



Level 1 Validation

The approach used in most Ed-Fi implementations for Level 1 validation is to return errors encountered by the API back to the sending agent. The agent then records the error and presents it to the data administrator. There are two problems with this approach.

- There is no definition of how these errors are handled by the agent, leading to uneven support.
- Most vendors do not provide any summary of where the errors have occurred or what remediation is needed.

ESP addresses both issues with our API/ODS Manager (AOM) enhanced validation platform. The system first provides a consistent visual summary of what is happening with the API transactions. The summary is organized as shown to the right by Ed-Fi resource. It summarizes for the data manager what resources have been transmitted, how many transactions have been transmitted, and identifies where the errors are occurring.

School District #1 Vendor: PowerSchool

Home / District 501000 / API Submissions and Errors

Show: Resources On or after: 03-31-2020 School Year 2020

158612660 submissions in the database (before 03-01-2020) do not appear here (to improve performance). To view these old submissions, you should open SSMS and connect to FRY.

Resources	HTTP Request	# Total	# Errors
courseOfferings	POST	22	0
disciplineIncidents	POST	2	0
locations	POST	10	0
sections	POST	15	0
staffSectionAssociations	POST	14	0
studentProgramAssociations	DELETE	1	0
studentProgramAssociations	POST	2	0
students	POST	3	2
studentSchoolAssociations	DELETE	10	2
studentSchoolAssociations	POST	6	0
studentSectionAssociations	POST	632	0
studentSpecialEducationProgramAssociations	POST	2	0

If the data manager selects one of the errors from the summary, the manager navigates to the details page shown below.

School District #1 Vendor: PowerSchool

Home / District 501000 / API Error Analysis 2019-20 / Latest Trial / All DisciplineIncidents / L1DisciplineIncident

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The record(s) that this DisciplineIncident depends on probably arrived after this record. Try sending it again.

Element	Value
L1DisciplineIncidentId	1006
SchoolId	501055
IncidentIdentifier	24822
IncidentDate	2019-09-11
IncidentLocationType	
IncidentDescription	
StaffUniqueId	
ReporterDescriptionDescriptor	
Behaviors	
Weapons	

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Related Links

- [DisciplineIncidentBehaviors](#)
- [DisciplineIncidentWeapons](#)

This is the core of Level 1 validation that is not provided by any other validation methodology.

In this real example from one of our recent implementations, the transmitted data (a DisciplineIncident transmission) failed because a resource it is dependent on was not transmitted before it.

We can see from inspecting the Ed-Fi ODS that the required record is present, so we know that this most likely means that retransmitting the record will succeed. This "out of sequence" transmission is a frequent issue with Ed-Fi vendors and end users, and accounts for a large percentage of the transmission errors.

This suggestion of solution approach to validation is built into the Validation Service that supports API data validation as well as the other data content validation components of the system. It will appear again in examples of Level 2 validation below.

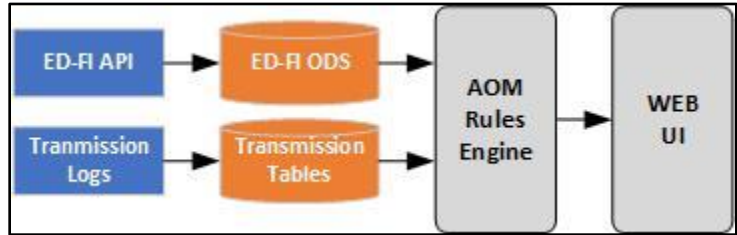
HOW DO I GET STARTED?

ESP offers a unique approach to our Ed-Fi Product Suite. At no charge, ESP will allocate one week of services to implement a structured evaluation with customer stakeholders. The evaluation considers the full set of service requirements, hosting considerations, and an assessment of the viable and desired data content. The result of the evaluation is a product and service offering with one-year guaranteed fixed price.



Enhanced Validation

ESP has developed a simple yet powerful approach to validating data for the Ed-Fi Technology suite. By saving a copy of the API transmissions in an MS SQL transmission table, the AOM Rules engine has access to the history of transmissions. This allows the type of analysis presented in our Level 1 validation example. It also allows an extensive suite of Level 2 validations to be administered to the Ed-Fi ODS providing unmatched levels of coherence and reference integrity.



Level 2 Validation

ESP began development of a rules engine technology customized to the education industry in 2005 in support of our State Report Manager (SRM) product. In 2016, we created the AOM version of this technology. It is integrated with the Ed-Fi Managed Services to allow the creation of data sets subject to robust validation. This validation engine is used at multiple levels of data management and allows the base set of validation rules to be extended for specific LEA, ESC, or SEA validation requirements as needed. The rules engine implements a robust set of rule types, shown in the table to the right.

Basic Rules	Required Field Validation, Option Set Validation, Checking against Authoritative Data, Data Format Validation, Value Range Validation, Value Comparison, Pattern Matching Rules
Intermediate Rules	Conditional Optional Set Validation, Conditional Data Format, Conditional Value Range, Conditional Value Comparison
Advanced Rules	Validation against Aggregated Values, Correlation and Validation across file types, Correlation and Validation across Years, Validations across Districts (State Level), Custom Query Rules, Custom Code Rules, Social Security Number Cleanup

features designed to validate educational data.

- The rules engine is very high-performance. Millions of records and hundreds of rules can be executed in less than five minutes.
- Collections of rules can be organized for data sets independent of each other allowing data to be validated on separate and independent schedules.
- The engine has rule design flexibility. For the underlying rule implementations, some rules naturally lend themselves to SQL, while others require coding in a language such as C# or Java. The rules engine allows both.

A rule can yield an ERROR or WARNING. This is extremely useful because sometimes an issue is suspicious, but not necessarily an ERROR. In such cases, it's good to notify the data-owner of the problem yet allow data to enter the ODS. An example is a student whose age is inappropriate for his grade-level. The AOM user interface available to data administrators that presents this validation issue is shown below.

AOM Level 2 Validation

Home / Latest Trial / All SummerStudents / SummerStudent

EDIT DELETE DELETE & REVALIDATE

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Element	Value
AKSID	1
LocalID	21
LastName	Jordan
FirstName	Stanley
MiddleName	
Suffix	
City	Galena - 99741
Zip	99741
BirthDate	12/30/1994
Gender	X
Race	1 - White (Caucasian)
SchoolID	50100 - Chugiak High School
Grade	10 - Tenth Grade
Disability	0 - Not Receiving Special Education Services

Type	Rule	Definition
<input checked="" type="checkbox"/> Warning	R74703	The age of the student falls outside the expected bounds <i>Birth dates for grade 10 are expected to fall between 09/02/1999 and 09/01/2003. The student's age on 9/1/2017 is 22 years.</i>
<input checked="" type="checkbox"/> Error	R74203	Gender must be M or F

This example highlights the two most important strategic advantages of the Level 2 AOM enhanced validation capabilities.

The AOM rules can be written to investigate any data relationship within the Ed-Fi domain.

The rules are built with explanatory text that can guide the users by clarifying the issue and where possible offer guidance for remediation.

The addition of enhanced validation to any Ed-Fi environment offers data managers an unmatched ability to create high quality data domains.