's, the SPEEDE/ExPRESS format for student transcripts was developed using EDI standards. To exchange data using the SPEEDE/ExPRESS format, an education organization had to have established trading partnerships with other education organizations. While many postsecondary institutions have implemented SPEEDE/ExPRESS, few elementary/secondary organizations have done so. Newer formats for student transcripts use XML and promise to be more user-friendly for PK-12 education organizations.

Enterprise

Definition: An enterprise is a company, business, organization, or other purposeful endeavor.

What This Means: When planning for technology, it is important to consider the needs of the entire enterprise rather than just a portion. Within a school district, technology is used both for administrative purposes in school and district offices and for instruction in schools. (See ERP (Enterprise Resource Planning.)

Entity Relationship Diagram

Definition: A diagram that describes what is inside the database and how each part relates to all others.

What This Means: When the time comes to produce reports or to perform a query, the data must be arranged in the database such that they can be accessed and related to each other appropriately. In the software developers' quest to be efficient, the relationships among the entities within a database document how to get to everything after redundancy is reduced.

Environment

Definition: Environment is simply the layout, context, and configuration of all the IT resources.

What This Means: When someone refers to the environment, this means any and all of the components that make up the total information system. IT people typically think of several key characteristics of their environment. These include: network topology, operating systems, hardware platform, security, etc.

ERP (Enterprise Resource Planning)

Definition: ERP results in an integrated information system that serves all departments within an enterprise. Evolving out of the manufacturing industry, ERP implies the use of packaged software rather than proprietary software written by or for one customer. ERP modules may be able to interface with an organization's own software with varying degrees of effort, and, depending on the software, ERP modules may be alterable via the vendor's proprietary tools as well as proprietary or standard programming languages.

An ERP system can include software for manufacturing, order entry, accounts receivable and payable, general ledger, purchasing, warehousing, transportation and human resources. The major ERP vendors are SAP, PeopleSoft, Oracle, Baan and J.D. Edwards. Lawson Software specializes in back-end processing that integrates with another vendor's manufacturing system.

What This Means: It is important to make technology purchases that fit the ERP to ensure technology is interoperable and benefits all relevant users within the education organization.

ETL (Extract, Transform, Load)
Definition: ETL is the process of pulling data from one application, formatting them as needed, and putting them into the target application.

What This Means: Data are kept in different ways inside various software applications. When we must move the data from one to another, we have to reformat and at times, change codes to match what the target application wants. ETL is how this is done.

Extensibility
Definition: In software engineering, extensibility is a system design principle where the implementation takes into consideration future growth. It is a systemic measure of the ability to extend a system and the level of effort required to implement the extension.

What This Means: Extensibility is your insurance that an application will not be limited to only today's functionality or interoperability with other applications. Newer applications are not necessarily more extensible—it's all in their architecture.

Fail Over
Definition: Fail over is a term for redundancy that allows a system to continue running when there is a failure of a key component.

What This Means: Fail over systems automatically keep things running when a system failure would otherwise bring down an application or service. A teacher's class taking an on-line benchmark assessment would not notice a server crash if the failover system performs adequately.

FERPA
Definition: Family Education Rights and Privacy Act

What This Means: FERPA mandates how personally identifiable must be protected by an education agency. (See our Optimal Reference Guide, **"FERPA: Catch 1 through 22"** at www.espsg.com/resources.)

Filter
Definition: A filter is a set of criteria established to select desired data.

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What This Means: Often a filter is set up when a report is being run to include only those individuals desired. For example, a filter may select only students on the free-lunch program with greater than five absences.

Firewall

Definition: A software application that allows only authorized users through and blocks all others.

What This Means: A firewall keeps a computer, and the data on it, secure from intruders. Firewalls may provide a first line of defense against unauthorized access to data and systems; however, an education agency must take additional steps to ensure that those users who pass through the firewall are allowed access only to authorized data as per FERPA and local policy. (See Proxy Server.)

Front-End Processor

Definition: A front-end processor is a computer that handles communications processing for a mainframe. It connects to the communications lines on one end and the mainframe on the other. It transmits and receives messages, assembles and disassembles packets, and detects and corrects errors.

What This Means: A computer that used to process data before it is sent to a mainframe computer for analysis or further processing.

Fuzzy Logic

Definition: Fuzzy Logic was created to manage imprecise data and solve problems that have many solutions rather than one. Fuzzy logic was conceived by Lotfi Zadeh, former chairman of the electrical engineering and computer science department at the University of California at Berkeley. In 1964, while contemplating how computers could be programmed for handwriting recognition, Zadeh expanded on traditional set theory by making membership in a set a matter of degree rather than a yes-no situation.

What This Means: The terms may be used more in the future as actionable reports are created from analyzing conditions that exist in schools or with individual students. Fuzzy logic works in digital computers which make only yes-no decisions (see Boolean Data), but solves problems in a way that resembles human logic.

GPS (Global Positioning System)

Definition: A Global Positioning System is a satellite-based radio navigation system run by the U.S. Department of Defense.

What This Means: Signals from at least four satellites on the horizon at all times are sufficient to compute the current latitude, longitude, and elevation of a GPS receiver anywhere on earth to within a few meters. GPS coordinates are used to

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locate school buildings and other facilities for emergency plans. Bus routes, school boundaries, and geography lessons use GPS data.

Growth Model
Definition: A growth model measures change in student academic performance rather than status.

What This Means: When NCLB mandated a status standard for AYP and described only quasi-longitudinal growth as an alternate indicator, failing schools that seemed to be improving but not reaching the annual objective for AYP sought recognition for growth in student performance. USED now allows states to use a growth model under specific guidelines if acceptable growth is great enough to move students toward proficiency by the end of a school's grade span. States have also embraced growth models irrespective of NCLB acceptance.

The essence of a growth model is that it detects whether or not a student's assessment scores from one year to another are improving that student's proficiency level. Some growth models project a student's longitudinal trend on an assessment to estimate whether or not the student will be proficient by a target grade level. How much growth is enough is a significant decision for any growth model. (See Value-Added Model.)

Hot Back-Up Site
Definition: A hot back-up site provides all the major services of an agency's primary IT infrastructure in the event the primary site crashes or is taken out of service.

What This Means: The hot back-up site is essential for those services that an agency cannot afford to lose for an extended period of time.

HTML (HyperText Markup Language)
Definition: HTML defines the page layout, fonts, and graphic elements as well as the hypertext links to other documents on the Web.

What This Means: HTML is not a programming language. However, the complexity of an education agency's web pages demands complex HTML to produce the graphics and links demanded.

HTTP (Hypertext Transfer Protocol)
Definition: Hyper Text Transfer Protocol is the protocol used most commonly to transfer web pages and accompanying data over the Internet.

What This Means: HTTP is the engine of the World Wide Web that allows separate documents to be quickly accessed.

HTTPS (Hypertext Transfer Protocol Secure)

Definition: Hyper Text Transfer Protocol that provides security to protect data and identities.

What This Means: A secure HTTP engine is referred to as HTTPS. Education agencies insist on HTTPS to protect their data from unauthorized access.

Identity Management

Definition: Identity Management allows an organization to maintain the authentication and authorization information on users, their roles, and group memberships.

What This Means: Well beyond the annual staff directory, identity management must define for each individual precisely what that person can access within an education agency's information system.

Index

Definition: An index combines metrics and indicators into a high-level measure.

What This Means: AYP is an index combining annual objectives, participation rates, and alternative indicators. The advantage of an index is that the decision maker is using fewer measures which have already been combined and weighted to represent the agency's goals. (See our Optimal Reference Guide, **"From Information to Insight - the point of indicators"** at www.espsg.com/resources.)

Indicator

Definition: An indicator is a statistic that is calculated and reported to measure a useful condition or status.

What This Means: Indicators are also called metrics or analytics. They are used to provide guidance to answer a key policy question or make some other data-driven decision. Adequate Yearly Progress, dropout rate, and average daily attendance are indicators. The goal within an education environment is to find those indicators that lead to actions. (See our Optimal Reference Guide, **"From Information to Insight - the point of indicators"** at www.espsg.com/resources.)

Infrastructure

Definition: The basic underlying framework and components of an education agency's information system is the infrastructure.

What This Means: The infrastructure needs to be up-to-date, robust, and well-maintained or the more evident technology features such as software applications

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and web sites will not function well. An education agency's infrastructure includes the network, systems hardware components, operating systems, database management system (DBMS), enterprise software applications, and information systems architecture.

Integrated Notification System

Definition: When something happens of significance, the Integrated Notification System alerts the appropriate person.

What This Means: Applications with an integrated notification system ensure that important events, changes, or problems get immediate attention. Notification can be by e-mail, posting of a message on a portal, etc.

Internet2

Definition: Internet2 is the second generation of the Internet, developed by a consortium of more than 200 universities, private companies, and the U.S. government. Internet2 is designed for full-motion video and 3D animations—for research purposes (for now).

What This Means: Clearly (some) schools (already) use video and animations extensively. The interest in and demand for Internet2 functionality will rise but may be momentarily tempered by the speed and capacity of schools' Internet access.

Interoperability

Definition: Information systems are interoperable when they can share data—without re-keying those data.

What This Means: Interoperability means that the burden of entering data is experienced only once. To be truly interoperable, systems must share common data definitions, the same codes or have a crosswalk for the codes, and be physically linked together (that is by fiber, wire, wireless, Internet).

ISA (Information Systems Architecture)

Definition: The Information Systems Architecture answers the question "Is the decision I'm about to make consistent with the policies, procedures, and standards adopted by our agency?"

What This Means: The ISA is a hybrid technical, policy, and budgeting guide. The ISA does not contain all the details of an agency's hardware, software, and network architecture, but establishes the standards to which those detailed requirements, specifications, and documentation must be held. The ISA is the first foundational component for any agency's information system. The ISA must be maintained to be current as standards, policies, and practices change over time. (See our Optimal

Reference Guide, **"D3M Framework for Building a Longitudinal Data System"** at www.espsg.com\resources.)

ISDN (Integrated Services Digital Network)

Definition: Integrated Services Digital Network is an international standard for switched, digital dial-up telephone service for voice and data.

What This Means: Analog telephones and fax machines that are used over ISDN lines have their signals converted into digital by the ISDN terminal adapter. ISDN enjoyed a surge of growth in the early days of the Internet because it provided the only higher speed alternative to analog modems in many areas. Still working in many behind-the-scenes applications, ISDN is rarely used for Internet access.

ISO 9000

Definition: ISO 9000 is a family of standards and guidelines for quality in the manufacturing and service industries from the International Organization for Standardization (ISO). ISO 9000 defines the criteria for what should be measured. ISO 9001 covers design and development. ISO 9002 covers production, installation, and service. ISO 9003 covers final testing and inspection.

What This Means: ISO 9000 certification does not guarantee product quality. It ensures that the processes which are used to develop the product are documented and performed in a quality manner.

Java

Definition: Java is an object-oriented programming language that is platform independent (the same Java program runs on all hardware platforms without modification).

What This Means: Java embodies the "write once-run anywhere" model, which has been one of the Holy Grails of computing for decades. Developed by Sun, Java is widely used on the Web for both client and server processing. Modeled after C++, Java tightened up much of the syntax and added features to reduce and isolate programmer errors. It was also designed to run in small amounts of memory.

JDBC (Java Database Connectivity)

Definition: The JDBC application programming interface can access any kind of tabular data, especially data stored in a relational database.

What This Means: JDBC helps write java applications that manage these three programming activities:

- Connect to a data source, like a database
- Send queries and update statements to the database

- Retrieve and process the results received from the database in answer to your query

Knowledge Management

Definition: Knowledge management is a general term for how an organization makes more efficient use of the human knowledge that exists within the organization. Knowledge management brings both explicit and tacit wisdom employees have into a system where anyone can share previously written or unwritten information and insights.

What This Means: Knowledge management identifies and gathers content from documents, reports, and other sources to be searchable for meaningful relationships. Beyond that, knowledge management brings to light the tacit or informal understanding people have of how everything works.

KPI (Key Performance Indicator)

Definition: Key performance indicators are those metrics by which we judge the effectiveness and success of both processes and outcomes.

What This Means: Adding the word "key" to this term emphasizes the importance of the indicator. Some education agencies use school improvement methodologies that refer to their main indicators as KPIs.

Lagging Indicator

Definition: A lagging indicator is a measure of an outcome.

What This Means: Lagging indicators come at the end of a process or program to measure success. They are also known as trailing indicators. A lagging indicator may be used as a leading indicator in an historical or longitudinal analysis.

LAN (Local Area Network)

Definition: A communications network that serves users within a confined geographical area.

What This Means: A LAN could connect users within a single school or within a school system's central office. LANs provide more security than a broader network across locations might.

LDAP (Lightweight Directory Access Protocol)

Definition: LDAP is a process used to access a directory listing.

What This Means: LDAP provides a common method for searching information in a directory. LDAP is a companion protocol to HTTP and FTP. An agency-wide LDAP

implementation can enable almost any application, running on almost any computer platform, to obtain information from your LDAP directory. And that directory can be used to store a broad range of data: email address and mail routing information, HR data, public security keys, contact lists, etc. By making an LDAP directory a focal point in your systems integration, you're providing one-stop shopping whenever people go looking for information within your company—even if the primary source of the data lives elsewhere.

Leading Indicator

Definition: An indicator that is predictive of an outcome.

What This Means: A leading indicator is a measure that is made at a time when changes can still be made in a process or program to improve outcomes. Identifying leading indicators in education is challenging because we measure more outcomes (See Lagging Indicator and Trailing Indicator). Some potential leading indicators are benchmark assessment results, weekly attendance rates, monthly discipline incidents, and report card grades. Lagging or trailing indicators may also be used as leading indicators in an historical or longitudinal analysis.

Legacy System

Definition: A legacy system is a computer system that has been in existence for a number of years. Often this system is a mainframe system that does not take advantage of new technologies such as client/server.

What This Means: Many education organizations have legacy computer systems that no longer provide the capacity needed for interoperability, multitasking, data-driven decision making and other capacities now considered essential. Moving from a legacy system to a state-of-the-art system often requires many dollars, much staff time, staff development, parallel systems, and other seemingly unconquerable issues to arrive at a more useful and friendly system.

Level 1, 2, 3 Business Rules

Definition: Business rule levels are defined by the breadth of the characteristics that must be checked. Level 1 rules are simple ones that can be verified using only readily available data; whereas, level 3 rules may require referencing data from across the entire agency.

What This Means: Most applications check level 1 rules whenever data are entered. The highest degree of enforcement of data quality requires that the relationship of a datum be checked against other data. For example, when a new student enrolls in a school, a level 1 business rule might be to check that all the required information fields are filled in, e.g., name, date of birth, etc. A level 3 business rule might be to check whether the student was a former student who had been previously reported as a dropout.

After searching the Internet, level 1, 2, and 3 business rules can be defined freely. The notion of levels is very esoteric—merely indicating a level of complexity. So, has

anyone found a definitive definition of levels for business rules? Until then, let's use these.

>Level 1: a rule that describes characteristics of and relationships across data within a single record

>Level 2: a rule that describes characteristics of and relationships across data within a single data set

>Level 3: a rule that describes characteristics of and relationships across data among multiple data sets. What distinguishes Level 3 rules is that they cannot be tested using only data within a single data set.

There is some definitional confusion about using other tables to test rules, e.g., identifiers, school codes, etc. Within each level are rules that are categorized as:

>Look Up: Another table is referenced.
>Historical: A series of past values is compared.
>Projected: A value is compared based upon a projection of the value expected.

These rules are not Level 3 necessarily because the look-up table, historical values, or projected value can be readily available to test the rule without reliance upon other data sets being available.

Longitudinal Data
Definition: Longitudinal data represent more than one point in time about an individual, program, or organization.

What This Means: In education, decision makers want to consider not just the status of a school, program, or student, but also the trend. Making progress is valued as well as current high performance. Information systems are being re-engineered to hold data across time and run analyses of trends. A common perspective is to think in terms of annual measures. However, decisions may best be driven by much shorter periodicities.

Mainframe
Definition: Mainframe computers are enterprise-level machines that can manage multiple, large-scale processes simultaneously.

What This Means: Mainframe computers in education agencies have largely been replaced by servers, typically multiple servers, for flexibility, cost savings, and software application operating system requirements. Mainframes continue to have viability for certain large installations. Determining whether a mainframe or a series of servers meets an agency's needs is a complex technical decision. Today, many, if not most software applications for schools and education agencies are architected to run on servers.

Max Yield Data

Definition: Max Yield Data are those data that everyone agrees are worth the effort required to collect, clean, and report them.

What This Means: Data reporting burden and information overload are symptoms of today's explosion in the data we have available to us. Now it's time to be more selective in what we require schools to report and what we generate in reports. Finding and focusing on actionable data, mandated reports, and the data that actually drives decision making will result in max yield data.

Metadata

Definition: Data about data, metadata are used to facilitate the understanding, characteristics, use, and management of data.

What This Means: Every education agency must have control over its metadata. Metadata standards are part of a comprehensive Information Systems Architecture. Metadata are the authority for how data elements are defined, reported, and stored across all information systems. Metadata are the single most important part of reducing reporting burden from schools to districts to states. Consistent compliance with metadata standards negates the necessity for crosswalks and other burdensome processes to share the data across individual systems

MHz (MegaHertz)

Definition: One million cycles per second equals one megahertz. MHz is the unit used to measure the transmission speed of electronic devices, including networks. One-gigahertz means one billion times per second.

What This Means: The more MHz, the faster something exchanges information. As software applications get more complex and data grow, large increases in MHz are required to achieve even small, noticeable improvements in performance of computers and applications.

MOTS (Modified Off-the-Shelf)

Definition: A product that is a COTS (Commercial off-the-shelf) product whose source code can be modified. The product may be customized by the purchaser, by the vendor, or by another party to meet the requirements of the customer.

What This Means: Education organizations often want products that meet certain specific requirements not covered by existing COTS products. As a result, they may want to purchase a MOTS product.

NCLB (No Child Left Behind Act)

Definition: Federal legislation aiming to improve the performance of U.S. primary and secondary schools by increasing the standards of accountability for states, school districts, and schools, as well as providing parents more flexibility in choosing which schools their children will attend.

What This Means: NCLB is the source for many of the data collection and reporting mandates for schools, districts, and states. Complying with NCLB has motivated states to upgrade their information systems to be more flexible and based upon individual records rather than pre-calculated, aggregate statistics.

Network Topology

Definition: A network topology refers to the physical configuration of cables, computers, and other peripherals.

What This Means: An education organization should have a network topology to ensure that any new equipment will work with existing equipment and be able to exchange data as needed.

NRP (Network Resource Planning)

Definition: NRP is the planning, scheduling, and control of a computer network.

What This Means: NRP includes all the planning and design necessary to ensure a network works as required. NRP includes documentation writing and network diagramming, analyses of traffic and congestion, analyses of application behavior and demand, procedures for failsafe and disaster recovery operation, and forecasting requirements and redesign.

ODBC (Open Database Connectivity)

Definition: ODBC is a database programming interface from Microsoft that provides a common language for Windows applications to access databases on a network.

What This Means: For client/server database systems such as Oracle and SQL Server, the ODBC driver provides links to their database engines to access the database. For desktop database systems such as Access and FoxPro, the ODBC drivers actually manipulate the data. ODBC supports SQL and non-SQL databases. Although the application always uses SQL to communicate with ODBC, ODBC will communicate with non-SQL databases in its native language.

ODS (Operational Data Store)

Definition: A database designed to integrate data from multiple sources to make analysis and reporting easier. Because the data originates from multiple sources, the

integration often involves cleaning, resolving redundancy, and checking against business rules for integrity.

What This Means: The ODS makes that important step to bring data from various sources together. The ODS relies upon the metadata standards to ensure the data are compatible and understood.

Official Data

Definition: Data become official when an agency certifies them for public reporting and uses them for their official purposes.

What This Means: Education agencies are required to report certain data and choose to report others. Because today's information systems facilitate the calculation of interim statistics, leading indicators, research findings, and query results, the necessity for an agency to certify the data and statistics that are considered to be final, accurate, and usable for comparison has increased. Every board member, legislator, superintendent, and other official wants the assurance that when they cite a statistic that it is the real one.

OLAP (Online Analytical Processing)

Definition: OLAP is a category of software tools that provides analysis of data stored in a database. OLAP tools enable users to analyze different dimensions of multidimensional data.

What This Means: OLAP enables end-users to perform *ad hoc* analysis of data in multiple dimensions, thereby providing the insight and understanding they need for better decision making.

Open Architecture

Definition: A type of computer or software architecture that allows adding, upgrading, and swapping components.

What This Means: With full knowledge that claims to be open architecture vary in their accuracy, the advantage of an open architecture is that an agency has at least the possibility that they will not be tied to a single vendor in the future for changes, upgrades, enhancements, and access to their own data.

Open Source

Definition: Software in which the source code is openly available.

What This Means: There is often no cost for use of open source applications; however, some companies offer value added support at a fee that is typically less than the license for a commercial product.

Open Standards

Definition: Open standards are those specifications for hardware or software that are developed by a standards organization or a consortium involved in supporting a standard and which anyone can adopt or use.

What This Means: Open standards are available to anyone. Complying with open standards implies that an existing component in a system or a product can be replaced with one from another vendor. Education agencies conforming to open standards have alternative commercial sources for products that are compatible with any other products complying with the same standards. This can save significant initial procurement or replacement costs.

A proprietary standard has been developed by a single vendor who controls the use of that standard. Products using proprietary standards typically do not work with or exchange data easily with open standards or other proprietary standards.

OS (Operating System)

Definition: The operating system is the master program that runs the computer, sets the standard for all applications that run on the computer, manages all files, and displays the user interface.

What This Means: The operating system determines which software applications will run on a computer. Examples are DOS, Windows (95, 98, NT, ME, 2000, XP), Macintosh OS X, Linux, and Unix (Solaris, AIX, HP-UX, etc.), OS/400 (IBM iSeries), and z/OS (IBM zSeries mainframes). When an education agency had only a few computers, a single operating system was typically chosen. Today, an agency can have many computers running multiple operating systems to match the individual applications each is supporting.

Packets

Definition: A formatted block of data.

What This Means: This is something hidden from the user and of interest to the technical professionals. For the educator, packets simply mean that the full set of data being exchanged is broken up when sent and reassembled when received. A single packet, if intercepted, is not likely to contain usable data.

Periodicity

Definition: The schedule on which data are collected or reported.

What This Means: Periodicity is important because it defines when data must be collected and when data will be reported. Combine this concept with official data and an agency has a calendar of when its official statistics will be reported. Another

aspect of periodicity is defining the timeframe or point in time represented by the data, e.g., from April 3 through May 14, as of October 1, quarterly, etc.

PESC (Postsecondary Electronic Standards Council)

Definition: The Postsecondary Electronic Standards Council is a voluntary membership organization that develops standards for exchanging higher education data.

What This Means: PESC has developed an XML format for exchanging high school transcripts.

Pilot Program

Definition: A pilot program is a test run of a software application before full implementation.

What This Means: Pilot programs take many forms. Some use volunteers, some carefully select a representative sample of users to ensure all possible issues are identified. A pilot should come after all beta testing and QA processes are complete.

Platform

Definition: The platform includes the operating system or software tool set upon which an application runs or was developed.

What This Means: Platform is significant because it determines and limits the compatibility of hardware or software with others. Education agencies at times narrowly define the platforms they will use to simplify procurement, implementation, maintenance, and staffing.

Platform Dependent

Definition: Platform dependent means that an application runs under only one operating system and runs in only one series of computers (one operating environment).

What This Means: If you buy a platform dependent application, you have to have or buy the computer and or operating system it runs on. In contrast, a platform independent application can run in different operating environments.

Politimetrics

Definition: Politimetrics is both the cause and the result of a political decision about the appropriate psychometrics to use when establishing cutpoints and other criteria for success.

What This Means: Most decisions about where to set the score for proficiency, how many credits to require for graduation, or what score qualifies a student to enroll in a special program are made through a combination of science (psychometrics) and policy (politics). Neither the pure psychometricians nor the pure politicians should make those decisions independent of the data and wisdom of the other.

Portal
Definition: A portal is a web "supersite" that provides a variety of services including web search, news, e-mail, discussion groups, and links to other sites.

What This Means: Every education agency is likely to have a portal to manage communications and access with their tremendously varied user community.

Portlet
Definition: A portlet is an application or site that is accessible through a portal's user interface.

What This Means: Portals manage a user's experience with an agency's information. Instead of sending the user off to another web site, a portal can open a portlet which provides a specific function. The portlet can even be a full-screen application that is integrated with single sign-on.

Post
Definition: Publishing data to a web site is posting them.

What This Means: We used to say disseminate, distribute, pass out, send, mail, etc. Now, with web sites, blogs, and other electronic media, the word most often used is "post".

Presentation Layer
Definition: The second highest layer (layer 6) in the OSI seven layer model is the presentation layer. It performs functions such as text compression, code or format conversion to try to smooth out differences between hosts. It allows incompatible processes in the application layer to communicate via the session layer.

What This Means: The presentation layer is the first one where people start to care about what they are sending at a more advanced level than just a bunch of ones and zeros. This layer deals with issues like how strings are represented. The idea is that the application layer should be able to point at the data to be moved, and the presentation layer will deal with the rest.

Protocol

Definition: A protocol is a set of rules for formatting messages sent between computers.

What This Means: Protocol is simply a standard way to do something. In the computer world, everything has to be standardized so the machines do not have to think about the data before performing the expected action with them.

Proxy Server

Definition: A proxy server acts as a relay between two networks.

What This Means: This server acts as an intermediary between a workstation user and the Internet to ensure security, administrative control, and caching service.

Pull Technology

Definition: Pull technology requires the user to ask for something by performing a search or requesting an existing report, video, or other data type.

What This Means: When using pull technology, the user must ask it perform an action to get the desired results. Web pages use pull technology – the user must initiate the interaction. (Contrast with Push Technology.)

Push Technology

Definition: Push technology delivers data automatically into the user's computer at prescribed intervals or based on some event that occurs.

What This Means: When using push technology, the user does not need to do anything to get data. The choice of whether to use push or pull technology is dependent upon the workflow for a given task. E-mail is an example of a push technology – it is delivered to the user automatically. (Contrast with Pull Technology.)

QA (Quality Assurance)

Definition: Quality assurance is a process, procedure, or program that tests hardware or software to ensure that all products and systems perform as originally specified.

What This Means: Quality assurance processes have grown in importance to ensure software applications work before they are launched. QA cannot be left up to the developers of an application. Independent QA is necessary.

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QPM (Quality Project Management)

Definition: A term used by ESP to describe their project management methodology.

What This Means: Education agencies require customized project management approaches. ESP has adapted the Project Management Institute's methodology and enhanced it for the education information arena. (See our Optimal Reference Guide, **"Why 70 Percent of Government IT Projects Fail, Project Management Series Part I"** at www.espsg.com/resources.)

Query

Definition: A query is a custom report generated by a statement (question) posed to a database.

What This Means: Standard reports are somebody else's idea of what's important to know. A query is your own idea of a report you want. Reporting applications have user interfaces for composing a query that typically allows the user to select available measures or "facts" and designate the breakouts/disaggregations or "dimensions" of interest.

RAID (Redundant Array of Independent Disks)

Definition: A redundant array of independent disks uses more than one disk drive to back up data or enhance performance.

What This Means: Instead of having to copy data onto another computer or tapes for back up, RAID performs back ups in real time. The redundant disks also allow applications to keep running even if one of the disk drives fails.

Real Time

Definition: Real time is a level of computer responsiveness that a user senses as sufficiently immediate or that enables the computer to keep up with some external process (for example, to present visualizations of the weather as it constantly changes). Real-time is an adjective pertaining to computers or processes that operate in real time.

What This Means: Real time describes a human rather than a machine sense of time. When an application performs its work in real time, it is keeping its database up to date as each transaction or entry is made. Real time is important for applications that must provide immediate reports or when data entered into one application must be shared instantaneously with other applications.

Relational Database/RDS (Relational Data Store)

Definition: A relationship database is a database that has separate files (tables), but each is related to others.

What This Means: Relational databases allow queries and reports to run faster. The concept was developed in 1970 by Edgar Codd, whose objective was to accommodate a user's *ad hoc* request for selected data. Almost all database management systems (DBMS), including Oracle, DB2, SQL Server, MySQL, etc., are relational.

Reliability

Definition: The probability that a system, including all hardware, firmware (code that manages individual hardware components), and software will satisfactorily perform the task for which it was designed or intended, for a specified time, and in a specified environment.

What This Means: If a solution is found reliable that means the components (normally refers to hardware components) that make up that solution can be expected to perform for the duration needed in order for the solution to be successful. This is often achieved through hardware redundancy (See system redundancy).

The No Child Left Behind Act advanced the use of reliability rules for determining the number of students in a category needed to ensure the data could be considered a true indication of student performance in a group.

RFP (Request for Proposals), RFO (Request for Offers), RFI (Request for Information)

Definition: An invitation for vendors to submit a proposal on a specific commodity or service.

What This Means: These public processes not only ensure the agency receives competing proposals from which to choose, but also imposes upon the agency the requirement to describe their requirements to a level of detail that potential bidders can understand them.

Risk Mitigation

Definition: A structured approach to identifying and avoiding risk.

What This Means: A major project is always accompanied by risks, e.g., will there be enough money, will the launch deadline be met, will the users change their old ways and adopt the new ones, will the technology work, etc. Knowing those risks upfront and devising a plan to avoid, reduce, or respond to the risks is responsible management. (See our Optimal Reference Guide, **"From Risk to Reward - A Guide to Risk Management, Project Management Series Part II"** at www.espsg.com/resources.)

RSS (Really Simple Syndication)

Definition: RSS is a set of web communications formats used to publish frequently updated content such as blogs, news, or podcasts.

What This Means: Viewers of RSS content use special browsers called aggregators to watch for new content from dozens or even hundreds of web sites. RSS formats are specified in XML.

Scope

Definition: The identifying factors and requirements that define a project. The scope provides limitations on what a project does or does not cover.

What This Means: One of the most essential requirements for project management is to define the scope. The project's owner and those responsible for delivery must agree on scope to ensure everyone agrees when deliverables are acceptable. A statement of work or work breakdown structure typically defines scope. Knowing what is out of scope is just as important as defining what is in scope.

Scorecard

Definition: A scorecard is a report that summarizes the status on key performance indicators.

What This Means: Decision makers can quickly see current status and meaningful comparisons represented at a high level. Business scorecards report indicators across a variety of agency areas. There is typically no consolidation across those areas into a single performance index such as AYP. In education scorecard applications, the key performance indicators, if presented in a web-browser format, can be selected to drill down to a finer level of detail, possibly even to an individual's performance level.

Scorecards represent a level of forethought as do leading and lagging/trailing indicators that inform action. Like traditional statistical reports, scorecards are intended to display significant annual and other static measures. Unlike traditional statistical reports, scorecards are also intended to be accessed frequently to monitor changes in formative, leading indicators.

Security

Definition: Security is the protection of data against unauthorized access and unauthorized changes.

What This Means: Security ensures that data are available for use by those that need it when they need it. Security is achieved with policies, firewalls, authentication, authorization, physical barriers, audits, training, and constant vigilance.

Session Layer

Definition: In a multi-level application, the session layer is where the user's current experience is managed.

What This Means: The session layer keeps track of the user's current entries and clicks to make the experience more user-friendly and efficient.

SIF (Schools Interoperability Framework)

Definition: SIF is an open standard for exchanging data from one education software application to another.

What This Means: SIF has become widespread at the school district level to allow data entered into one application to update all other applications. For example, when a new student enrolls, entering basic information into the student information system would update the library, food service, transportation, instructional management, and other applications. State education agencies have begun to incorporate SIF into their collections to accommodate the school systems that are ready to have their data move directly from their local applications to the state. Other terms associated with SIF:

- **Choreography:** The technical design for how SIF exchanges data
- **Zone Integration Server (ZIS):** The software that functions as the U. S. Postal Department for moving data from the sender to the intended recipient
- **Agent:** The software that pulls data directly from an application and sends them to the ZIS
- **Horizontal Integration:** Connecting all the applications within a single agency (e.g., school or school district)
- **Vertical Integration:** Connecting local applications with a higher level agency
- **Vertical Reporting Framework:** The choreography for sending data from one level to another
- **Student Locator Framework:** The choreography for updating a student's data, assigning a statewide student identifier, and updating the local application with the assigned student identifier

Single Sign-On

Definition: A single sign-on is a specialized form of software authentication that enables a user to authenticate once and gain access to the resources of multiple software systems.

What This Means: Instead of signing on and off each time a user moves from one application to another, the user can be authenticated once, and move between applications.

SIS (Student Information System)

Definition: A software application for educational agencies to manage student data. Student information systems provide capabilities for entering student test and other assessment scores, building student schedules, tracking student attendance, and managing many other student-related data needs in a school, college, or university.

What This Means: The SIS has become central to a school's and district's information ecosystem. Over time, more districts have used the SIS as a consolidator of all information for a student, even though the design of such applications did not envision such a broad use originally. The SIS has become the central provider of official data about students to other transactional systems within a district, e.g., transportation, library services, food services, etc.

The basic functions of the SIS include registration, enrollment, attendance, and scheduling. Many SISs also perform grade reporting, discipline accounting, program participation, assessment recordkeeping, etc.

SOA (Service Oriented Architecture)

Definition: SOA is the modularization of business functions for greater flexibility and reusability.

What This Means: SOA is a technique for presenting technology and information system components as individual services. When functions in a large application are made into stand-alone services that can be accessed separately, they are beneficial to more users.

SOAP (Simple Object Access Protocol)

Definition: SOAP is a message-based standard process based on XML for accessing services on the web.

What This Means: Initiated by Microsoft, IBM and others, SOAP provides a way to communicate between applications running on different operating systems, with different technologies and programming languages.

Source

Definition: The source is where the data we want are found.

What This Means: The source is highly important to know because there can be many sources for the same data. In reality, there should be only one "authoritative data source." This is where the official data are kept. This is the only place to go if you want the real data. If you ask for the authoritative data source, and you get more than one possibility, then your agency is not in full control of its data.

Specifications

Definition: A specification is a set of requirements.

What This Means: A specification document details the exact operations and functionality of a system. Specifications must be as precise as possible to ensure an education agency gets what it needs from a technology product. Many education agencies do not have the expertise in-house to produce a fully functional specifications document. These specifications need to be both technical and representative of what the users really need.

SPEEDE/ExPRESS

Definition: SPEEDE/ExPRESS is a national standard for exchanging student records and transcripts using the ANSI X12 EDI protocols.

What This Means: A school, district, or postsecondary institution that produces a student record or transcript in the SPEEDE/ExPRESS format can send it electronically through a service such as the National Transcript Center. SPEEDE is the postsecondary format. ExPRESS is the PK-12 format. ANSI X12 EDI is rare in the PK-12 arena, but is used by over 600 postsecondary institutions.

Standards

Definition: Standards are developed by organizations as a basis of comparison or to establish an ideal. Standards used in education technology include ISO, EDI, XML, ODBC, SIF, PMI, EDEN/EDFacts.

What This Means: Data that are shared or reported according to standards are higher quality and more useful than data that are not.

Student Identifier

Definition: A number assigned to a student for tracking purposes.

What This Means: All states have accepted the reality that a permanent identifier is necessary to manage the education records of all students statewide. Although the Social Security Number is still used in a few states, all newer systems rely upon random or algorithmic numbers. (See our Optimal Reference Guides, **"Statewide Student Identifier Systems"** and **"Requirements for an RFP for Student Identifiers"** at www.espsg.com/resources)

Student Record

Definition: A student record contains information about the education process and outcomes for an individual student.

What This Means: Long known as the cumulative folder, the move to electronic records has changed the name of the accumulated data on a student to a "record," which can be paper or electronic. See Student Transcript for the difference between a student record and a student transcript. Multiple national standards are emerging that define the contents and formats for a student record, e.g., SPEEDE/ExPRESS, SIF, PESC, and many state-specific standards.

Student Transcript

Definition: A student transcript is a student's permanent academic record.

What This Means: The student transcript is now defined narrowly to be the secondary school document that certifies the student's academic record, typically for exchange with a postsecondary institution, employer, or other agency.

The student transcript's contents and formats have been defined by SPEEDE/ExPRESS, SIF, PESC High School, and various state-specific standards. The contents actually exchanged are determined by the sender, the receiver, and the purpose of the record.

Synchronous

Definition: Synchronous events are coordinated in time.

What This Means: For example, the interval between transmitting A and B is the same as between B and C, and completing the current operation before the next one is started is considered synchronous operations. (Contrast with Asynchronous.)

System

Definition: A system is more than one software application working together to achieve more than the individual applications can do on their own.

What This Means: You want systems more than applications because a system provides added value above and beyond what the individual applications can.

System Redundancy

Definition: System redundancy is the duplication of critical components of a system with the intention of increasing reliability of the system, usually in the case of a backup or fail-safe.

What This Means: Solutions often incur extra expenses to duplicate critical systems and sub-systems. Automated and quick manual recovery plans are often designed to ensure systems maintain a reliable status. Stringent hardware replacement agreements with hardware vendors are commonplace in this process.

TCP/IP (Transmission Control Protocol/Internet Protocol)

Definition: TCP/IP is a communications protocol.

What This Means: This is how data are communicated over the Internet. TCP ensures that data arrive intact and complete. Every location in a TCP/IP network requires an IP address to be found on the Internet.

Thin Client

Definition: A computer that works like a terminal when all the processing is done on another computer.

What This Means: For a software application, thin client means that all the user needs is a basic PC. Little or no software must be loaded to run on the PC; therefore, updates and performance issues are not the responsibility of the user. Thin clients may not store any data on the user's PC.

Trailing Indicator

Definition: A trailing indicator is a measure of an outcome.

What This Means: Trailing indicators come at the end of a process or program to measure success. They are also known as lagging indicators. A trailing indicator may be used as a leading indicator in an historical or longitudinal analysis.

Transactional Software

Definition: Transactional software manages work at a basic level.

What This Means: Student information systems, general ledger applications, discipline accounting programs are examples of transactional software applications with the main purpose of recording and maintaining a record of actions as they occur.

Transformation Rules

Definition: Transformation rules document how data are derived, calculated, or translated from one format to another, or from source data elements into a derived element.

What This Means: Transformation rules must be clear and specific to ensure that anyone or any application that accesses raw or source data will result in the same derived or calculated value.

UI (User Interface)

Definition: The user interface is what's displayed on the computer monitor for the user to understand and follow what's required to successfully use the application.

What This Means: Interfaces are expected to be user friendly. The best UIs require the user to navigate a minimum number of screens in order to complete a task.

UNIX

Definition: UNIX is an open source, multiuser, multitasking operating system that is widely used as the master control program in workstations and servers.

What This Means: The Open Group holds the trademark for the UNIX name (spelled in upper case) on behalf of the industry and provides compliance certification to the UNIX standard. Both UNIX and the C programming language, which UNIX is written in, were developed by AT&T. UNIX and C were freely distributed to government and academic institutions, causing it to be ported to a wider variety of machine families than any other operating system. As a result, UNIX became synonymous with "open systems."

Unofficial Data

Definition: Unofficial data are those that do not represent statistics certified or published as official by an agency.

What This Means: Unofficial data can be some of the most useful for data-driven decision making. Leading indicators are often unofficial. Unofficial data may be reported for trial analysis, early identification of trends, or trouble shooting.

Upload

Definition: The opposite operation of a download, to upload, is to send data from a local system to a remote system, FTP server, or website.

What This Means: Uploading data skips the risky process of re-entering data by sending all the data in a batch fro one system to another. The metadata standards are crucial to a successful upload.

Value-Added Model

Definition: A value-added model is a growth model capable of differentiating the influence of factors of interest, e.g., schools, teachers, demographics, programs, etc.

What This Means: Without being able to evaluate the influence of factors of interest, a model is merely a growth model. Value-added models level the playing field, compensate for factors out of the control of the student, even out the challenges different teachers face with the group of students in their classes—

generally, they make things "fair." Although some value-added models are very simple (i.e., group schools into broad categories by percent economically disadvantaged students), others require sophisticated statistical software applications to calculate complex formulas.

VoIP (Voice Over IP)

Definition: VoIP is a telephone service that uses the Internet as a global telephone network.

What This Means: With a broadband Internet connection, all of an organization's telecommunications can be sent using the Internet.

VSAM (Virtual Storage Access Method)

Definition: VSAM is an IBM access method for storing data, widely used in IBM mainframes.

What This Means: VSAM files were common in the mainframe supremacy era. They are still used today for mainframe applications.

WAN (Wide Area Network)

Definition: A WAN is a communications network that covers a wide geographic area.

What This Means: Unlike a LAN, which is within a school or other location, a WAN can connect multiple locations as large as a school system, state, or national organizations.

Web Analytics

Definition: The analysis and reporting of web site traffic.

What This Means: Web analytics software measures such concrete details as how many people visit a site, how many of those visitors were unique visitors, how they came to the site (i.e., if they followed a link to get to the site or came there directly), what keywords they searched to get to the site, how long they stayed on a given page or on the entire site, what links they clicked on and when they left the site, etc. The data is used for decision making.

X12

Definition: Also referred to as "ANSI X12" and "ASC X12," X12 is a protocol from the American National Standards Institute (ANSI) for electronic data interchange (EDI). X12 was the primary North American standard for defining EDI transactions. It merged with EDIFACT in 1997.

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What This Means: Applications can exchange data electronically using X12 standards to ensure identical formatting. SPEEDE/ExPRESS, the first electronic student record standard, was based upon X12 standards.

XML (Extensible Markup Language)

Definition: XML is an open standard for describing and formatting data and documents.

What This Means: In the education IT world, XML has caught on as a preferred way to exchange data. SIF is XML based. PESC's electronic student transcript standard is XML based. EDEN accepts XML files. Because XML is "self-defining," knowing what is being exchanged is clear. XML is only a format like HTML. XML is more precise and rigid than HTML.

About ESP Solutions Group

ESP Solutions Group provides its clients with *Extraordinary Insight™* into PK-12 education data systems and psychometrics. Our team is comprised of industry experts who pioneered the concept of "data-driven decision making" and now help optimize the management of our clients' state and local education agencies.

ESP personnel have advised school districts, all 52 state education agencies, and the U.S. Department of Education on the practice of K-12 school data management. We are regarded as leading experts in understanding the data and technology implications of the **No Child Left Behind Act (NCLB)**, **Education Data Exchange Network (EDEN)**, and the Schools **Interoperability Framework (SIF).**

Dozens of education agencies have hired ESP to design and build their student record collection systems, federal reporting systems, student identifier systems, data dictionaries, evaluation/assessment programs and data management/analysis systems.

To learn how ESP can give your agency *Extraordinary Insight™* into your PK-12 education data, call (512) 879-5300 or email info@espsg.com.

This document is part of *The Optimal Reference Guide* Series, designed to help education data decision makers analyze, manage, and share data in the 21st Century.

ESP Solutions Group

(512) 879-5300
www.espsolutionsgroup.com
Austin • Boston • Washington DC