AN OPTIMAL REFERENCE GUIDE

Has Your Scope Creep Created a Scope Monster?

A Solution to Control Data Scope

Extraordinary insight into today's education information

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Introduction

My colleagues here at ESP helped me look back over decades of experience developing and implementing education technology solutions—successful ones for decision makers. They ranged along the continuum from "on time" to "never quite finished as envisioned." Almost all were within budget because that is a personal and business standard of mine. The monster my teams fought daily in every project was scope creep.

As I drafted this white paper to advise on how to manage scope creep, I realized how incredibly negative the tone was. Of all the topics about which I have written, this one has to be the most dire and downbeat. So, I encourage readers to persevere through the tragedy to relish the optimism in the final solution and recommendations.

Too often the project managers for a client agency and a contractor sit across the table and disagree on when a deliverable is finished, when the acceptance sign-off should happen, and when the payment must be made.

At times, there are some trade-offs. For example:

- Sign-off now in exchange for more data loaded later
- Keep working longer in exchange for a sign-off if half of these additional data elements can be provided in two weeks

If both parties are truly objective, neither is likely to believe they got what they expected at the beginning of the contract.

Defining data scope is arguably the most difficult and the most important milestone in an ed tech project.

Incredibly, defining data scope is too often deferred, underperformed, delegated to the contractor, or assumed to be obvious by the nature of the project.

Data Scope is defined as the limits to which source data will be captured and moved into the destination database. Data Scope is the agreement by the education agency that this is their expectation for the contents of the database deliverable. Data Scope is the commitment of the contractor to capture and load these data, but not additional data without following the change management process.

ESP Insight

Scope Creep: *Uncontrolled changes or continuous growth in a project's scope if it not properly defined, documented or controlled.*

ESP Insight

Data Scope: *The agreed-upon source data to be moved by ETL into the ed tech solution's destination database to satisfy the contract.*

To define data scope in an ed tech project, ESP follows a methodology that validates the education agency's goals and the requirements of the contractor for precise documentation of and timely access to all data sources. The reality has been that many contractors have difficulty doing this. One reason is their people may be better at their technology and products than working with education agency people. Another is that the education agency may still be deciding what data need to be in their solution and when. This is where a hybrid consultant-contractor like ESP is useful. Even ESP working as a data scope broker for either the education agency or the contractor is invaluable.

ESP Insight

Ed Tech Project: *The implementation of an information system, solution, or application in an education agency or learning organization (Education Technology Project)*

To see the importance of having a broader perspective than what is typically brought to a project, look at Figure 1. Informally known as our "Teacher to Teacher" poster, this effectively positions an ed tech project as serving decision makers who have questions requiring data to answer. An ed tech solution doesn't merely drop into a client agency and solve its own problem—or the same one from the last client. To be used and useable, the ed tech solution has to load data that are of interest to the intended audience.

Data scope begins with discovery. ESP's experts will interview the agency's data stewards to determine the data sources, their status, and true availability. We'll give the client agency and the contractor a detailed Visio diagram showing those sources and the relationships among them for ETL. Our role will be to discover what's ready for ETL and what's not—and how difficult and timely each source will be to access.

One example is that an agency may propose a recently developed data warehouse as their source for most of their data. We might document that the data warehouse is not yet ready, not sufficient, not timely, or not loaded with all of the metrics needed. The real sources for the timely data may still be in various other locations. Even those may need updated documentation to be ready for ETL.

Being efficient investigators can save tremendous time for an agency's key staff at the crucial start of a project.

Commonly Held Beliefs about Ed Tech Projects

We here at ESP collect best practices, truisms, and generally accepted beliefs from our projects. We enjoy debating the universality and defensibility of each one.

Here are some beliefs that undermine the success of many ed tech projects.

1. Project management teams often believe in the existence of source data.

- Reality: Source data as required to meet the vision and goals of an ed tech project may not be readily available.

A common assumption of both the education agency project management and the contractor project management team is that all the source data specified and required for an ed tech project are actually available and accessible for ETL. An ed tech solution, e.g., database-dependent software application, requires certain data elements to populate its data model in order to satisfy an acceptable level of expectation of the users. Reality is that an education agency may not collect timely, quality data as required for all the domains or entities in the model.

2. Project management teams often believe in the existence of documentation.

- Reality: Documentation of data sources is often missing, out of date, or never created to the detail needed.

ESP Insight

Client Agency:
The education agency contracting for implementation of the ed tech project.

Documentation is seldom verified before a project is begun. Documentation takes time to create and competes with other priorities for scarce FTEs to keep it up to date. Underestimating the time and effort to keep documentation up to date is universal.

3. Education agencies often believe that contractors have implemented their solutions before such that they will fit snugly into the agency's requirements.

- Reality: The next agency may really be unique. The vendor may be encountering new domains or elements.

Commercial off the shelf (COTS) solutions are to be ready to work without customization. A SIS (student information system) may be COTS but require a tremendous amount of configuration. User-defined fields open an application up to significant customization. Users show creativity in reusing fields to customize applications.

ESP Insight

Contractor: *The vendor or consultant contracted to implement the ed tech solution (If the implementation is being conducted in-house, the client agency is also in the role of contractor.)*

4. Contractors often believe that a data element called the same in a source file is the same data element as the field with that name in their data model.

- Reality: Can we define student, faculty member, discipline incident, absence, total expenses, preschool—need I go on?

  Researchers understand the fundamental importance of the operational definition in an experiment. The same variable can be defined differently in separate experiments; thus, the results are not comparable between the two. The same concept applies with ETL. An authoritative data source must contain a data element defined the same way as that element in the destination database from which the analytics and dashboard metrics are going to be displayed.

5. Project managers often believe that tables and fields in a data warehouse hold timely, quality, useable data.

- Reality: A maturing data warehouse may take time to develop quality, timely data linkages.

  The emergence of data warehouses, especially longitudinal data systems, has given education agencies a go-to source for decision support data. The data within those databases need the same vetting as any authoritative data source requires before being accepted for ETL.

6. Project managers often believe that project offices will provide data on time this year.

- Reality: New and changed data collection processes do not always happen on time.

  Despite their best intentions, project offices don't always implement their new data collections on time. Thus, the old data sources may need to be accessed for a while longer.

7. Some agency project managers believe that the longer they delay in signing off on an ETL deliverable, the longer they control a contractor and the more source data they can get loaded.

- Reality: This behavior ultimately delays the overall project because deliverables back up lacking approval.

  Some project managers seem to never sign-off on deliverables. Maybe they don't want to be responsible if something is later found to be lacking. Maybe they want to be able to ask for more.

8. Contractors often believe the first answer they get really describes source data.

- Reality: Documentation needs to be verified quickly for accuracy and completeness.

  Contractors are usually on the clock and hope the first answer is right. They don't live by the rule that taking the time to get things right the first time saves in the long run.

9. The success of an ed tech project is based 80% on the technology or software and 20% on the data.

- Reality: Having the right timely, quality data is 80%. Today, most ed tech solutions work reasonably well to fulfill their promises. However, the ability of the users to provide the necessary data to meet their own expectations is more difficult.

10. Real-time data can populate official statistics.

- Reality: Official statistics require a designated point-in-time at which the data are cleaned and certified.

  Real-time data don't wait to be examined for updates, reviews by administrators, or adjustments for errors and omissions. Real-time data need to be sped to the users to be valuable. Official statistics need to be cleaned, vetted, and certified to be—well, official before they are reported.

Defining the Problem

If agreement isn't achieved on exactly what data will be captured and loaded into an ed tech solution, then the education agency is at risk of missing target dates, not receiving acceptable deliverables, and overrunning costs. Often this is lumped into scope creep. However, ESP's two decades of working with

education agencies and dozens of vendors have provided insight into the more precise cause—lack of agreement on data scope resulting from ill-defined source data.

The specific problem with data scope and source data is two-fold.

1. Education agencies often can't provide complete and timely documentation of data sources. At times, data sources aren't clearly defined in an RFP or contract.
2. Education agencies change or haven't exactly made up their minds yet about their data sources or their final destination data system requirements.

Over many projects, ESP's experts had to develop a methodology and tool set to address these contexts. Using PMI's basic PMBOK processes, ESP has defined an education-industry-specific remedy for unclear documentation and unresolved source data.

The benefits of this data scope methodology for an education agency implementing an ed tech project are:

· ESP's experts have developed efficient processes and tools for finding and securing data source documentation.

· ESP's experts have developed effective communication processes with education agency IT, content professionals, and contractor developers to achieve agreement on a written data scope document.

· ESP has documented the ETL mapping from sources to the contractor's solution's destination database to ensure the integrity of plans.

Simply put, the savings in costs to the education agency can be significant. The benefits in securing an on-time launch of a fully functional system are easy to imagine.

Achieving written agreement on scope with the documentation of data sources in hand—that's the foundation for a successful ed tech project.

Preventing the major risk factor in ed tech projects—scope creep—is essential. This methodology enables the education agency to hold the document that controls the data scope dialog throughout the project.

The Data

Ed tech projects depend on data—the right data—the data that will inspire educators to use the solution. The contractor believes their solution works—if the right data are loaded into it.

The problem most often encountered is that education agencies don't have their data readily and thoroughly documented for ETL. Discovery and gaining agreement on data sources that are within scope take many hours. Doing this efficiently up front saves hours and prevents reworking later. That translates to timelines met and acceptable deliverables.

ETL has to work to make an ed tech project work. DataSpecs® defines the data scope, documents the data sources, describes the transformations, details the loads, and names the people responsible for the data. This documentation is crucial to the written data scope document to be signed off on at the beginning of an ed tech project.

Providing the documentation and ensuring the data sources are ready must be a part of the project plan and agreement up front.

DataSpecs® was developed by ESP in our first year back in 1993 because we understood the need to have a metadata dictionary to control definitions. We quickly learned that the metadata dictionary also controlled collections, repositories, and outputs/reports that provided the core scope of every ed tech project.

The metadata that DataSpecs® manages for an ed tech project include:

- Where authoritative data can be accessed;
- What data are collected and the periodicity for their collection;
- How data are extracted, transformed, and loaded; and
- Whom to contact for definitive answers.

DataSpecs® is also aligned with national standards to comply with requirements based upon CEDS, Ed-Fi, SIF, etc. ESP's familiarity with standards will facilitate communications with clients as well as the creation of ETL mappings.

Data governance is a growing interest among education agencies. DataSpecs® is a foundational tool for managing data governance, and ESP has a comprehensive solution available to leverage the documentation performed for an ed tech project. We can work in partnership with a vendor to provide these services.

The Data Source Documentation

ESP's toolkit includes IS*Insight*™ for documenting and illustrating relationships among data sources. The magic is really behind the colorful Visio diagrams. See Figure 2 for a sample state education agency diagram. We interview data stewards who hold the keys to the source data crucial to your solutions' success. Our process documents data sources within the project's data scope—and others that form the agency's overall context. These others are useful for change orders and future phases.

The IS*Insight*™ diagram populates the DataSpecs® metadata dictionary for source-to-database mapping documentation.

ESP gained insight into the significance of data scope by writing funded SLDS grant applications with SEAs, implementing successful ed tech projects, and observing all the others.

Data scope management is the culmination of both the tools we use to assist SLDS vendors and agencies across the United States as well as our own experiences in delivering successful, on-time, and on-budget projects.

With the six data use priorities funded in the 2015 round of State Longitudinal Data System (SLDS) grants, the emphasis is on using existing data sources. However, those must now be tied down and mapped to the questions defined for fiscal equity and return on investment; educator talent management; early learning; college and career; evaluation and research; and instructional support. That will not be a straightforward task. That's exactly where ESP's data scope tools and expertise apply.

What we offer is understanding the context of the agency's vision and goals. Those governance and policy requirements, technical requirements, and data use requirements of the grant are well-known to us as well. We would recommend defining data scope before issuing an RFP. The vendors who will submit bids will be able to submit much better responses if they have more precise

and stable requirements.

However, having a data scope broker on the agency team to prepare the documentation during the sign-off stage at the beginning of the contract will also be invaluable.

Even if the agency opts to follow a waterfall development approach, data scope definition at the initiation of a project is imperative. Each sprint along the way can be benchmarked by the data scope. With the final destination well defined, evaluating the sprints will be easier for the project managers.

What does the ed tech project get from ESP? When an agency partners with ESP, there are specific deliverables available.

· IS*Insight*™: Graphic documentation of the agency's data sources, vendor's destination repositories, and product outputs

· DataSpecs®: Metadata dictionary mapping source data to destination display databases or operational databases for ETL

· Data Scope: Written section for the signed scope document describing data sources and destination mapping for what is in scope for project deliverables

· Change Management Services: On-going updates if requested

An education agency may leverage ESP's data scope management services and tools at different times for a project.

· Writing an RFP: IS*Insight*™ and DataSpecs® detail requirements and present a professional picture for an RFP. This allows bidders to submit more precise and valid cost proposals.

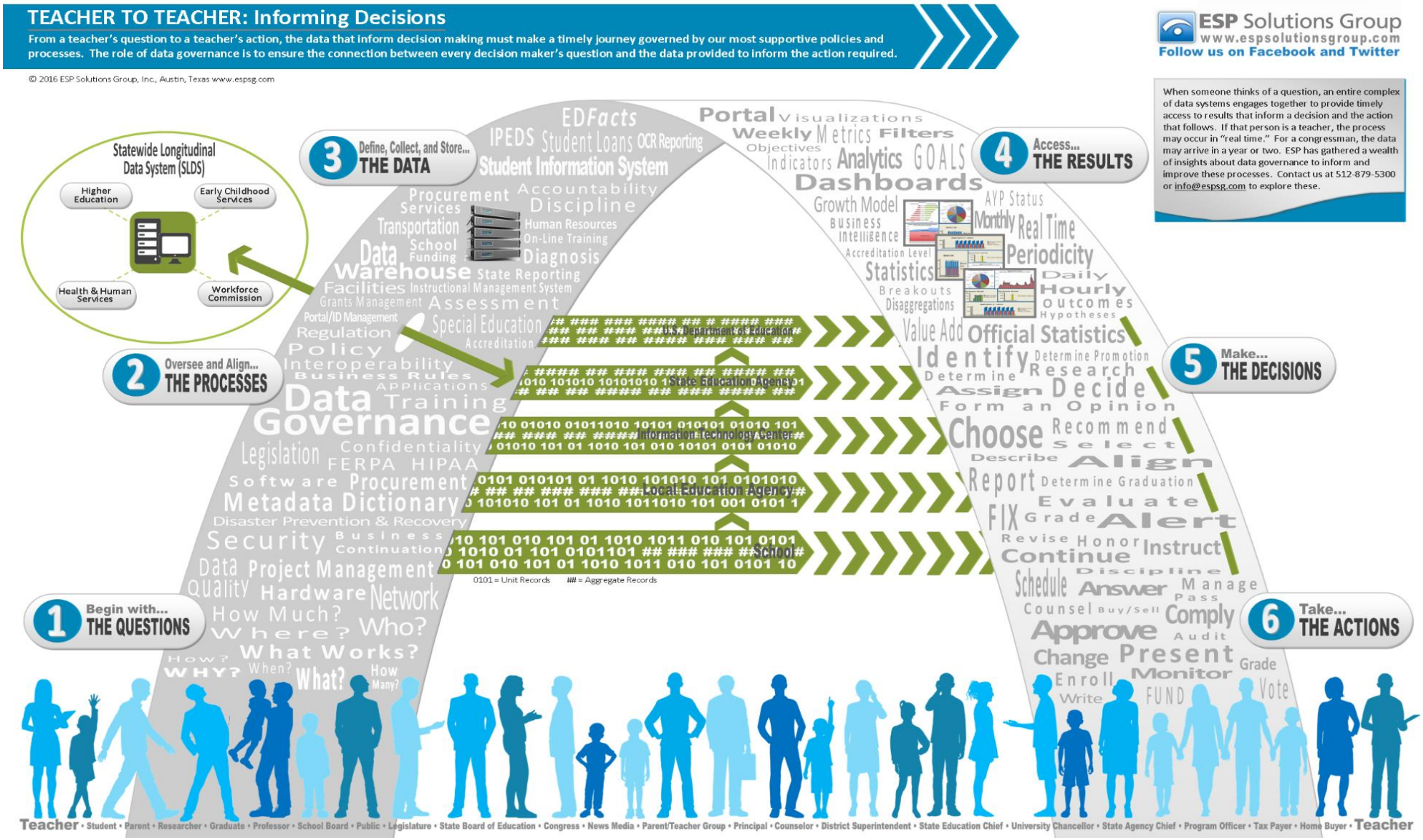
· Data Scope: ESP will develop a data scope document to include in the sign-off document for project scope as part of the initial project plan in a new contract.

· Change Management: ESP will assist in remediating a scope challenge during project implementation.

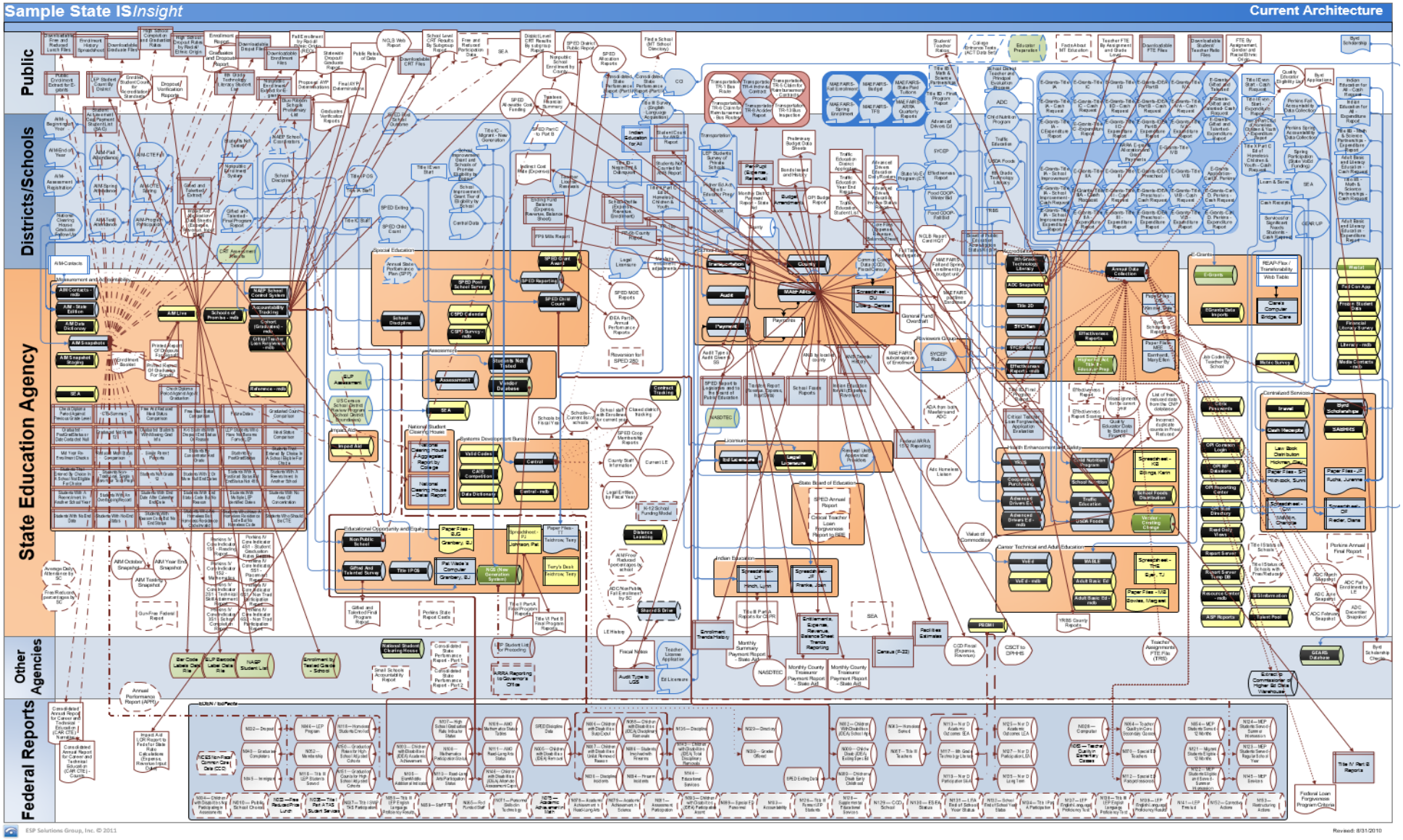
Having a clearly composed data scope document in writing and signed-off by both the contractor and the education agency

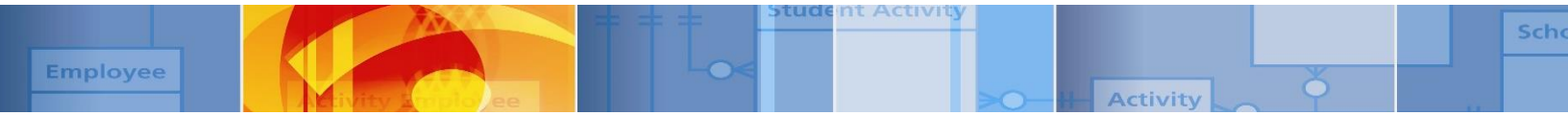
throughout the project is a factor of efficiency as well as a major contributor to meeting timelines and gaining agreement on and acceptance of final deliverables.

Attachment: A Teacher to Teacher: Informing Decisions



Attachment B: Sample State Education Agency IS*Insight*





About ESP Solutions Group

ESP Solutions Group provides its clients with *Extraordinary Insight™* into P20W 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' information systems.

ESP personnel have advised school districts, all state education agencies, and the U.S. Department of Education on the practice of P20W data management. We are regarded as leading experts in understanding the data and technology implications of NCLB, SIF, ED*Facts*, CEDS, state reporting, metadata standards, data governance, data visualizations, and emerging issues.

Dozens of education agencies have hired ESP to design and build their longitudinal data systems, state and federal reporting systems, metadata dictionaries, evaluation/assessment programs, and data management/analysis and visualization systems.

To learn how ESP can give your agency *Extraordinary Insight* into your P20W education data, contact us at (512) 879-5300 or info@espsg.com.

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

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