

Automating Electronic Health Record Integration

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How much can an IIS Program Handle?

- Rolling Out new IIS and Enrolling Providers
- Transitioning to new IIS Platforms
- VTrckS Integration
- EHR Integration
- Meaningful Use Management
- HIE Integration
- Meeting New Minimum Functional Standards
- And the list goes on.

Increasing Demands on Staff from Meaningful Use and EHR Interoperability Incentives

Increase in Registration Services

- Handling Incoming Requests
- Processing Forms for IIS Enrollment
- Processing Data Exchange Forms
- Prioritizing Providers
- Managing Key Contacts
- Logging Communications

Increase in Integration Services

- HL7 Message Validation and Logging
- Handling Connectivity Requests
- Data Quality (QA) Testing and Logging
- Support Issue Resolution
- Managing EHR Vendors
- Tracking EHR Adoption

Increasing Demands on Staff from Meaningful Use and EHR Interoperability Incentives

Increase in Communications

- Confirmation of Incoming Requests
- Data Exchange Requirements
- Data Exchange Profile Collection
- Messaging Specifications
- HL7 Messaging Validation Corrections
- QA Results and Corrections
- Connectivity Requirements
- etc. . .

Increase in Project Coordination

- Facilitating Collaboration
- Project Status Updates
- Policy Updates
- Internal and External Reporting
- Internal Communications
- etc. . .

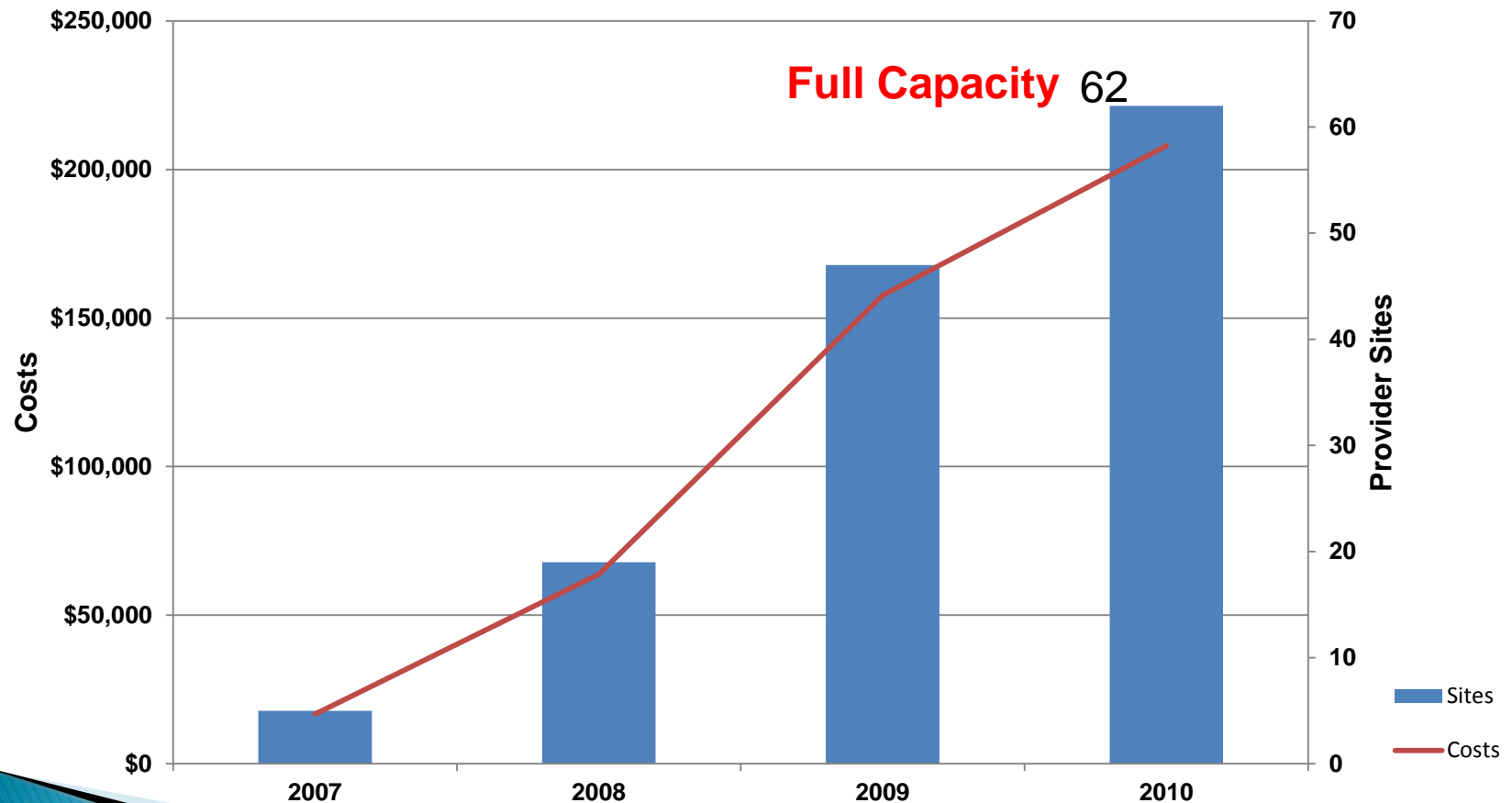
Helping Ohio meet the Demand

The Problem we Faced in Ohio

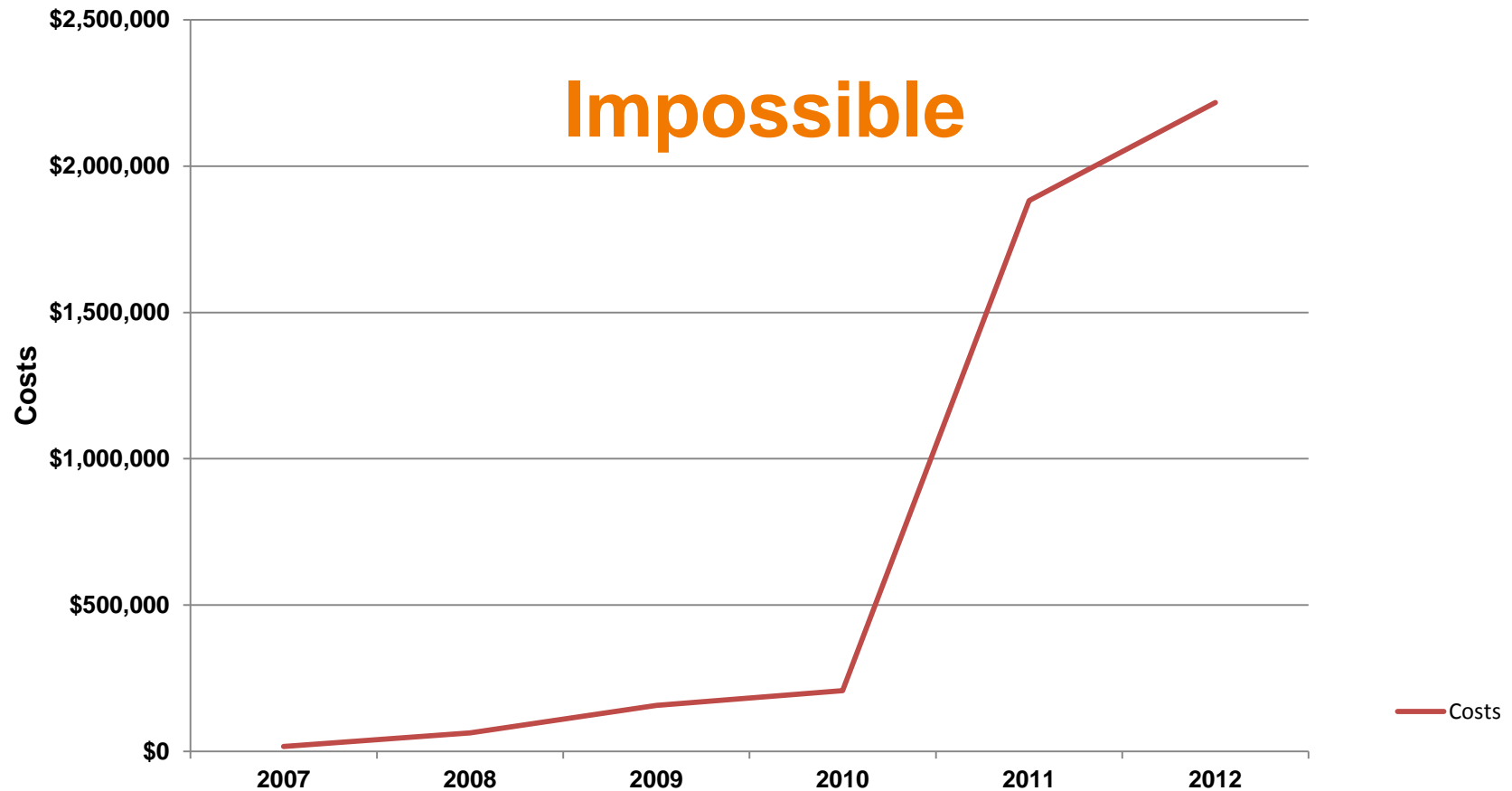
- Steady increase in EHR Integration demand.
- Current staffing was insufficient.
- Process depended on IT Staff Availability.
- Staffing Up was not an option.
- Current Integration process was not scalable.
- Quickly becoming cost prohibitive.

And the work was queuing up!

Ohio Dept of Health Costs to Enroll, Evaluate and Certify Providers using Non-scalable Process



Forecasted Costs maintaining 2010 into Process for 2011 and 2012



2 Options:

1. Continue using the current process and keep adding providers to the queue to be dealt with at a later date.

Or . . .



2. **Find a better way.**

Non-scalable Process Flow in 2010

Non-scalable Process

**Pre-Certification:
HL7 Message Validation**

Production Implementation

Connectivity Establishment

**Depends heavily on
IT Staff Availability**

**Pre-Load Validation:
Quality Assurance Testing**

Provider Enrollment

Provider Added to Queue

Meeting with Provider

Provider Sends HL7 Sample Message

Manual Validation
- Script Parsed Message
- Manual Message Inspection

Pass?

YES

NO

Correction Request Sent to Provider

Provider Site Sends Corrected Message to DPH

DPH loads sample message to IIS Test Environment

Load Success?

YES

NO

Manual Inspection to Identify Cause of Load Failure

Correction Request Sent to Provider

Weekly Meeting with Provider

YES

Pass?

NO

Code set Mapping Issues Sent to Provider

Code Set Mapping Meeting with Provider

DPH Loads Provider QA File into IIS

DPH Receives QA Test File from Provider Site

Goals

- 1. Reduce IIS Staff Involvement.**
- 2. Reduce Dependency on IT Staff in:**
 - Pre-Certification
 - Pre-Load Validation
- 3. Implement a Scalable Solution**
- 4. Make it simple**

Approach

1. Data Centralization:

Single Source to Manage and Track

- Provider Sites
- Groups (*Medical Groups, Physician Groups, Hospital Networks, etc.*)
- EHR Vendors

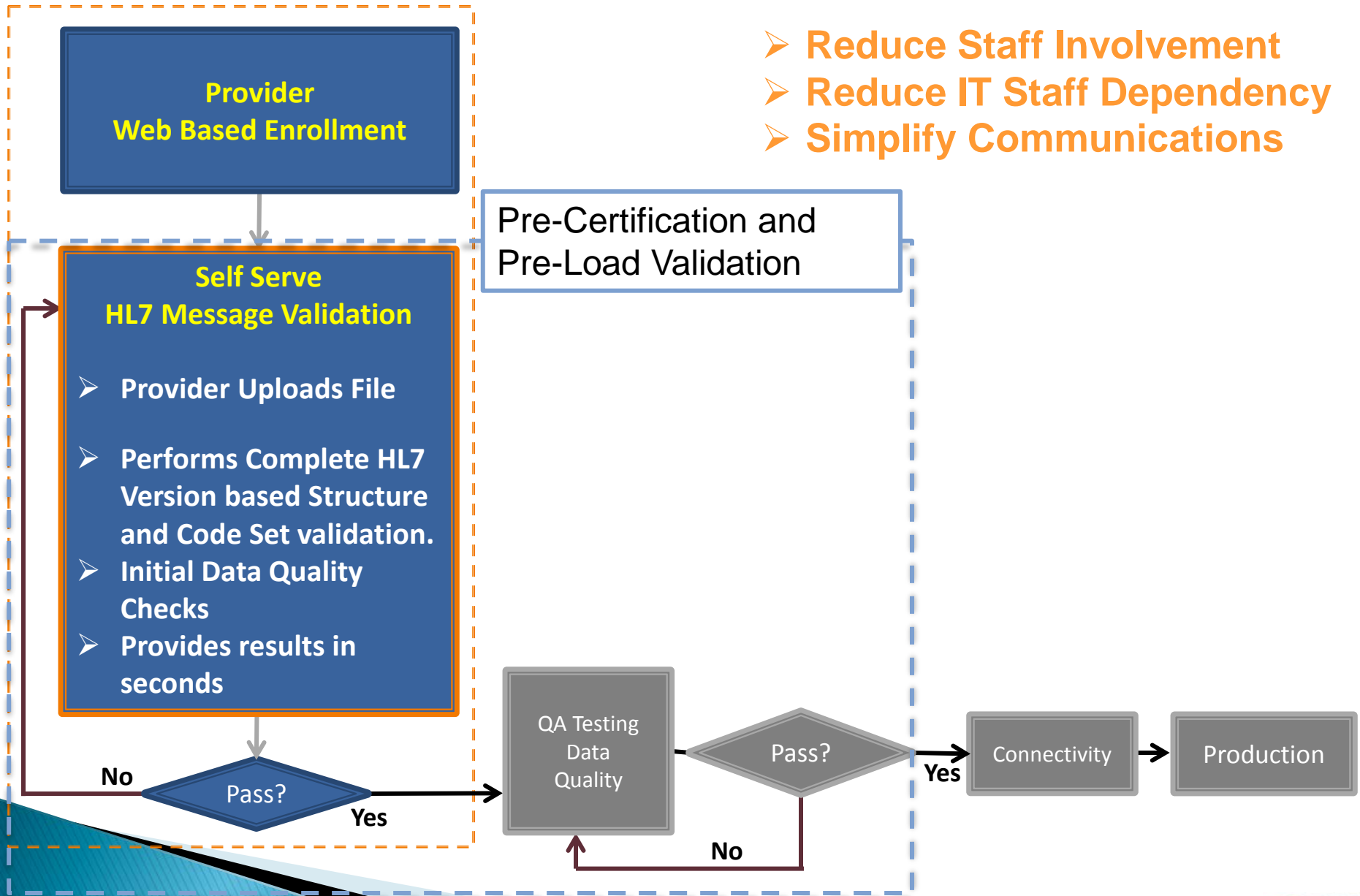
2. Secure Web-based Provider Resources

Single Source for Provider Resources

- Enrollment = Registration
- Implementation Guides, Code Set Documents, Connectivity Specifications. . .
- Self-Serve HL7 Message and Code Set Validation
- Provide Real-time Validation Results and Integration Status

3. Automate Certification Process

- Reduce Staff Involvement
- Reduce IT Staff Dependency
- Simplify Communications



Provider Web-based Enrollment

Automatic Time Saving Events

Provider Web Based Enrollment

- ✓ Notifies IIS Staff
- ✓ Sends Confirmation to Provider
- ✓ Updates Site in Central Database
- ✓ Logs Enrollment Activity
- ✓ Creates Data Exchange Profile
- ✓ Links Site to EHR and Group
- ✓ Updates Reporting Dashboards
- ✓ Increments EHR Adoption Report

Self-Serve HL7 Code Set Validation

Automatic Time Saving Events

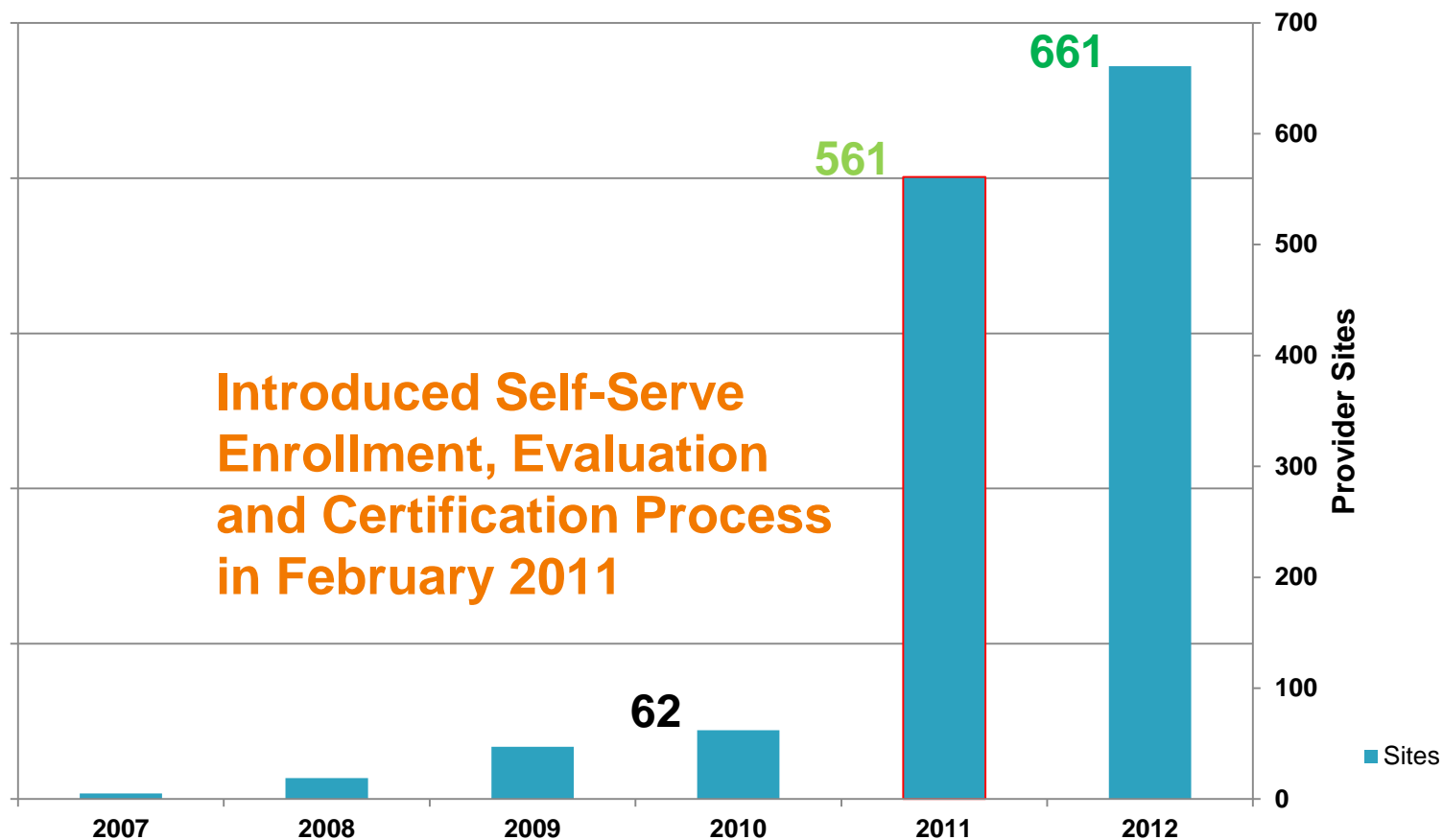
Self Serve HL7 Code Set Validation

- Provider Uploads File
- System identifies HL7 Version
- Performs Complete Code Set Evaluation
- Provides results in seconds

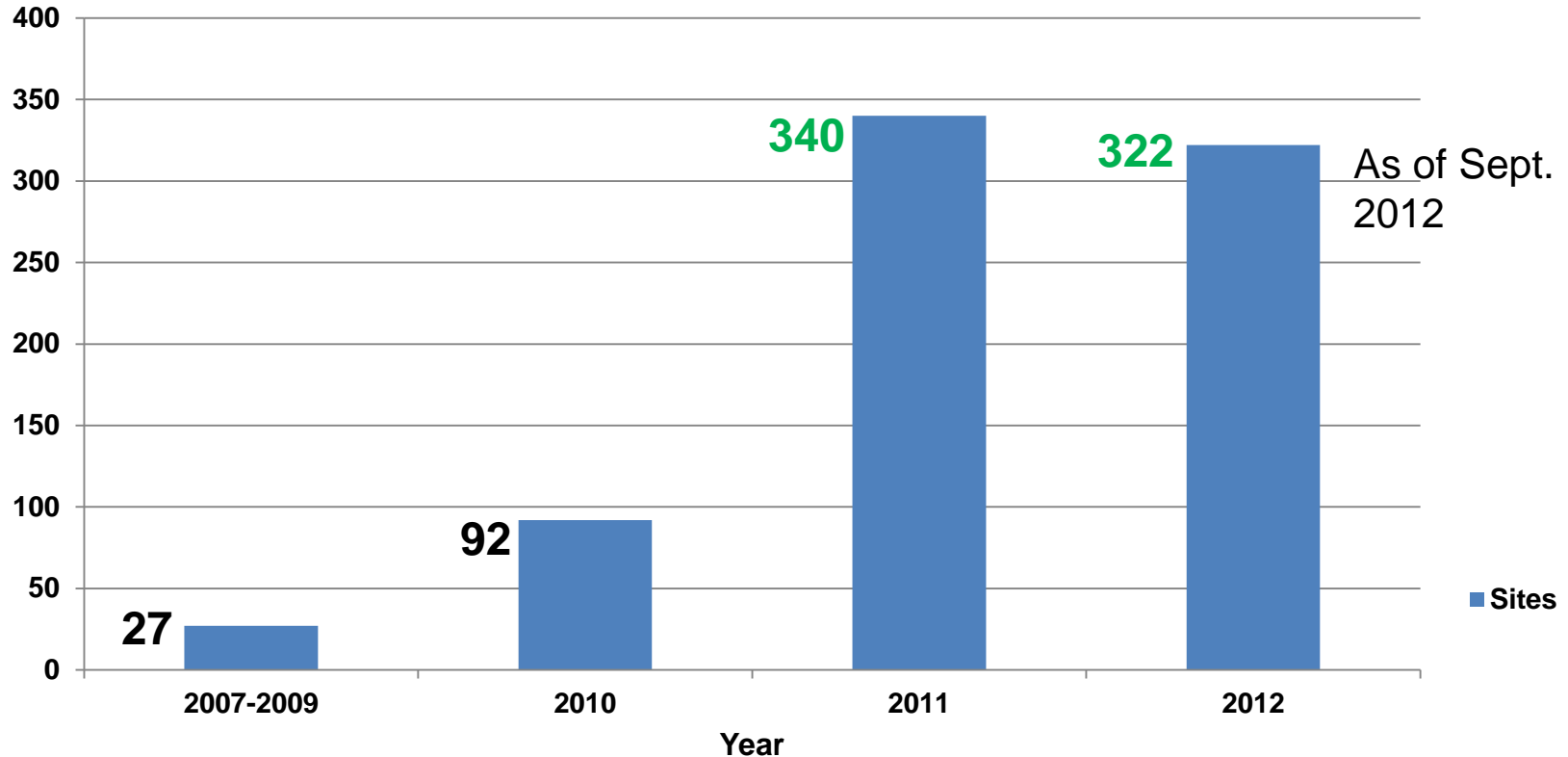
- ✓ Notifies IIS Staff
- ✓ Updates Integration Status
- ✓ Test Results captured
- ✓ Immediate Feedback to Provider
- ✓ Updates Provider HL7 Version
- ✓ Updates Reporting Dashboards

What happens when you automate the EHR Integration Process?

Ohio Providers using Self-Serve Automated Process



Integrated Sites in Ohio by Year



Total HL7 Submitting Provider Sites: 781

Scalable and **SUSTAINABLE**

Results

Did we meet our goals?

- ✓ Reduced IIS Staff Involvement
- ✓ Reduced Dependency on IT Staff
- ✓ Unlimited Providers Evaluated and Certified Concurrently (Scalable)
- ✓ Immediate results added continuity to process.
- ✓ Reduced Pre-Load Data Validation Time and Effort

What do we call this tool?

IIS Program Management Tool



Providing Increased Visibility for Streamlining an IIS Program's Daily Operations



The HL7 Validation Engine

The HL7 Code Set Validation Engine

Supports HL7 Versions: 2.3.1 - 2.5.1

Code Set Validation Enforces:

- Implementation Guide for Immunization Data Transactions using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol Implementation Guide Version 2.2
- HL7 Version 2.5.1 Implementation Guide for Immunization Messaging

And Supports

- IIS: HL7 Local Business Rule Template

The HL7 Validation Engine

What makes it Unique?

IIS Program has Full Validation Control

- Required vs Optional Validations
- Add New Validations by Segment or Code Set
- Inactivate Validations by Segment or Code Set

Message Structure Validation

- Field Separators
- Encoding Characters

Goes Beyond Message Structure Validation

- Validates Completeness and Correctness of HL7 Code Set
- Presence of Required Code Sets
- Code Set Validation check for correctness of Code Value

Field Value Validation

- Validates for presence of value
- Validates for correct data format content

HL7 Code Set Validation Engine

2012 Updates

Validates Code Set for Unidirectional and Bidirectional Submissions

- 2.3.1 VXU and VXQ
- 2.5.1 VXU and QBP

Batch File Validations for Single File Multiple Site Submissions

- Service Identifies Sending Facility in File
- Updates Validation Attempt and Results in Central Database per Sending Facility (Provider)

Automated Quality Check for CVX, CPT and MVX code match


- Validates Presence and Correctness of CVX Code
- Validates Presence and Correctness of CPT Code
- Validates Presence and Correctness of MVX Code
- Validates CVX=CPT=MVX match.

HL7 Code Set Validation Results


Immediate Feedback to Provider

#	Segment	Field Name	Validation	Value	Status
1.	MSH1	Field separator	Is Required.	See Value	✓
2.	MSH1	Field separator	Content of this field is valid.	See Value	✓
3.	MSH2	Encoding characters	Is Required.	See Value	✓
4.	MSH2	Encoding characters	Content of this field is valid.	See Value	✓
5.	MSH4	Sending facility	Is Required.	See Value	✓
6.	MSH4	Sending facility	Content of this field is valid. Is in format KS1234 where 1234 is registry assigned practice ID of the site.	See Value	✗
7.	MSH7	Date/Time of message	Validated for correct date format.	See Value	✓
8.	MSH9	Message type	Is Required.	See Value	✓
9.	MSH9	Message type	Content is validated for the supported Message Type.	See Value	✓
10.	MSH10	Message control ID	Is Required.	See Value	✓
11.	MSH11	Processing ID	Is Required.	See Value	✓
12.	MSH12	Version ID	Is Required.	See Value	✓
13.	MSH12	Version ID	Version is validated for the supported HL7 version.	See Value	✓
14.	PID3	Patient identifier list	Is Required.	See Value	✓
15.	PID3	Patient identifier list	Identifier type is validated for supported version.	See Value	✗


CVX=CPT=MVX Code Match? Results

6.	RXA5	Administered code	CPT Code is not blank.	
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Value Sent: 20^DTAP^CVX

7.	RXA5	Administered code	Content validated for the correctness of the CPT Code set.	
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Value Sent: 20^DTAP^CVX

8.	RXA5	Administered code	Content validated for the correctness of the CPT Code Type as C4	
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Value Sent: 20^DTAP^CVX

9.	RXA5	Administered code	CPT Code should match with CVX Code	
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Value Sent: 20^DTAP^CVX

10.	RXA5,RXA17	Administered/Manufacturer Code	CPT Code should match with MVX Code	
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Value Sent: PMC^PASTEUR MERIEUX CONNAUGHT^MVX

11.	RXA5	Administered code	CPT Code is not blank.	
-----	------	-------------------	------------------------	--

Value Sent: 03^MMR^CVX









12.	RXA5	Administered code	Content validated for the correctness of the CPT Code set.	
-----	------	-------------------	--	---

Value Sent: 03^MMR^CVX

13.	RXA5	Administered code	Content validated for the correctness of the CPT Code Type as C4	
-----	------	-------------------	--	---

Value Sent: 03^MMR^CVX

Tell Them what they have to Fix!

#	Segment	Field Name	Validation	Status
1.	MSH4	Sending facility	Content of this field is valid. Is in format KS1234 where 1234 is registry assigned practice ID of the site.	
Value Sent: MA0000				
2.	PID10	Race	Content validated for the correctness of the HL7 Code set.	
Value Sent: 2106-3^WHITE^HL70005				
3.	PID24	Multiple birth indicator	Content validated for the correctness of the HL7 Code set.	
Value Sent: 12				
4.	NK14	Address	Either address or phone number is required.	
Value Sent:				
5.	NK14	Address	Validated for completeness of the address. Address Line1, City, State and Zip.	
Value Sent:				
6.	NK14	Address	Either address or phone number is required.	
Value Sent:				
7.	NK14	Address	Validated for completeness of the address. Address Line1, City, State and Zip.	
Value Sent:				
8.	RXA10	Administering	Is Required.	

HL7 Code Set Validation Results

Streamlining Communications

Immediately shared among stakeholders:



IIS Staff View of Provider EHR Integration Profile

EHR Profile >>

Provider Site Information

County	Provider Site	Address	Phone #
OSAGE	AMCI Pediatrics INC	700 W. 7TH , Overbrook, KS 66524	(785) 464 6666

Summary Information

IDE PreCertification	Connectivity	QA Status	Production Date
VXU: VXQ: QBP:			09 20 2012

Associated With Projects

- [4480 - AMCI Medical Group Project 1](#)

Vendor Information

Vendor	Product/Version	Supported HL7 Version
CareTech Solutions Inc	iDoc - 5.5	2.5.1

Data Exchange Profile

Practice Contact	Vendor Contact	Other Contact
Darrin Rosebrook:Office Manager	Frank Carey	Darrin Rosebrook:Office Manager

Will Data be sent to the IIS via a bridge, such as an Aggregation Point or Hospital Network? ☒ Yes ☐ No

Bridge Type/Bridge Name Medical Groups - AMCI Medical Group

Data Exchange Integration Status

IDE HL7 Messaging Evaluation

Message Type	Last Evaluation	Summary	HL7 Version	Status	Detail
VXU	09 17 2012	Errors: 0 Warnings: 0	2.5.1		View
		VXQ evaluation has not been started.			
QBP	09 17 2012	Errors: 0 Warnings: 0	2.5.1		

Quality Assurance (QA) Testing

File Submission Date	Date Added to Queue	QA Test Date	Detail	Status
09 /17 /2012	09 /18 /2012	09 /19 /2012	View	Pass

[Submit New QA Test File](#)

Connectivity

Mode of Connectivity	Data Exchange Mode	Data Exchange Type	Frequency
Web Service/SOAP	Both	Synchronous Any	Weekly
Connectivity Requested	Connectivity Info Sent	Connectivity Established	Validation
09 /17 /2012	09 /19 /2012	09 /20 /2012	Pass
Submit Connectivity Request:	Send Request	Send C&V Instructions:	Send C&V Instructions

Production

Initial Submission	Receipt Confirmation	Initial Load Date	Completion Date
09 /20 /2012	09 /20 /2012	09 /20 /2012	09 /20 /2012

IIS Staff View of Provider EHR Integration Profile

- Quick View **Integration Status**
- Associated **Integration Projects**
- **EHR Vendor** Details
- **Key Contacts**
- **Group Association**
For Batch Submissions

EHR Profile >>			
Provider Site Information			
County	Provider Site	Address	Phone #
OSAGE	AMCI Pediatrics INC	700 W. 7TH , Overbrook, KS 66524	(785) 464 6666
Summary Information			
IDE PreCertification	Connectivity	QA Status	Production Date
VXU: VXQ: QBP:			09 20 2012
Associated With Projects			
<ul style="list-style-type: none">• 4480 - AMCI Medical Group Project 1			
Vendor Information			
Vendor	Product/Version	Supported HL7 Version	
CareTech Solutions Inc	iDoc - 5.5	2.5.1	
Data Exchange Profile			
Practice Contact	Vendor Contact	Other Contact	
Darrin Rosebrook:Office Manager	Frank Carey	Darrin Rosebrook:Office Manager	
Will Data be sent to the IIS via a bridge, such as an Aggregation Point or Hospital Network? <input checked="" type="radio"/> Yes <input type="radio"/> No			
Bridge Type/Bridge Name		Medical Groups - AMCI Medical Group	

IIS Staff View of Provider EHR Integration Profile

- HL7 Code Set **Validation Summary** by message Type
- QA **Key Dates**
- QA **Status Tracking**

Data Exchange Integration Status					
HL7 Messaging Evaluation					
Message Type	Last Evaluation	Summary	HL7 Version	Status	Detail
VXU	09 17 2012	Errors: 0 Warnings: 0	2.4		View
VXQ evaluation has not been started.					
QBP	09 17 2012	Errors: 0 Warnings: 0	2.5.1		
Quality Assurance (QA) Testing					
File Submission Date	Date Added to Queue	QA Test Date	Detail	Status	
09 / 17 / 2012	09 / 18 / 2012	09 / 19 / 2012	View	Pass ▾	
<div>Submit New QA Test File</div>					

IIS Staff View of Provider EHR Integration Profile

Data Exchange Details

- Mode of Connectivity
- Data Exchange Mode
- Data Exchange Type
- Frequency

Connectivity Details

- Key Dates
- Validation Results
- Status

Connectivity				
Mode of Connectivity	Data Exchange Mode	Data Exchange Type	Frequency	
Web Service/SOAP ▾	Both ▾	Synchronous Any ▾	Weekly ▾	
Connectivity Requested	Connectivity Info Sent	Connectivity Established	Validation	Status
09 / 17 / 2012	09 / 19 / 2012	09 / 20 / 2012	Pass ▾	Established ▾
Submit Connectivity Request:	<button>Send Request</button>	Send C&V Instructions:	<button>Send C&V Instructions</button>	

IIS Staff View of Provider EHR Integration Profile

Production Implementation

- Scheduling
- Status

Production			
Initial Submission	Reciept Confirmation	Initial Load Date	Completion Date
09 / 20 / 2012	09 / 20 / 2012	09 / 20 / 2012	09 / 20 / 2012

Pre-Certification Summary Dashboard

Real-time Provider HL7 Code Set Validation Activity Summary

Display by:

Single Site

Filter:

All

By Status

From Date

To Date

Display

Print

Pre-Certification Summary

#	Provider Site	Electronic Health Record	HL7 Version	Start Date	Last Evaluation	Evaluation Status	Export	View History
1.	1 Bas Clinic	ABEL Medical Software Inc/ABELMed EHR EMR / PM/11	2.4	09 16 2012	09 17 2012		Export	View
2.	AMCI Free Clinic	CareTech Solutions Inc/iDoc/5.5	2.5.1	09 15 2012	09 15 2012		Export	View
3.	AMCI Free Clinic	CareTech Solutions Inc/iDoc/5.5						View
4.	AMCI Geriatrics	American Medical Software/American Medical Software/EMR 22	2.4	09 16 2012	09 16 2012		Export	View
5.	AMCI Pediatrics INC	CareTech Solutions Inc/iDoc/5.5	2.3.1	09 07 2012	09 07 2012		Export	View
6.	AMCI Pediatrics INC	CareTech Solutions Inc/iDoc/5.5						View
7.	Immunization Clinic 1	Allscripts/Allscripts ED Version/7						View
8.	Immunization Clinic 2	Allscripts/Allscripts ED/6.3 Service Release 4	2.5.1	09 17 2012	09 17 2012		Export	View

IIS Data Submission Monitor

Sustaining High Quality Submissions






Automatic Notifications are sent when submission integrity is compromised.

✓ Alert IIS Program

✓ Alerts Provider Site

IIS Data Submission Monitor

powered by OverSight ©

#	IIS ID	Provider Site	Electronic Health Record (EHR)	HL7 Version	File Date	Rejection Rate	Alert
1.	1233	1 Bas Clinic	ABEL Medical Software Inc/ABELMed EHR EMR / PM/11	2.3.1	09 01 2012	3	
2.	1876	AMCI Free Clinic	CareTech Solutions Inc/iDoc/5.5	2.5.1	09 14 2012	1	
3.	3333	AMCI Geriatrics	American Medical Software/American Medical Software/EMR 22	2.5.1	09 07 2012	100	
4.	1234	AMCI Pediatrics INC	CareTech Solutions Inc/iDoc/5.5	2.5.1		N/A	N/A
5.	9090	AMCI Practice 1	BackChart/BackChart/COS 1.08	2.3.1	08 30 2012	9	
6.	1234	Immunization Clinic 1	Allscripts/Allscripts ED Version/7			N/A	N/A
7.	8888	Immunization Clinic 2	Allscripts/Allscripts ED/6.3 Service Release 4	2.5.1	09 14 2012	7	



Innovative Solutions for Immunization Information Systems

**Frees Up IIS Staff to Focus on
Data Accuracy and Quality.**

**Let the system do it for you
and take the credit for a job
well done!**

For More Information . . .

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