



MSIX Data Quality Initiative

Methodology and State Engagement Webinar

March 27, 2014

Agenda and Presenters

- Introduction
- Methodology
- OME-State Engagement Overview and Action Plan
- Question and Answer

Presenters



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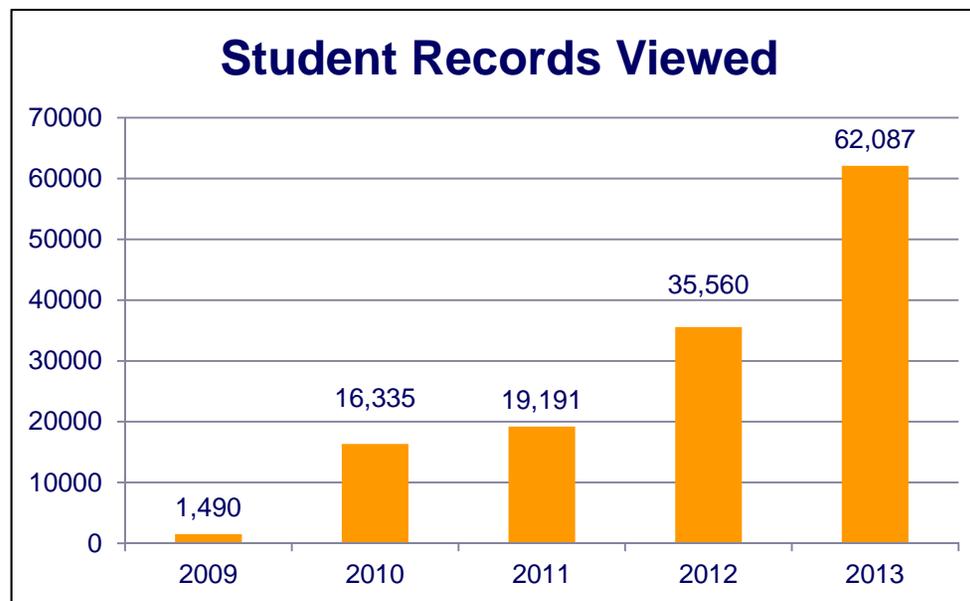
Introduction

MSIX Background and Accomplishments

The Migrant Student Information Exchange (MSIX) is the system that enables States to share educational and health information on migrant children who move between States and who, as a result, have student records in multiple States information systems.

MSIX Goals

- **Goal 1:** Create an electronic exchange for the transfer of migrant student education and health data amongst the States.
- **Goal 2:** Promote the use of MSIX.
- **Goal 3:** Ensure the use of the consolidated migrant student record for the purposes of enrollment, placement, and accrual of credit of migrant students in school and migrant education projects.
- **Goal 4:** Produce national data on the migrant population.



Introduction to MSIX Data Quality

Engaging in the Data Quality Initiative (DQI) helps the ability of the Office of Migrant Education (OME), States, school administrators, and other stakeholders to effectively support the Migrant Education Program (MEP).

Current State

Through user feedback and other observations, some MSIX student records and reports lacked thorough data to effectively serve students. In addition, State migrant system stakeholders have requested detailed guidance to help improve quality to data to MSIX.

Goals and Objectives

- Provide **tools** and **clear guidance** for States to provide more thorough data submissions to MSIX
- Support MSIX goals and data collection

Intended Outcomes

- Improve migrant student experience through transfer of more **accurate** and **complete** records
- **Enable local education institutions** to better place, enroll, and attribute credit to migrant students

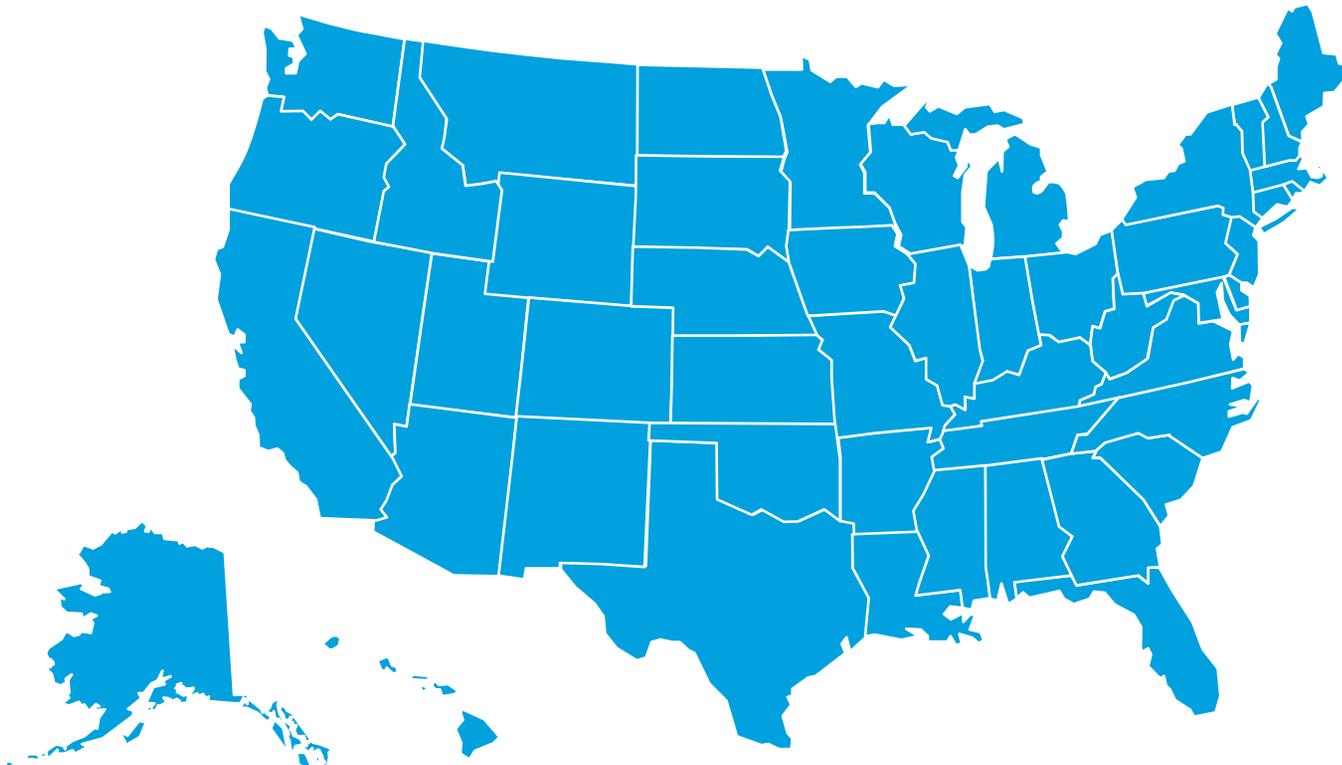
The MSIX Team will perform the majority of the analysis of data quality and States will validate findings.

Scope of States

OME has begun State outreach for DQI participation. The list of State participants is not final and OME is currently accepting additional States participants.

OME can only support a limited amount of States on a first come, first served basis.

This is a learning opportunity, vendors, States, and OME!



Data Quality Initiative Overview

OME began a pilot MSIX DQI in the Summer of 2013 with a prioritized and scaled approach.

	August 2013 – March 2014	March 2014 – April 2014	April 2014 – Onwards
	Develop Methodology and Analyze Data	Engage Pilot States	Support States
Actions	<ol style="list-style-type: none"> 1. Defined goals and objectives of DQI 2. Defined DQ standards and measures 3. Developed DQ maturity model and define thresholds 4. Evaluated data quality summaries for each State 5. Baselined State and National DQ valuations 	<ol style="list-style-type: none"> 1. Defined scope to address DQ issues 2. Socialize DQ assessments with selected States 3. Engage with States to document cause of DQ issues 4. Develop action plans to resolve DQ issues for each selected State 	<ol style="list-style-type: none"> 1. Discuss strategies with States to implement recommended action plans to help improve DQ 2. Assist States to refine recommendations as needed 3. Provide progress updates to States and OME
Outputs	<ol style="list-style-type: none"> 1. DQ Standards and Measures Document 2. Determine priority Minimum Data Elements (MDEs) 	<ol style="list-style-type: none"> 1. Baseline data quality measure 2. Action Plan (per State) <ul style="list-style-type: none"> • Identified cause(s) of DQ issues • Recommendations to improve DQ for targeted areas 	<ol style="list-style-type: none"> 1. Recurring updates to State Action Plans 2. Continuous updates to DQ Standards and Measures 3. Re-evaluate data quality measure

Defining Scope and Prioritizing DQI

DQI focuses on MDEs that are high impact in enrollment, placement, and credit accrual. MDEs in this initiative include, but are not limited to:

Demographic & Enrollment

- Birth Date*
- Continuation of Services Reason*
- Enrollment Date*
- Qualifying Arrival Date*
- Residency Date*
- Withdrawal Date*
- Grade Level*
- Enrollment Type*
- PFS Flag
- IEP Indicator
- LEP Indicator
- MEP Project Type
- Qualifying Move From State
- Qualifying Move To State
- First Name
- Last Name 1
- State Student Identifier
- State Student Identifier Type

Assessments

- Assessment Administration Date
- Assessment Type
- Assessment Content
- Assessment Interpretation

Course History

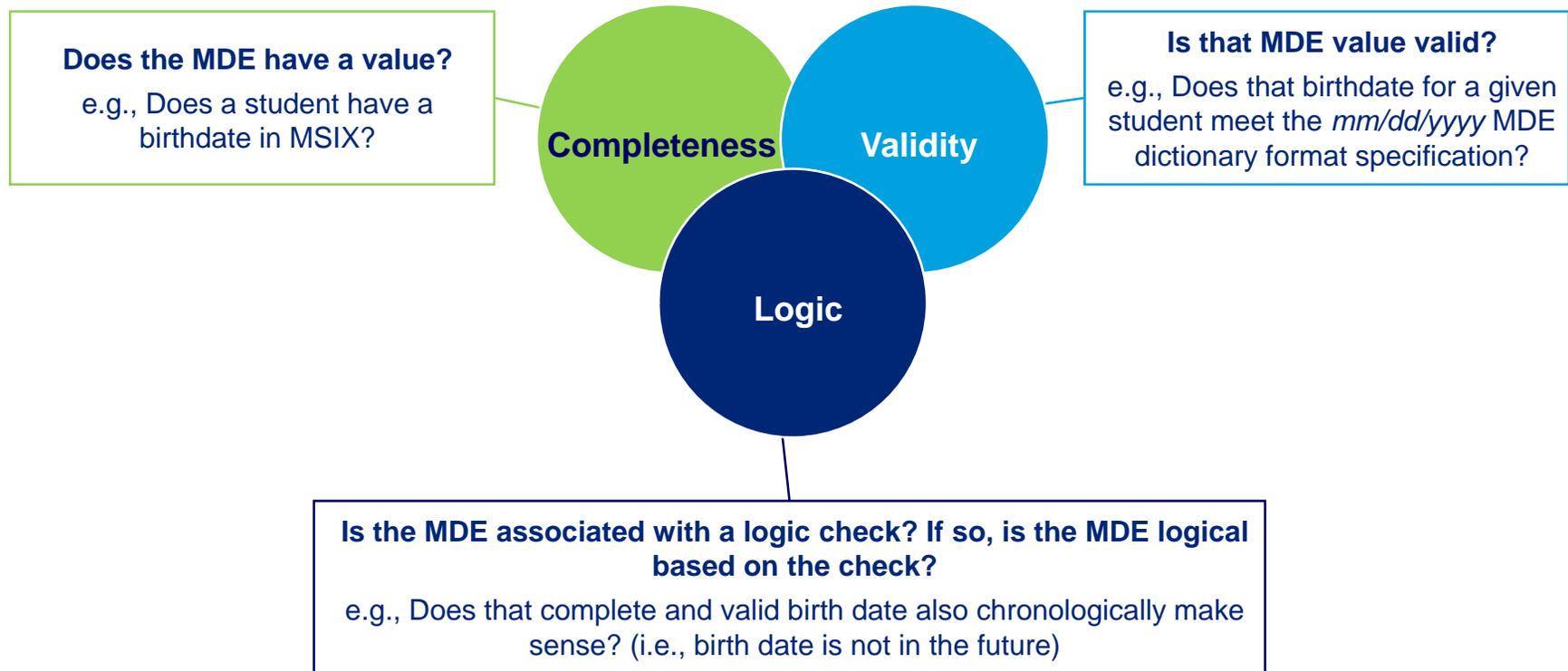
- Grade-to-Date

Focusing on prioritized MDEs creates a manageable process and provides immediate benefit to States.

Methodology

Data Quality Dimensions

The MSIX DQI methodology follows industry best practices in using the dimensions of completeness, validity, and logical measures. In the context of MSIX, a good quality MDE provides the best information for timely student enrollment, placement, and credit accrual.



DQI Standards and Measures

The Standards and Measures document contains attributes, measures, and logic rules for each MDE in scope of the DQI.

DQI Standards and Measures Sections	
Overview Includes instructions, table of contents, and lifecycle visuals.	Focus Area Analysis Depicts the mapping of all MDEs by business focus areas.
MDE Priorities - Round 1 Lists all prioritized MDEs, and their measure weights.	Logic Tests This tab describes all of the logic checks including pseudo code, summary, and pass /fail conditions.
Scoring Weighting – Round 1 Formulas behind the DQI measures.	MDE Tabs Depicts the breakdown of business focus areas and logic rules applied to each priority MDE.

The DQI Standards and Measures document is designed to be actively updated through input from both States and OME. This will ensure that data quality criteria is robust and relevant.

Standards and Measures Document – Logic Tests Example

[Return to Standards & Measures Home](#)

Logic Rule ID	Tested MDE	Logic Question	Developer Friendly Language	Rule
1	Assessment Interpretation	Does Assessment Type = '01' and Assessment Interpretation = Advanced, Passed, Proficient,		State Assessments should use the Assessment Interpretation values Advanced, Passed, Proficient.
2	Assessment Content	Does Assessment Type = '01' and Assessment Content <> 'MME - Reading', 'READING', 'Read', 'Reading', 'MI Access - Reading', 'MEAP - Reading', 'ISAT Reading', 'ENGLISH ASSESSMENT', 'English: Reading', 'MEAP - English Language Arts', OR 'MI Access - English Language Arts'? Of these Assessment Types, does Assessment Content = 'Reading'?	Does Assessment Type = '01' and Assessment Content <> 'MME - Reading', 'READING', 'Read', 'Reading', 'MI Access - Reading', 'MEAP - Reading', 'ISAT Reading', 'ENGLISH ASSESSMENT', 'English: Reading', 'MEAP - English Language Arts', OR 'MI Access - English Language Arts'? Of these Assessment Types, does Assessment Content = 'Reading'?	State Assessments that relate to reading should use the value 'Reading' for Assessment Content.
3	Assessment Content	Does Assessment Type = '01' and Assessment Content = 'ISAT Math', 'MATH', 'MATH ASSESSMENT', 'MI Access - Mathematics', 'MME - Mathematics', 'Mathematics', 'MEAP - Mathematics'? Of these Assessment Types, does Assessment Content = 'Math'?	Does Assessment Type = '01' and Assessment Content = 'ISAT Math', 'MATH', 'MATH ASSESSMENT', 'MI Access - Mathematics', 'MME - Mathematics', 'Mathematics', 'MEAP - Mathematics'? Of these Assessment Types, does Assessment Content = 'Math'?	State Assessments that relate to math should use the value 'Reading' for Assessment Content.

Completeness

If the States do not provide values for MDEs, then States should explore why they're not providing it. Often times there are valid reasons for not providing values for certain MDEs.

States are expected to provide values for MDEs based on appropriate age and grade level. Completeness will be measured by a State's ability to provide a value for each MDE. This binary test is the initial check of data quality.

2.2 Analysis Detail: Completeness						
MSIX Team Analysis					State POC Response	
MDE	% Missing	# Not Complete	# Total	Notes	Agree / Disagree	Notes
Birth Date	100.00%	5,384	5,384			
Enrollment Date	100.00%	67,835	67,835			
Withdrawal Date	63.78%	4,098	6,425			
Grade-to-Date	63.78%	4,098	6,425			
Residency Date	100.00%	30,396	30,396			

*Chart contains mocked-up data for illustrative purposes only

Validity

Validity will be measured only on the values provided by each State. Does the data follow the proper value format (where applicable)

When States provide MDE values, they must follow the specified format and value scheme. DQ evaluation will be measured by the State's ability to submit MDE values according to the MSIX file specification.

2.3 Analysis Detail: Validity

For specific guidance on correct formatting for each MDE please refer to the MDE List found at the following location when logged into the MSIX application - Home Page > Help > Technical Reference Materials > MDE List

MSIX Team Analysis				State POC Response	
MDE	% Invalid	# Not Valid	# Total	Agree / Disagree	
Birth Date	100%	6,425	6,425		
Enrollment Date	98.18%	6,308	6,425		
Residency Date	95.56%	839	878		
Grade-to-Date	33.59%	5,816	17,313		

*Chart contains mocked-up data for illustrative purposes only

Logic

MDE logic checks were developed for applicable MDEs that are interdependent on other MDEs. Reviewing and refining logic checks will be an iterative process among OME and States to develop a thorough repository of logic rules.

Logic tests will be conducted based on the defined program rules.

2.4 Analysis Detail: Logic						
MSIX Team Analysis					State POC Response	
Logic Rule #	Logic Rule Description	% Illogical	# Not Logical	# Total	Agree / Disagree	Notes (proposed changes in logic rules)
5	Dates should not be in the future.	100%	6,425	6,425		
13	A Basic School Program (Type = 01) that is School-based should have a School Identification Code.	98.18%	6,308	6,425		
17	A Summer/Intersession MEP-Funded Project (Type = 03) that is School-based should have a School Identification Code.	95.56%	839	878		

*Chart contains mocked-up data for illustrative purposes only

MDE Weighted Quality Measure

The Quality Measures (CQM, VQM, LQM) that are applicable to the MDE are multiplied by a weight to calculate a Weighted Quality Measure (WQM). This calculation was performed for **each MDE** selected.

Calculating MDE Weighted Quality Score

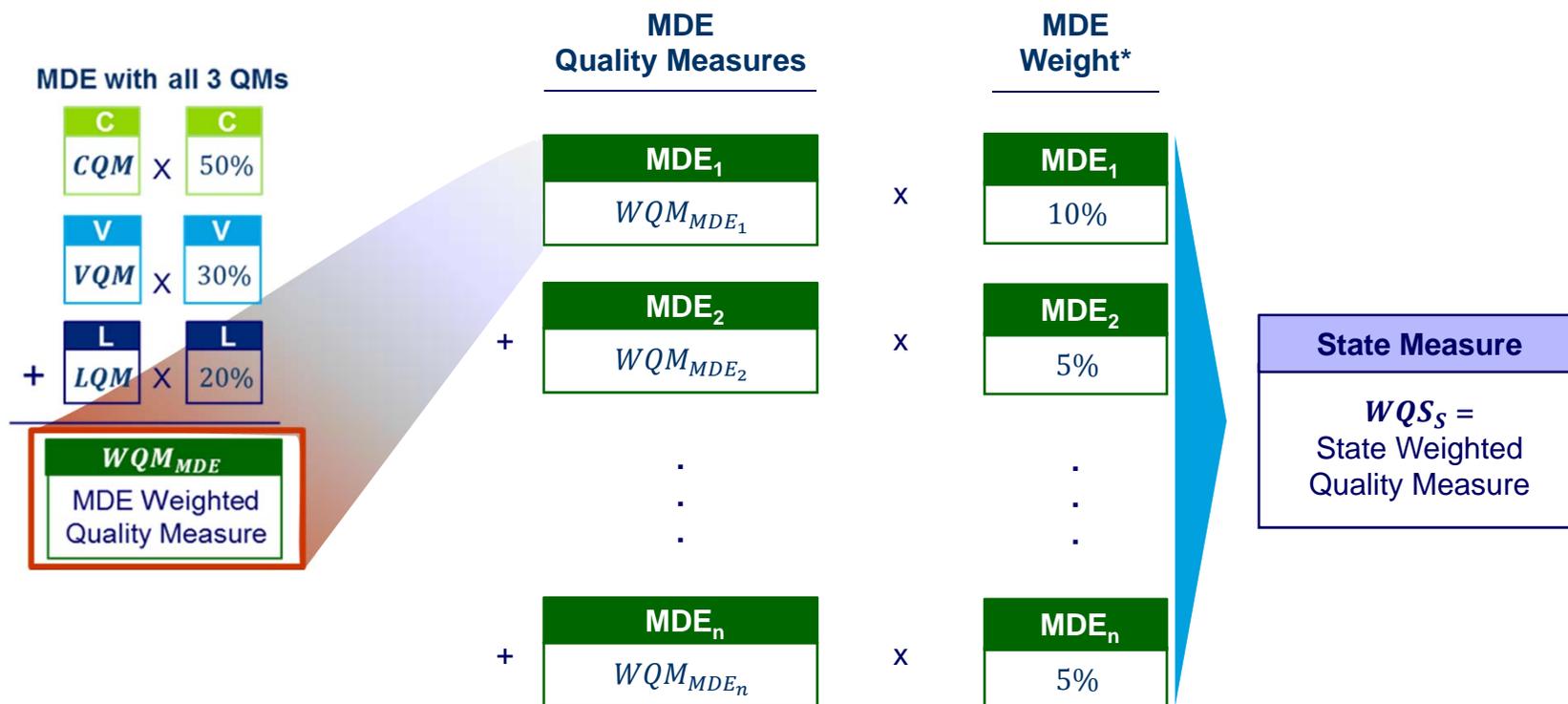
MDE with all 3 QMs	MDE with 2 QMs	MDE with 1 QM
$ \begin{array}{l} \begin{array}{ c } \hline C \\ \hline CQM \\ \hline \end{array} \times \begin{array}{ c } \hline 50\% \\ \hline \end{array} \\ + \\ \begin{array}{ c } \hline V \\ \hline VQM \\ \hline \end{array} \times \begin{array}{ c } \hline 30\% \\ \hline \end{array} \\ + \\ \begin{array}{ c } \hline L \\ \hline LQM \\ \hline \end{array} \times \begin{array}{ c } \hline 20\% \\ \hline \end{array} \\ \hline \end{array} $	$ \begin{array}{l} \begin{array}{ c } \hline C \\ \hline CQM \\ \hline \end{array} \times \begin{array}{ c } \hline 60\% \\ \hline \end{array} \\ + \\ \begin{array}{ c } \hline V \\ \hline VQM \\ \hline \end{array} \times \begin{array}{ c } \hline 40\% \\ \hline \end{array} \\ \hline \end{array} $	$ \begin{array}{l} \begin{array}{ c } \hline C \\ \hline CQM \\ \hline \end{array} \times \begin{array}{ c } \hline 100\% \\ \hline \end{array} \\ \hline \end{array} $
<div style="border: 1px solid black; padding: 5px; text-align: center;"> WQM_{MDE} MDE Weighted Quality Measure </div>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> WQM_{MDE} MDE Weighted Quality Measure </div>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> WQM_{MDE} MDE Weighted Quality Measure </div>
<p>Birth Date</p> <p><u>Complete</u> – How many times is the field filled out</p> <p><u>Valid</u> – How many times is it in MM/DD/YYYY format</p> <p><u>Logical</u> – How many times is the birthdate before the enrollment date?</p>	<p>Student State Identifier</p> <p><u>Complete</u> – How many times is the field filled out</p> <p><u>Valid</u> – How many times is it any combination of letters and/or numbers of 15 digits or less that will uniquely retrieve only one child in the State</p>	<p>First Name</p> <p><u>Complete</u> – How many times is the field filled out</p>

References:

- IBM InfoSphere Information Analyzer > [Data quality methodology Methodologies for Data Quality Assessment and Improvement](#) (Academic methodology)
- [Eurostat – Handbook on Data Quality Assessment Methods and Tools](#)

State Weighted Quality Measure

In order to address more impactful MDEs, a weight will be applied to each MDE when calculating a State's Weighted Quality Measure. These measures roll-up into a baseline measure of data quality for each State called the State WQM.



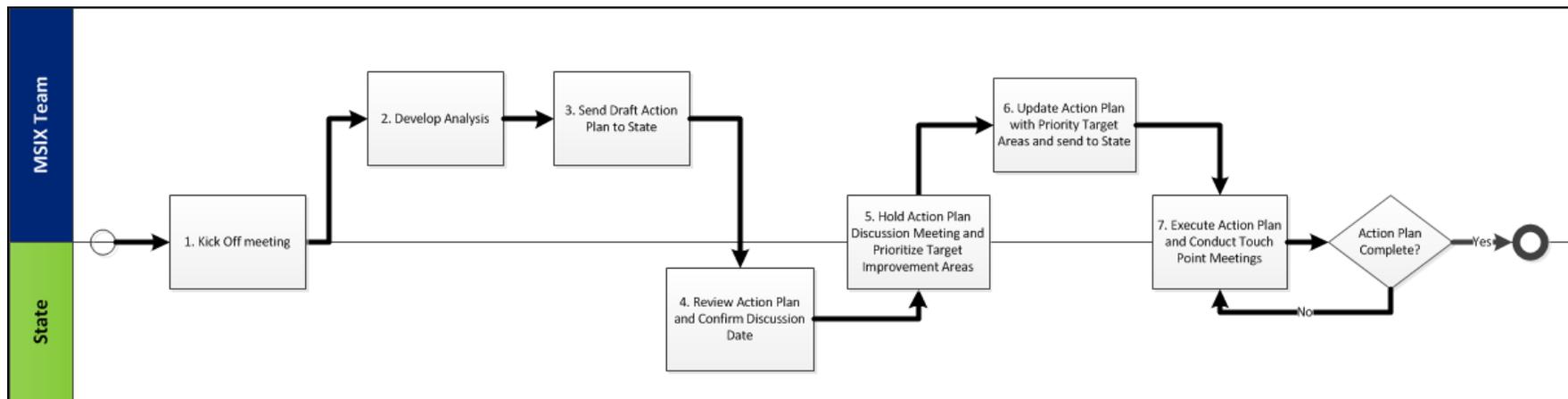
$$WQS_S = (WSQ_{MDE_1}) \times (Wt_{MDE_1}) + \dots + (WSQ_{MDE_n}) \times (Wt_{MDE_n})$$

* Weights per MDE are variable based on the MDEs scope across selected focus areas.

OME-State Engagement and Action Plan

OME-State Engagement Process

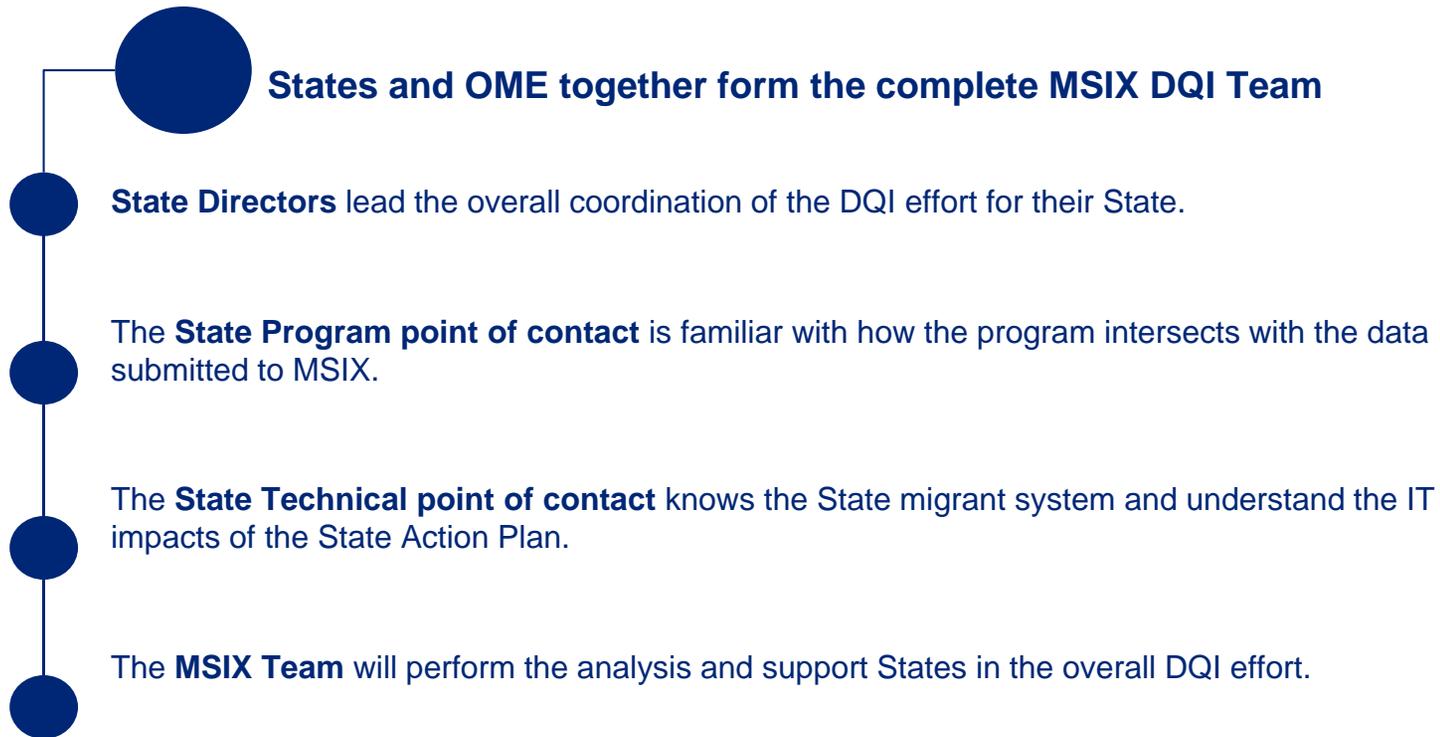
The MSIX Team will perform the majority of the analysis of data quality and States will validate findings. The collaboration between OME and States will result in clear guidance to improve data quality for both State systems and MSIX.



1. Kick Off Meeting
2. Develop Analysis
3. Send Draft Action Plan
4. Review Action Plan and Confirm Discussion Date
5. Hold Action Plan Discussion Meeting and Prioritize Target Improvement Areas
6. Update Action Plan with Priority Target Areas and send to State
7. Execute Action Plan and Conduct Touch Point Meetings

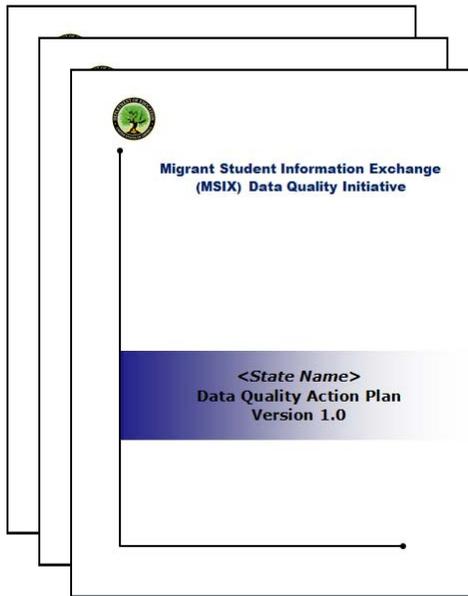
Suggested Roles and Responsibilities for OME-State Engagement

States and the MSIX Team will collaborate closely in addressing data quality target areas.



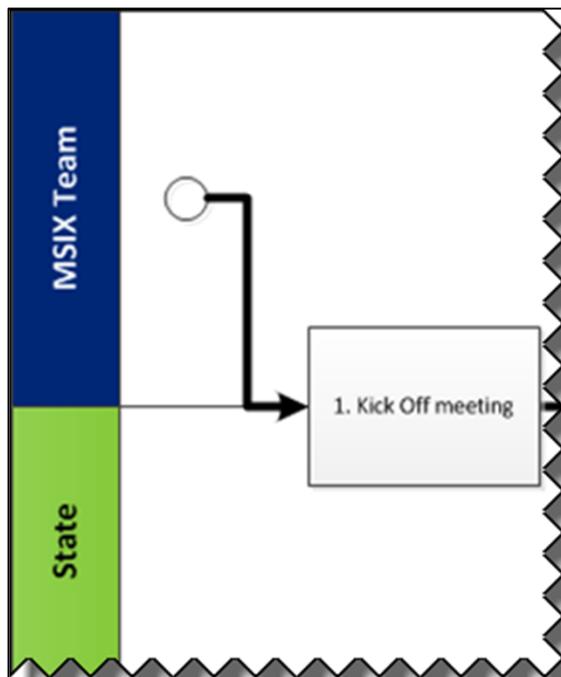
OME-State Engagement Action Plan

The State engagement process utilizes an action plan to track progress. Through out the planning stages of DQI, the action plan will be populated with information from MSIX and verified by the States. Then during the execution phases the document will be owned by the State to provide status.



OME-State Engagement Walkthrough: Kick Off Meeting

The kick-off meeting is an opportunity for stakeholders to establish expectations, and make other parties aware of timelines.



MSIX Team

- Review timeline for DQI Process
- Explain stakeholder roles and responsibilities

State

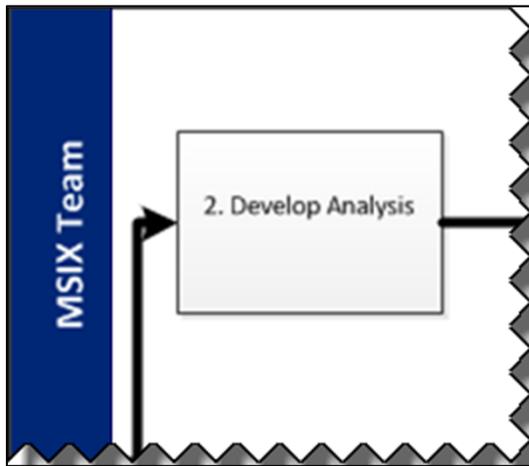
- Provide MSIX Team with technical and program point of contacts
- MSIX Team and State agree on timing for process steps

Both

- Agree on timing for process steps

OME-State Engagement Walkthrough: Develop Analysis

MSIX Team prepares the initial action plan version with generated DQI measures.



MSIX Team

- Provide an initial draft the action plan (analysis, risks, and assumptions)
- Schedule a placeholder date for the initial action plan discussion

Output of MDE Measures for “State A”

Summary statistics available in the action plan will show a high level data quality view for a State.

2.1 Data Quality Measures Summary

The following are the summary measures of data quality for <State Name> as of March 26, 2014.

Existing Issue	Baseline Measure
State Weighted Quality Measure	89.43%
State Weighted Quality Measure Ranking (Lowest to Highest)	8
CSPR Category 1 and 2 CSPR (2011-2012)	34,852
Percentage of National CSPR Total	2.4%
Completeness Measure	82.57%
Validity Measure	98.59%
Logic Measure	68.57%

OME-State Engagement Walkthrough: Develop Analysis

MSIX Team Provides Analysis for each of the Data Quality Measures in the initial action plan.

2.2 Analysis Detail: Completeness

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MDE	% Missing	# Not Complete	# Total	Notes
Birth Date	100.00%	5,384	5,384	
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Withdrawal Date	63.78%	4,098	6,425	
Grade-to-Date	63.78%	4,098	6,425	
Residency Date	100.00%	30,396	30,396	

2.3 Analysis Detail: Validity

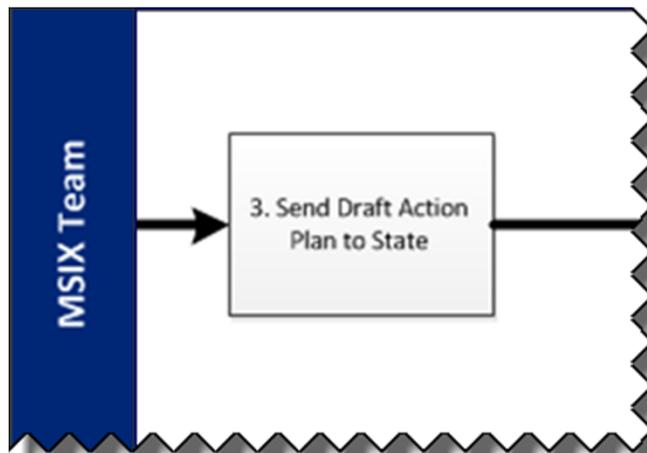
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2.4 Analysis Detail: Logic

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OME-State Engagement Walkthrough: Draft Action Plan

After completing the initial analysis, the MSIX team will generate the first draft of the action plan and send it with a meeting invitation to discuss with the State.

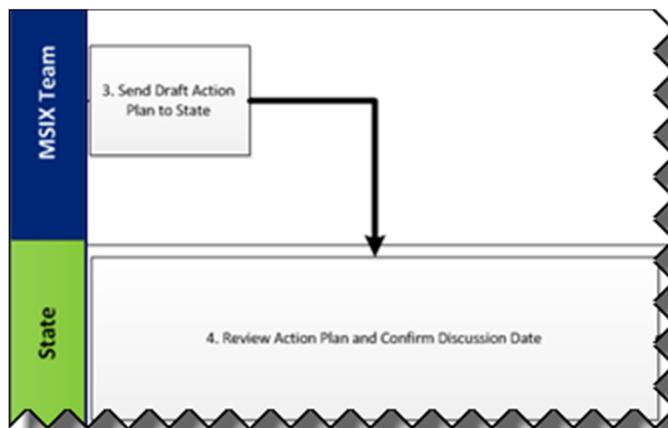


OME

- Send State the draft action plan
- Schedule action plan follow-up discussion

OME-State Engagement Walkthrough: Review Action Plan

The MSIX Team has allowed time for the review of the draft action plan by the States. The State will review the plan's findings, identify root causes, and provide context for assumptions and constraints. The State may also propose an alternative discussion meeting date.



State

- Validate contact information, existing issues, assumptions, and general constraints
- Confirm initial analysis
- Return action plan to MSIX team for review
- Confirm follow-up discussion date

OME

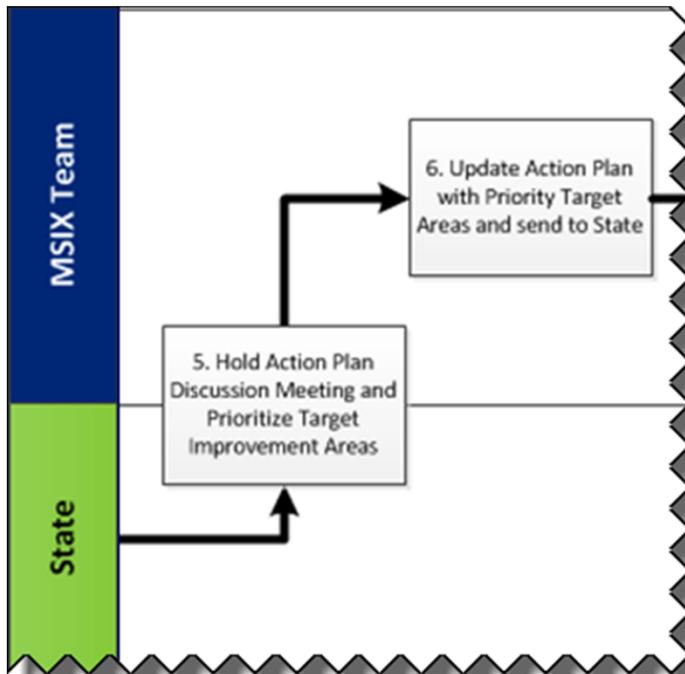
- Update Standards and Measures Document as needed

2.2 Analysis Detail: Completeness

MSIX Team Analysis					State POC Response	
MDE	% Missing	# Not Complete	# Total	Notes	Agree / Disagree	Notes
Continuation of Services	100.00%	5,384	5,384		Disagree	Not Currently part of collection Efforts
Final Grade	100.00%	67,835	67,835		Agree	Not captured by Vendor system
Residency Date	100.00%	4,352	4,352		Agree	Not captured by Vendor system

OME-State Engagement Walkthrough: Discuss and Finalize Action Plan

The discussion meeting will result in a final action plan which includes all explicit findings, assumptions, constraints, discovered root causes, and time frames for addressing priority areas.

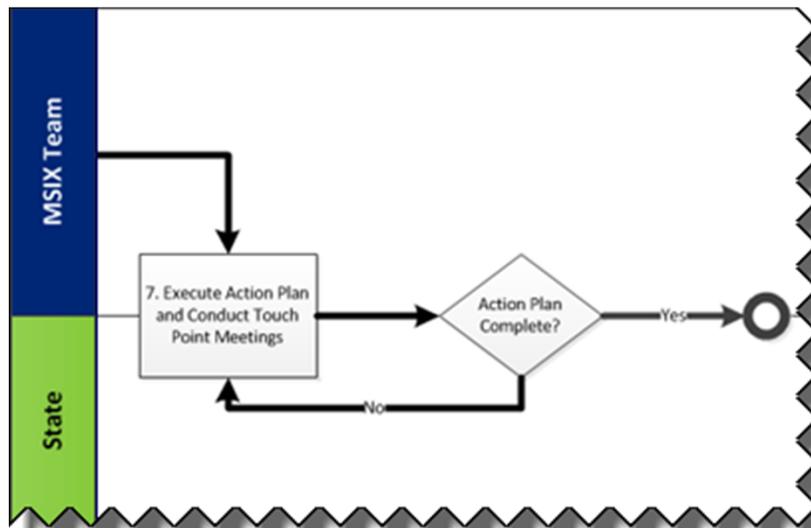


OME & State

- Agree on analysis and conclusions
- Agree on priorities for action plan
- Review the timeline for the action plan's execution with the State

OME-State Engagement Walkthrough: Execute Action Plan and Conduct Touch Points

All stakeholders execute their agreed upon roles, and data quality improvements are compared against the action plan.



OME

- Update the action plan from the discussion meeting (Step 5)
- Provide technical guidance, check for updates, and support testing for State

State

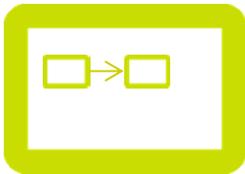
- Execute Data Quality Action Plan

Date	Action Item	Comments
7/30/14	Improve collection process of completing COE	Made electronic fields mandatory. Working on incorporating changes to business processes.

Next Steps for States

If you are a DQI pilot participant then you have heard from us. If you're not one of the invited States, please note that the Data Quality Initiative selection is not final and spots remain available for the Pilot. If you are not part of the Pilot phase these are some things for you to consider to follow the DQI process:

Adjust Processes



The MSIX team will adjust the DQI process based upon State feedback.

Identify State and MSIX Resources



Explain stakeholder roles and responsibilities.

Prepare Technical Resources



Socialize webinar content with appropriate contacts.

Summary

- Reviewed the context of the MSIX DQI and the drivers to renew the effort
- Explained the science of quantifying data quality within MSIX
- Step-by-step walkthrough of the State engagement process
- Reviewed the sections of the State Action Plan

Question and Answer

- What is the level of effort required by the States?
- How will success of this effort be determined?
- How is the DQI different than what States have done during the MSIX interface certification process?
- When will other MDEs be covered by the DQI?
- If my State is currently not ready to participate in the MSIX DQI, what can we do in the meantime to prepare?

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