



April 10 – 12, 2019



Operationalizing SIS Data at Scale

2019 Ed-Fi Technical Congress

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Gen 1

~2012-14

Data: SIS

Use cases: SEA

XML binding

Data in

Extensions

Gen 2

~2015-2017

Data: SIS, early Assessment

Use cases: SEA and LEA
collab

XML and API / JSON
bindings

Data in

Extensions

Gen 3

~2018-present

Data: SIS, Assessment,
many other early

Use cases: SEA, LEA collab,
LEA

API / JSON; XML as legacy

Data in/out

Namespaced Extensions +
Core only

Gnarly Problem Space...

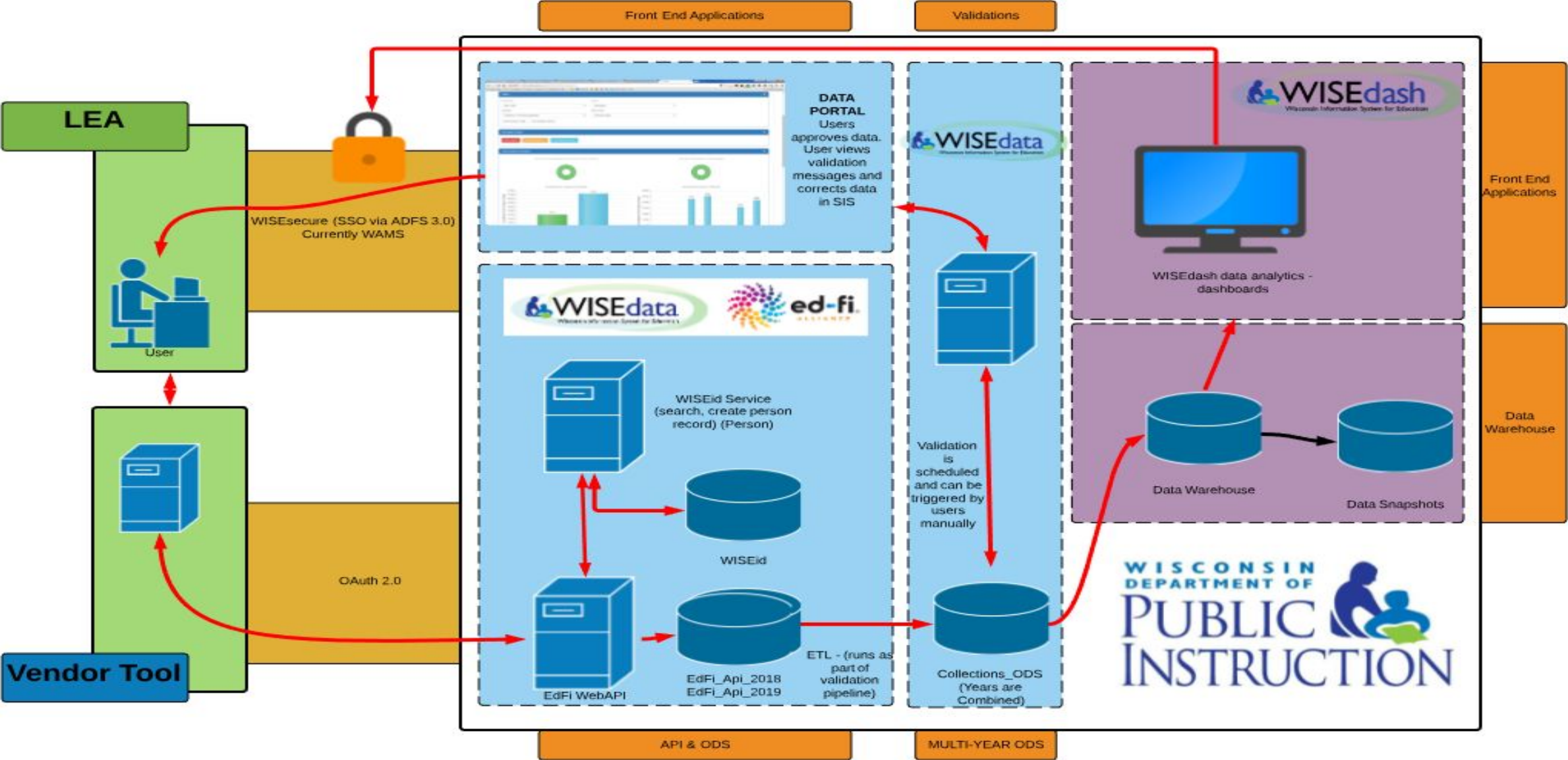
- SIS systems = highly customizable ERP (by design!)
- Local usage norms (vast!)
- Pushing business logic downstream
- “Manual” nature of K12 data movement (and love of it?)



Wisconsin Example

- 24 vendors
- 421 Public + 213 Private (voucher) LEAs submitting data to WISEdata Ed-Fi API
- **Data domains:** student demographics, enrollment, academic record, SPED, programs, roster, career education, discipline, finance
- Ed-Fi API end to end integration (vendor to SEA) since **2015**
- **Development team:**
 - 4 developers, 2 system business analysts, 1 QA, 1 vendor relations manager, 1 scrum master / product owner
 - Agile Scrum

Wisconsin Data Flow



ISSUE: Translation of SEA reporting requirements with Ed-Fi core data model is challenging and time consuming

Perceived cause

- Common use case repository that details when to use specific parts of the model is missing. SEAs must study other implementations, make educated guesses.

Effects

- Inconsistent SEA data model use resulting in challenges for SIS vendor tools integrating in multiple states

Proposed ideas:

- Core uses cases, not state specific, developed and published as a baseline for new and expanding SEA implementation usage
- SEA Peer / Ed-Fi Alliance review of new domain implementations prior to SEA laying down code

Wisconsin Example JSON Mapping & Use Cases

V 3.0 JSON MAPPING

File Edit View Insert Format Data Tools Add-ons Help All changes saved in Drive

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VER	A	B	C	D	E	F	G	H	I	
1	VER	Public Req	Choice Req	New /Existing resource	V 3.0 Always Required/Optionally Required/DPI Populated/	V 3.0 Ed - FI Resource	V 3.0 ED-FI Property	V 3.0 Data Type	V 3.0 Business Definition	Busin
2				New resource in V 3.0	Conditionally required	/studentEducationOrganizationAssociations				
3	SEOA # V3.0	Y	Y		Always required	/studentEducationOrganizationAssociations	id			
4	SEOA # V3.0	Y	Y		Always required	/studentEducationOrganizationAssociations	educationO Reference			

V 3.0 Usecases

File Edit View Insert Format Data Tools Add-ons Help Last edit was made yesterday at 10:00 AM by Meghana Aleti

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#	A	B	C	D	E	F	G	
1	#	Public	Choice	Same as V2.0/New in V3.0/ Modified in V3.0	Use Case Title	What to Submit/retrieve (For Vendors)	Notes	L2/L1 valid
2	JSON SAMPLE							
3	Student Demographics related to reporting group on /StudentEducationOrganizationAssociations resource							
4	Is it required to push student enrollment before pushing /studentEducationOrganizationAssociations							
5	V3 Student #2.0	Y	Y	New in 3.0	Student has multiple enrollments within the same school	Submit only one StudentEducationOrganization resource per school. In order to push SEOA enrollment should exist from that school. If multiple enrollments exists from the same school then only push one SEOA for that school. From School A , Push only one SEOA. One SEOA per school.	Enrollment 1 School A : 07/01/2018- 07/30/2018 Enrollment 2 School A: 09/01/2018- 06/30/2018	
	V3 Student #2.1	Y	Y	Modified in V 2.0	Submit edorg id as school id on SEOA	Via the API the following should be submitted /StudentEducationOrganizationAssociations		In V3.0 L1 id on SEOA



ISSUE: Misunderstanding of requirements, timelines between SEA, SIS vendors and LEAs

Perceived cause

- Not enough reoccurring communication and training

Effects

- Frustrated LEAs, SIS vendors, SEAs, poor data quality, vendor software rework

Proposed ideas:

- Requirement reviews, documentation from SEAs provided to vendors in Q1 for changes in next school year
- Early awareness and overviews with LEA/SEA/Vendor advisory groups; get early feedback prior to development
- Ongoing monthly LEA/SEA/Vendor advisory group meetings
- Dedicated SEA staff for vendor management

ISSUE: Major Ed-Fi releases require significant human capital for SEA, Vendors for development/integration testing

Perceived cause

- High number of use cases rework/validate when applicable, some SEAs have 10+ vendors to manage and test with

Effects

- Necessary part of the process, but does take away from new innovation, value add features for LEAs and very expensive for SEA and vendors

Proposed ideas:

- *Discussion*

ISSUE: Ed-Fi Core Missing Vendor Security Management Tooling That Meets SEA Use Cases

Perceived cause

- A number of the use cases weren't realized initially until SEAs began field implementations; other key priorities on roadmap; SEAs don't understand the issue until they are farther into implementation

Effects

- Lots of support tickets for development teams to manage, custom authorization strategies galore, paperwork for LEAs to complete, SEA custom application

Proposed ideas:

- Ed-Fi core tool that accommodates field use cases and allows for LEA self registration and secure vendor portal to obtain Ed-Fi claimset details by LEA

Wisconsin Ed-Fi Credential Tool

WI DPI Administrator View

▼ Jaiudd_test

Jaiudd_test

Edit

⬅ Delete

▶ JMC

jmcinc.com

Edit

✕ Delete

▾ JohnSIS

JohnSIS

Edit

✕ Delete

+ Add Application

	Application Name	Claim Set Name	Profile	SPED	Discipline	No Access After	Read Only Prior To		
▾	JohnSIS - Public	Finance						Edit	✕ Delete

+ Add API Client

	Api Client Id	Api Client Name	Key	Secret	Is Approved	User		
▾	383	UATTest - Sun Prairie	UATTest - Sun Prairie	0-0010-006-1600-1000 XXXXXXXXXXXX	true	John Raub	Edit	✕ Delete

+ Add Agency

	Agency Key	Agency Name	LEA	City		
▾	7533	Sun Prairie Area School District		Sun Prairie	Edit	✕ Delete

School Key	School Name	City
6	Horizon El	Sun Prairie
149	Prairie Phoenix Acad	Sun Prairie

Wisconsin Ed-Fi Credential Tool

LEA Self Registration

Add Subscription

Vendor Name	<div>Skyward</div>
Resource Access	<div>Write on all student with special education write access ending after a specified year</div>
No Access After School Year	<div></div>
Read Only Prior To School Year	<div></div>

By subscribing, you are agreeing to the following:

1. District data is required to be collected and then housed at the Department of Public Instruction through the Wisconsin Information System for Education. This agreement will authorize SIS and domain specific vendors to access and use limited educational records for Districts housed at the District, in the cloud, or housed by DPI's Wisconsin Information System for Education and is intended solely for the purpose of state and federal reporting and/or to provide value added services for Districts.
2. Pursuant to the Family Education Rights and Privacy Act ("FERPA"), 20 U.S.C Section 1232g, 34 C.F.R. 99.33(b), an education agency or institution such as a District may disclose personally identifiable information from student education records with the understanding that the party receiving the information may make further disclosures of the information on behalf of the education agency or institution if the disclosures meet the requirements of 34 C.F.R. 99.31 and if the education agency or institution has complied with 34 C.F.R. 99.32(b), which requires a record of the disclosure, including the names of the additional parties to which the receiving party may disclose and the legitimate interests which each of the additional parties has in requesting or obtaining the information.
3. The District understands that it retains the rights to all data from its educational records and that this request does not in any way waive its rights to that data. By subscribing to the vendor, District acknowledges that it has the necessary authority to give this permission.



ISSUE: LEAs don't understand the end to end data flow and get frustrated when data quality issues don't get resolved

Perceived cause

- No complete picture presented to LEAs so they can see the state of data at different stages; many SIS vendor tools don't indicate which fields map to Ed-Fi API and don't present sync success / failure in friendly way to LEAs

Effects

- Frustration from the LEA users, lower quality data at snapshot, bad look for Ed-Fi, SEA process

Proposed ideas:

- Create better vendor tooling that confirms data transmission and SEA provides pipeline view from vendor API submission to data quality validation

Wisconsin LEA 'Pipeline' Homepage

Data Pipeline Status

School Years: ☒ 2018 - 2019 ☐ 2017 - 2018

Vendor(s) ⓘ

☐ Include API Read (GET) transactions ⓘ

2018 - 2019

Oasys LLC

3/17/2019 10:04:10 PM

Powerschool

3/18/2019 9:58:25 AM

Last request to WISEdata Api

Transactions in the last 24 Hours

Aggregate Name ↑	HTTP Method ↑	~ Error Count*	~ Success Count*	Date/Time of Last Transaction
▶ StudentSpecialEducationProgramAssociation	POST	0	1	3/17/2019 10:04:10 PM
◀ StudentSpecialEducationProgramAssociation	PUT	1	1	3/17/2019 10:04:09 PM
Date/Time	Error Message	Details	KBA	
3/17/2019 10:04:09 PM	Validation of 'StudentSpecialEducationProgramAssociation' failed. Error=[100063] End date (01/18/2019) is prior to the begin date (02/19/2019).	View Json		

JSON Data - StudentSpecialEducationProgramAssociation

```
{
  "id": "100063",
  "educationOrganizationReference": {
    "educationOrganizationId": 5495,
    "link": {
      "rel": "Education Organization",
      "href": "/educationOrganizations?educationOrganizationId=5495"
    },
    "programReference": {
      "educationOrganizationId": 48856,
      "type": "Special Education",
      "name": "Special Education",
      "link": {
        "rel": "Program",
        "href": "/programs?educationOrganizationId=48856&type=Special+Education&name=Special+Education"
      },
      "wiDpiSchoolReference": {
        "schoolId": 4924,
        "link": {
          "rel": "School",
          "href": "/schools?schoolId=4924"
        },
        "studentReference": {
          "studentUniqueId": "100063",
          "link": {
            "rel": "Student",
            "href": "/students?studentUniqueId=100063"
          },
          "wiDpiFapeResponsibleSchoolReference": {
            "schoolId": 4924,
            "link": {
              "rel": "School",
              "href": "/schools?schoolId=4924"
            },
            "studentSchoolAssociationReference": null,
            "beginDate": "2019-02-19T00:00:00Z",
            "endDate": "2019-01-18T06:00:00Z",
            "reasonExitedDescriptor": "Exited",
            "servedOutsideOfRegularSession": null,
            "ideaEligibility": true,
            "spec": "02-07T00:00:00Z",
            "iepReviewDate": null,
            "iepBeginDate": "2019-02-19T00:00:00Z",
            "iepEndDate": "2019-02-20T00:00:00Z",
            "wiDpiParentPlacedPrivate": false,
            "services": [],
            "serviceProviders": [],
            "wiDpiStudentSpecialEducationProgramAssociationDisabilities": {
              "disabilityDescriptor": "LD",
              "reporting": true,
              "etag": null
            }
          }
        }
      }
    }
  }
}
```

Copy to clipboard



Wisconsin LEA 'Pipeline' Homepage

- STEP 1 - WISEdata API: Has my vendor tool sent data in the last 10 days?

WISEdata

STEP 1 - WISEdata API

2018 - 2019

	Enrollment	Program	Discipline
Data Last Received	3/18/2019 9:03:21 AM	3/17/2019 10:04:09 PM	3/15/2019 2:26:28 PM

3/18/2019 7:59:21 AM

Current Year

Green 0 - 10 ($x \leq 10$)

Yellow 10 - 20 ($10 < x \leq 20$)

Red 20 ($x > 20$)

Prior Years

Green 0 - 30 ($x \leq 30$)

Yellow 30 - 60 ($30 < x \leq 60$)

Red 60 ($x > 60$)

STEP 2 - WISEdata Portal

<https://wisedata.dpi.wi.gov/WISEdataPortal/Home/ApiDataLastReceived?schoolY...>

<https://wisedata.dpi.wi.gov/WISEdataPortal/Home/ApiDataLastReceived?schoolYear=2...>

Enrollment

Name	Last Modified
Student Academic Record	
Enrollment Wisconsin Extension	03/18/2019 10:15:00.05
Enrollment	03/18/2019 09:03:21.54

Wisconsin LEA 'Pipeline' Homepage

- **STEP 2 - WISEdata Portal:** Does WISEdata Portal have the latest data my vendor successfully sent to WISEdata? If you see **RED**, click the button!

STEP 2 - WISEdata Portal

WISEdata Portal Database - Data Last Received

The goal of this section is to alert you when the data in the WISEdata Portal database is out of sync with the latest data pushed by vendor(s) to the WISEdata API database. If you see a green checkmark this means the data domain is in sync between what the vendor(s) have sent and what is in WISEdata Portal. If you see a red checkmark, data isn't in sync and you need to click on the 'Queue Import & Validation' button located in 'Step 2' or on the Validation Message page. This will pull data over to the WISEdata Portal database from the WISEdata API database and run validation rules and calculations.

Drill into to each data domain to see data record counts for each set of data areas under each domain.

Queue Import & Validation

Validation Run Status - Pending [Projected Start : 3/18/2019 11:02:36 AM] Validation Last Run - 3/16/2019 3:38:34 AM

☐ Notify me when validation is completed john.raub@dpi.wi.gov

2018 - 2019

	Enrollment	Program	Discipline	Roster
Data Last Received	3/18/2019 9:03:21 AM	3/17/2019 10:04:09 PM	3/15/2019 2:26:28 PM	3/18/2019 7:59:21 AM

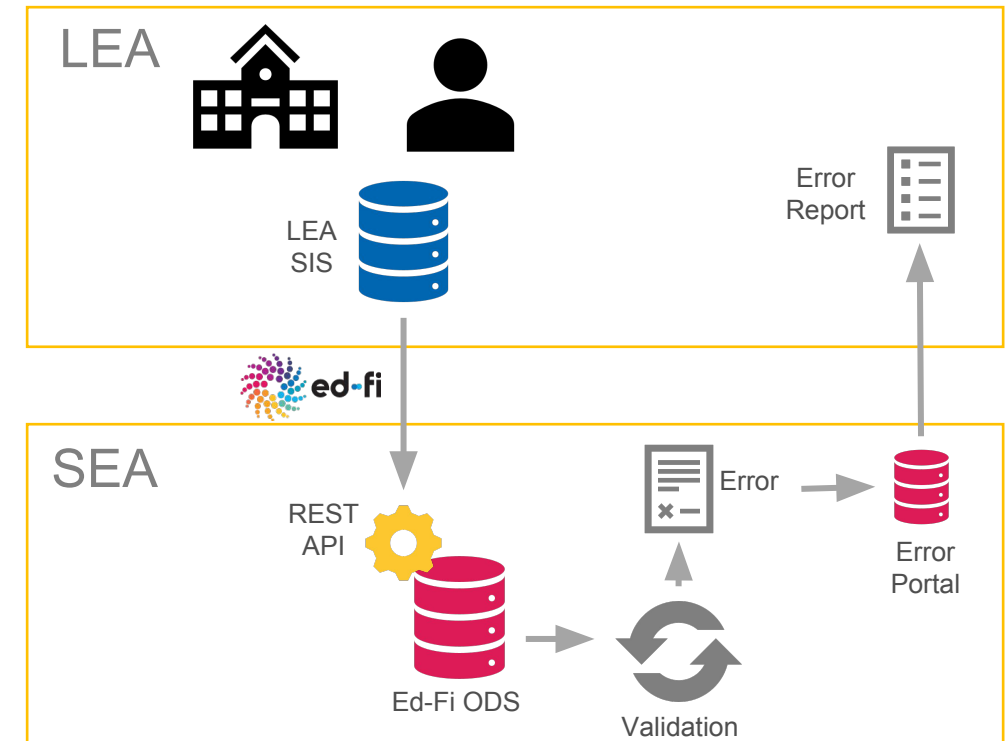
https://wisedata.dpi.wi.gov/WISEdataPortal/Home/OdsDataLastReceived?schoolY...
https://wisedata.dpi.wi.gov/WISEdataPortal/Home/OdsDataLastReceived?schoolYear=2...

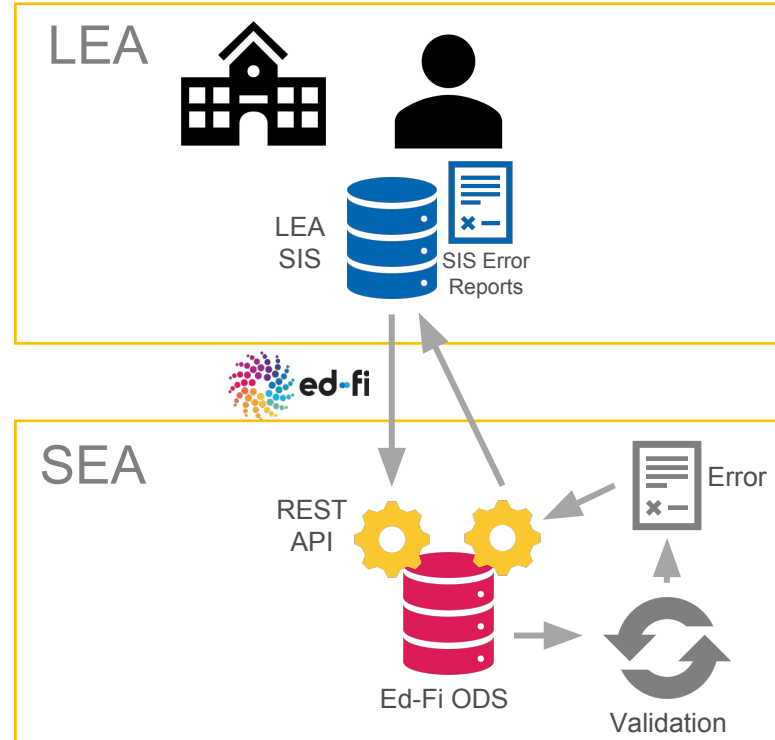
Enrollment		
Name	Last Modified	Record Count
Enrollment	03/18/2019 09:03:21.54	7602
Enrollment Wisconsin Extension	03/18/2019 09:03:21.54	7590

Program		
Name	Last Modified	Record Count

ISSUE: Validation and “round-tripping” of errors

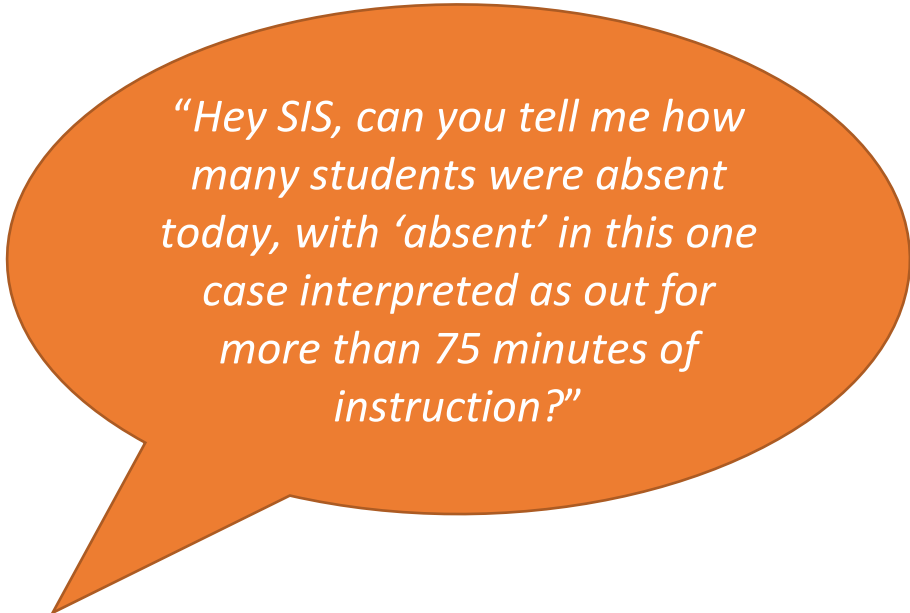
- Perceived cause
 - Highly operational system + many downstream consumers = issues only found later
- Effects
 - Inefficiency: staff fixing errors in upstream systems
- Proposed ideas
 - Standard format for validation errors and (on-manual) transport between systems





ISSUE: Pushing business logic into the API surface

- Perceived cause
 - Education agencies push business logic upstream to providers
- Effects
 - Local business logic = non-reusable code in SIS systems
- Proposed ideas
 - Ed-Fi Alliance reviews of SEA data specifications (but can't scale)

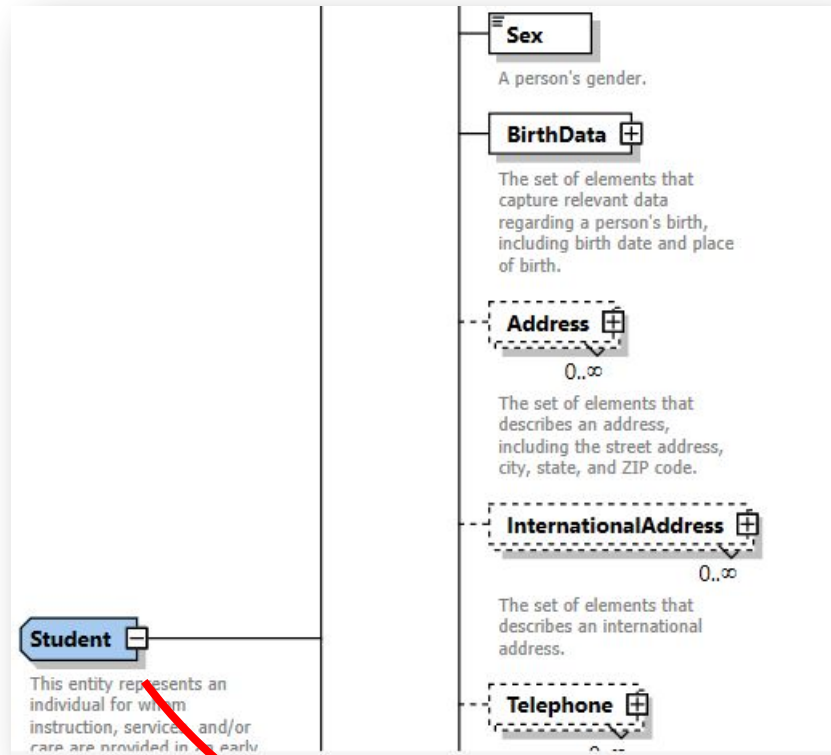


“Hey SIS, can you tell me how many students were absent today, with ‘absent’ in this one case interpreted as out for more than 75 minutes of instruction?”

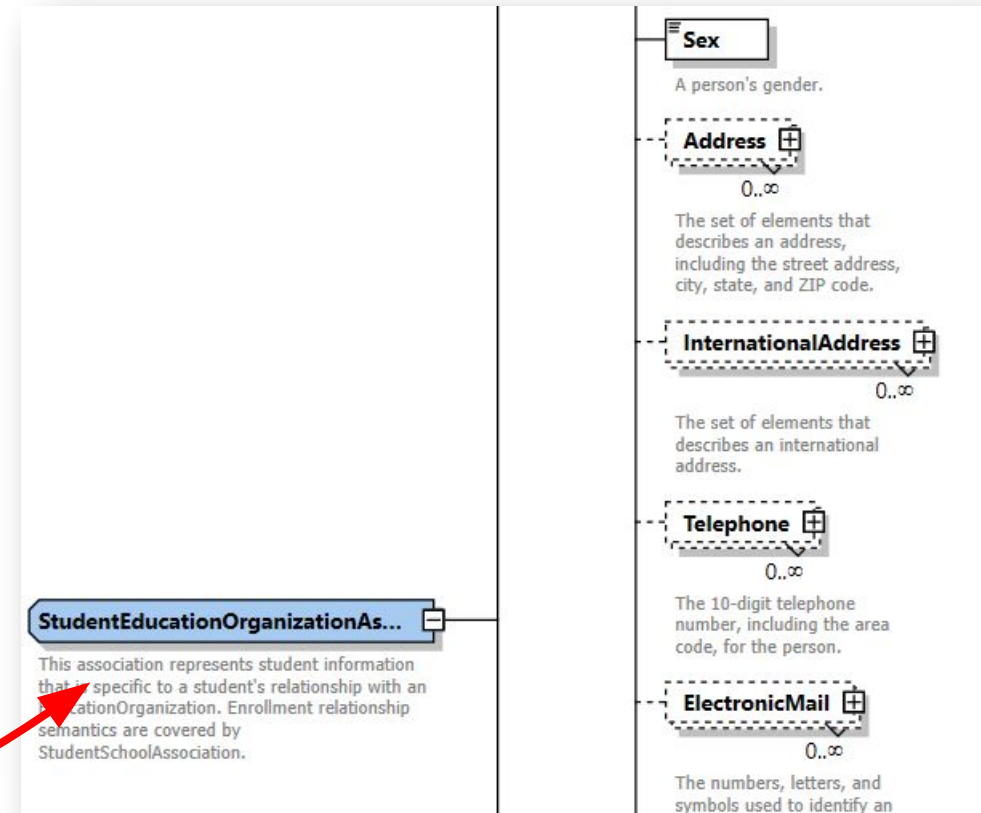
Issue: Data model collisions

- Perceived cause
 - Different use cases = different domain models
- Effects
 - Sub-optimal (or even confusing) experiences for some data consumers or clients
- Proposed ideas
 - ?

Ed-Fi UDM 2.x



Ed-Fi UDM 3.x



Great for SEAs, but probably confusing for local assessment systems!

Discussion & Questions

Thank You!