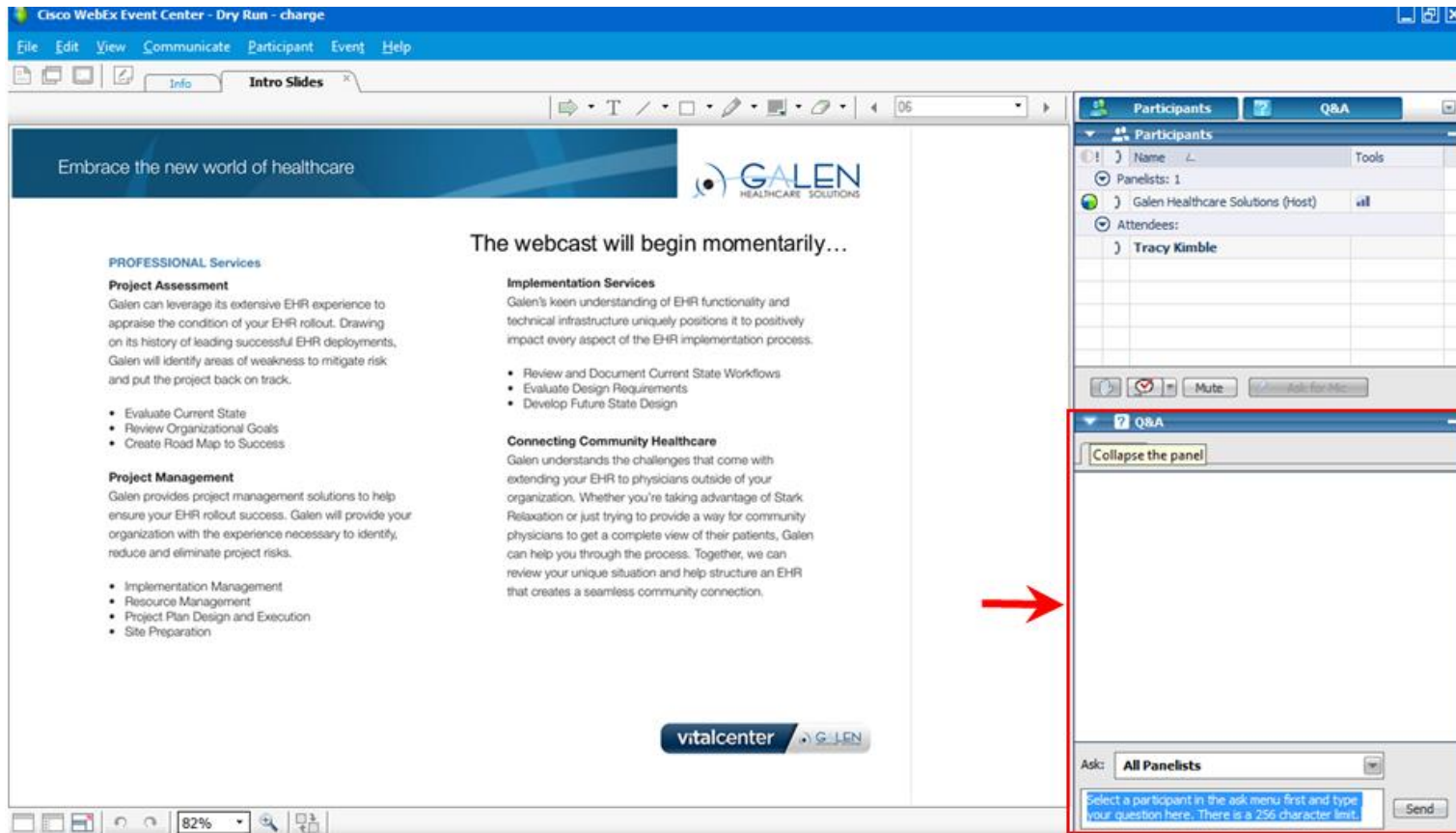


Your phone has been automatically muted. Please use the Q&A panel to ask questions during the presentation!



The screenshot shows a Cisco WebEx Event Center window titled "Cisco WebEx Event Center - Dry Run - charge". The main presentation area displays a slide with the title "Embrace the new world of healthcare" and the Galen Healthcare Solutions logo. The slide content is divided into three sections: "PROFESSIONAL Services", "Implementation Services", and "Connecting Community Healthcare".

PROFESSIONAL Services

Project Assessment

Galen can leverage its extensive EHR experience to appraise the condition of your EHR rollout. Drawing on its history of leading successful EHR deployments, Galen will identify areas of weakness to mitigate risk and put the project back on track.

- Evaluate Current State
- Review Organizational Goals
- Create Road Map to Success

Project Management

Galen provides project management solutions to help ensure your EHR rollout success. Galen will provide your organization with the experience necessary to identify, reduce and eliminate project risks.

- Implementation Management
- Resource Management
- Project Plan Design and Execution
- Site Preparation

Implementation Services

Galen's keen understanding of EHR functionality and technical infrastructure uniquely positions it to positively impact every aspect of the EHR implementation process.

- Review and Document Current State Workflows
- Evaluate Design Requirements
- Develop Future State Design

Connecting Community Healthcare

Galen understands the challenges that come with extending your EHR to physicians outside of your organization. Whether you're taking advantage of Stark Relaxation or just trying to provide a way for community physicians to get a complete view of their patients, Galen can help you through the process. Together, we can review your unique situation and help structure an EHR that creates a seamless community connection.

The webcast will begin momentarily...

Participants

Name	Tools
Panelists: 1	
Galen Healthcare Solutions (host)	
Attendees:	
Tracy Kimble	

Q&A

Collapse the panel

Ask: All Panelists

Select a participant in the ask menu first and type your question here. There is a 256 character limit.

Send

HL7 Fundamentals

Presented by: Kim Tremblay

February 2014

Welcome

- Background of HL7
- How does it work?
- Messages
 - Common message types
- Trigger Events
- Segments
 - Common segments
 - Repeating segments
- Delimiters
- Sample Message
- ACK and NACK
- Data Exchange Standards
- Future of HL7
- Steps to Successful Interface Development
- Q&A

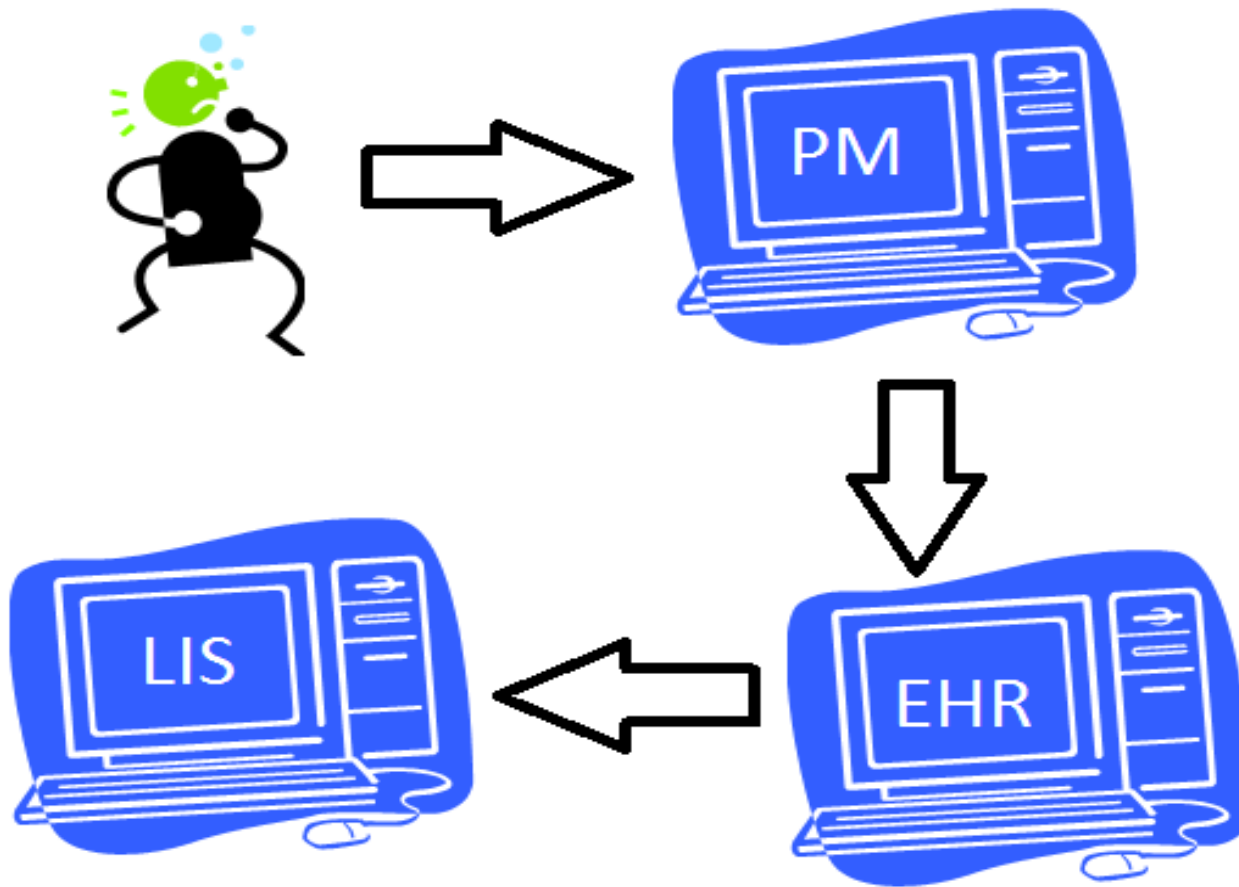
What is HL7?

- Founded in 1987
- Health Level Seven (HL7) is an application protocol for exchanging healthcare data among different applications.
- The HL7 protocol is a collection of standard formats that support the implementation of interfaces between computer applications and different vendors.
- HL7's purpose is to facilitate communication and sharing of data in healthcare settings.
- The primary goal is to eliminate or substantially reduce the custom interface programming and program maintenance that may otherwise be required.

What is HL7?

- HL7 provides a method for disparate systems to communicate clinical and administration information in a normalized format with acknowledgement of receipt.
- HL7 was created as a framework for negotiation to enable independent systems to communicate with one another.
- Highly adaptable
- Allows many different types of systems to communicate via a base format

How does it work?



Messages

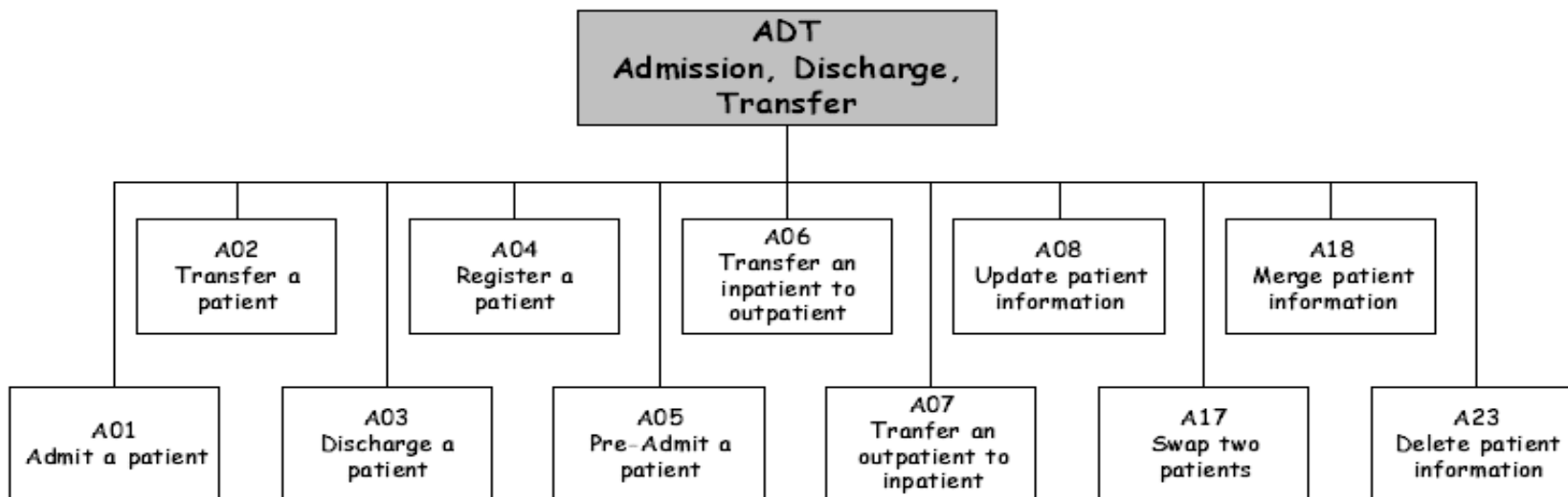
- Messages are the base format used for all HL7 communication
- Every message contains:
 - Message type
 - Segments
 - Fields
- Trigger event initiates an exchange of messages

Most Common Message Types

- ADT (Registering, admitting, updating, or discharging a patient)
- SIU (Scheduling)
- ORM (Order)
- ORU (Result)
- DFT (Charge)
- MFN (Dictionary updates)
- ACK (Acknowledgement)

Trigger Events

- Each HL7 transaction set supports many different types of activities.
- These activities are referred to as 'events'.
- An event is used to identify what triggered the creation of the HL7 message.
- Quite often, an application that receives HL7 messages will use the event to identify how the data should be used by the application.



Segments

- Logical grouping of data fields
- May be required or optional
- There are over 120 types of segments that can be sent
- Each segment is given a name and three-character code
 - Example: Message Header (MSH), Event Type (EVN), Patient ID (PID)

Segments



MSH|^~\&|AHSADT|AHS|SMSADT|SMS|201312271400|SECURITY|ADT^A01|MSG00001|P|2.3.1|

EVN|A01|201312271400||.

PID|||565256^^^GENHOS^MR~555-55-5625^^^USSA^SS|253763|DOE^JOHN||19760306|M|||276 EAST^^ALBANY^NY^12061^USA|| (518)252-5344|

Common Segments

- MSH - Message Header
information about a message
- EVN - Event Type
event information
- PID - Patient Identification
information about a patient
- NK1 - Next of Kin
information about the patient's other related parties
- OBR - Observation Request
information about an order
- OBX - Observation Report
information about a result

Repeating Segments

- Some segments such as OBX, NTE, or NK1 can be repeating
- An example is the NK1 segment which shows the next of kin/associated parties

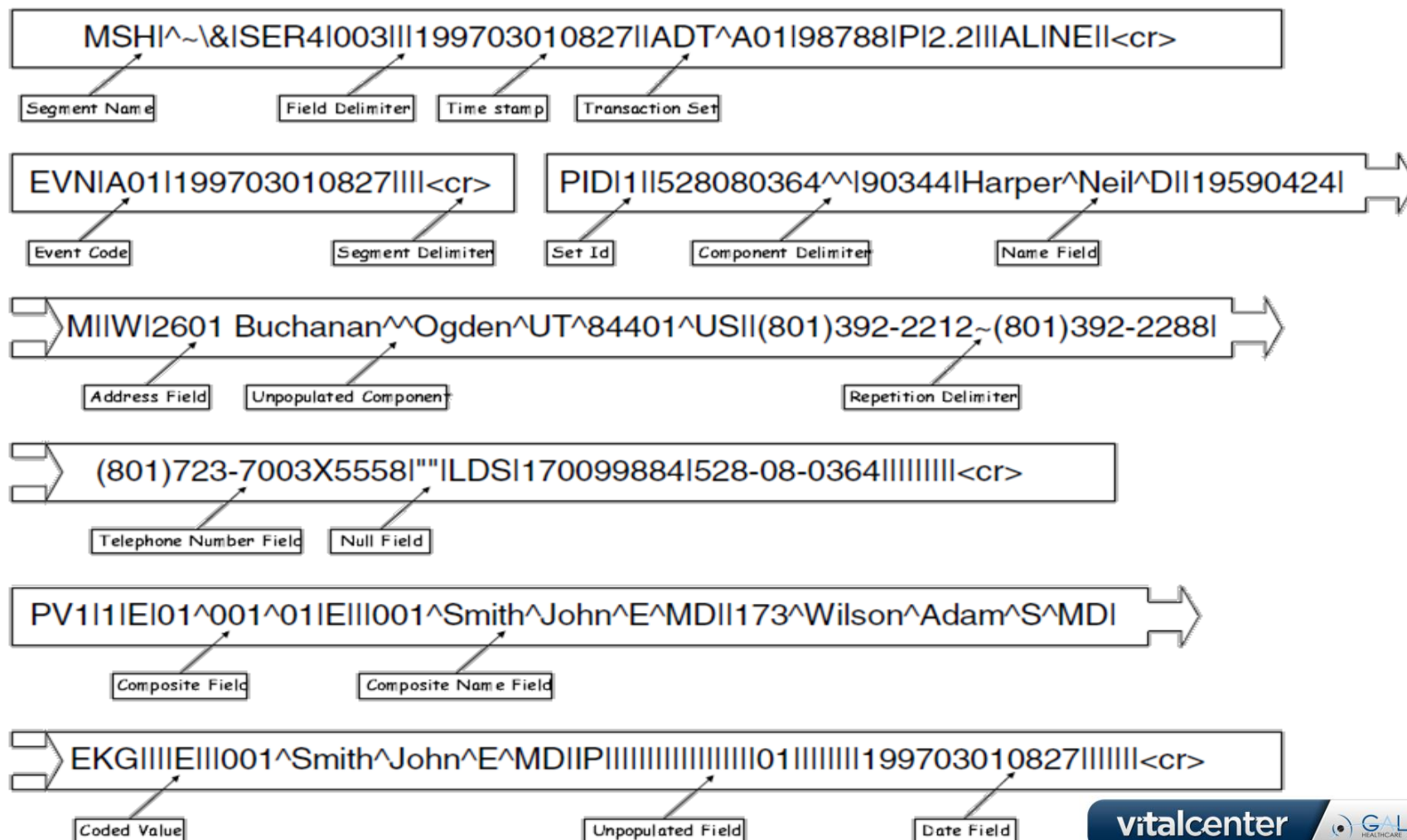
Delimiters

- | - Field Delimiter
- ^ - Sub Field Delimiter
- & - Sub-Sub Field Delimiter
- ~ - Separator for Repeating Fields
- \- Escape Character

Characteristics of HL7 Messages

MSH|^~\&|SEMM|PYXIS||20040301192350||ADT^A04|ADT757452230|P|2.1||| ←
EVN|A04|20040301192350| ←
PID|||H000000076||TESTCHRISTIANSEN^JOHN^||19931212|M|||1400 CHARLES
ST^^LOVES PARK^IL^61111||| ←
PV1||O|HH.ADULT^^|ELE||^|DEM^DEMING,RICHARD
E|^|^|||AROU||^|RCR||MED||||||||||||HHC||REG RCR|||200402251124|| ←
PD1|||DEM^DEMING,RICHARD E|| ←
GT1|||TESTCHRISTIANSEN,JOHN||1400 CHARLES ST^^LOVES ←
PARK^IL^61111|885-2277|||SP|745-69-5847|||
DG1|||TEST ←
IN1|1|MCR-A||MEDICARE|PO BOX
1602^^OMAHA^NE^68101||Y|||UNK|||||SP|||||1|||||||7896547 ←
ZSR|||||||||||||^|^|^||||||UNKNOWN ←

HL7 Sample Message



Mapping Example – Phone Number

 [34]-HomePhoneArea

 Pce(Script InboundPhone(PID.1-[13]-Phone Number - Home.1.1.0),-,1) | '0'

 [35]-HomePhoneExchange

 Pce(Script InboundPhone(PID.1-[13]-Phone Number - Home.1.1.0),-,2) | '0'

 [36]-HomePhoneLast4

 Ext((Pce(Script InboundPhone(PID.1-[13]-Phone Number - Home.1.1.0),-,3) | '0'),1,4)

ACK and NACK

- Every time an application accepts a message and processes the data it sends an Acknowledgement (ACK) back to the sending application.

```
MSH|^~\&|||SWA|201305221309||ACK|ADT1.1.9200|P|2.1|||  
MSA|AA|ADT1.1.9198
```

- A NACK is an ACK that contains an error that is sent back to the sending application.

```
MSH|^~\&|||201305221309||ACK|ADT1.1.9200|P|2.1|||  
MSA|AE|000001  
ERR|DRG_DiagnosisRelatedGroupSegment^1^11^unexpected data found
```

Interface Explorer

File Edit Tools Views Reports Options FTP TCP/IP Help

New Open Save Seg(s) Undo FTP Get FTP Put TCP/IP Filter Rec(s) Report View

```
MSH|^~\&|ALL|AHS|||201402130840||ADT^A31|63231_1420_RE|P|2.3||||ASCII|<13>
EVN|A31|201402130840||SIU|<13>
PID|1|1719254|1609746|TEST^SAMMY^^^^|19850316|F|WHT|1234 NEW ROAD^^ALBANY^NY^12208|(518)123-4567|ENG|MARRIED|||||NHISP|||||N|<13>
PD1|||||<13>
NK1|1|TEST^JOHN^^^^|||(518)123-4567|EP|||||||||||||||||<13>
PV1|||||||||||||||||||||<13>
```

Rec 1/1 Pg 1/1

MSH|^~\&|ALL|AHS|||201402130840||

PID-1	[Set ID]	1
PID-2	[Patient ID External]	
PID-3	[Patient ID Internal]	1719254
PID-4	[Alternate Patient ID]	1609746
PID-5	[Patient Name]	TEST^SAMMY^^^^
PID-5-1	[Family Name & Last Name Prefix]	TEST
PID-5-2	[Given Name]	SAMMY
PID-5-3	[Middle Initial Or Name]	
PID-5-4	[Suffix]	
PID-5-5	[Prefix]	
PID-5-6	[Degree]	
PID-6	[Mothers Maiden Name]	
PID-7	[Date Of Birth]	19850316
PID-8	[Sex]	F
PID-9	[Patient Alias]	
PID-10	[Race]	WHT
PID-11	[Patient Address]	1234 NEW ROAD^^ALBANY^NY^12208
PID-11-1	[Street Address]	1234 NEW ROAD
PID-11-2	[Other Designation]	
PID-11-3	[City]	ALBANY
PID-11-4	[State Or Province]	NY
PID-11-5	[Zip Or Postal Code]	12208
PID-12	[County Code]	
PID-13	[Home Phone]	(518)123-4567
PID-14	[Business-Phone]	
PID-15	[Language]	ENG
PID-16	[Marital Status]	MARRIED

HL7Spy - New

File Edit Tools Options View Window

New X

MSH|^~\&|SENM||PYXIS||20040301192350||ADT^A04|ADT757452230|P|2.1|||
 EVN|A04|20040301192350|
 PID|||H000000076||TESTCHRISTIANSEN^JOHN^||19931212|M|||1400 CHARLES ST^^LOVES PARK^IL^61111|||
 PV1||O|HH.ADLT^^^ELE||^|DEM^DEMING,RICHARD E|^|^|AROU|^|RCR|MED|HHC|REG RCR||200402251124|
 PD1|||DEM^DEMING,RICHARD E||
 GT1|||TESTCHRISTIANSEN,JOHN|1400 CHARLES ST^^LOVES PARK^IL^61111|885-2277|||SP|745-69-5847|||
 DG1|||TEST
 IN1|1|MCR-A||MEDICARE|PO BOX 1602^^OMAHA^NE^68101|Y|||UNK|1|7896547

HL7 SQL

History Execute Stop Results Messages Distinct Auto size Options Compare Export

1 row(s) Query

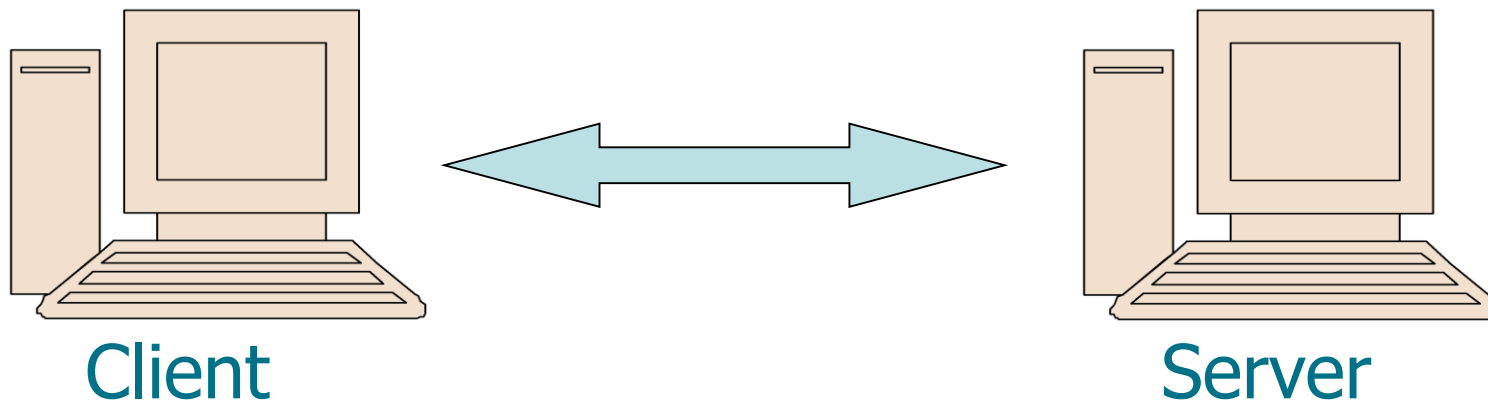
SELECT *, PID[1]-5.1.1 WHERE PID[1]-5.1.1 = 'TESTCHRISTIANSEN'

Query for matching text any where in the message

#	Date/Time	Type	Patient ID	Name	Accession #	PID-5.1.1
1	2004-03-01 19:23:50	ADT^A04	H000000076	TESTCHRISTIANSEN^JOHN		TESTCHRISTIANSEN

Data Exchange Standards

- Typically moved via a network connection via TCP/IP
- One acts as the Client and the other acts as the Server.
- The Client will open a TCP/IP Socket with the Server.
- This connection will be exclusively used for these two systems to communicate.



Data Exchange Standards

- Once the TCP/IP Connection is established the sending system can deliver an HL7 message

```
MSH|^~\&||SEM|||200605221309||ADT^A04|ADT1.1.9198|P|2.1
EVN|A04|200605221309
PID|1||M000001327||TEST^RECURRING^^^^||19680215|F|^^^^^|^^^^^|L0000295
12|74
DG1|1|TX||PROTIMES
PV1|1|O|RCA^^|||TESTC^TEST^CAROL|TESTC^TEST^CAROL|RCR||U|||
```

- The receiving system will acknowledge the message using an ACK Message

```
MSH|^~\&|||SWA|200605221309||ACK|ADT1.1.9200|P|2.1|||
MSA|AA|ADT1.1.9198
```

Data Exchange Standards

- The acknowledgment of the delivery of a message is a significant feature
- In the MSH of the sending message is a field called the Message Control ID (MCI).

MSH|^~\&||SEM|||200605221309||ADT^A04|**ADT1.1.9198**|P|2.1
EVN|A04|200605221309
PID|1||M000001327||TEST^RECURRING^^^^||19680215|F|^^^^^|^^^^^|L0000295
12|74
DG1|1|TX||PROTIMES
PV1|1|O|RCA^^|||HARR^HARNER^ROBERT|HARR^HARNER^ROBERT|RCR|U|||

MSH|^~\&|||SWA|200605221309||ACK|ADT1.1.9200|P|2.1|||
MSA|AA|**ADT1.1.9198**

Other Data Exchange Methods

- Other methods can be used to deliver HL7 messages to the receiving system.
 - Send message via FTP
 - Download and copy to a shared folder
 - Batch mode

Future

- Version 2.x has been approved by ANSI since the early 90's and is used throughout the Healthcare industry almost exclusively.
- Version 3.x is a departure from the 2.x version in how the messages are formatted.
- Version 3.x is based on XML, which is a Web based language.
- XML – CCD and Dictionary Updates

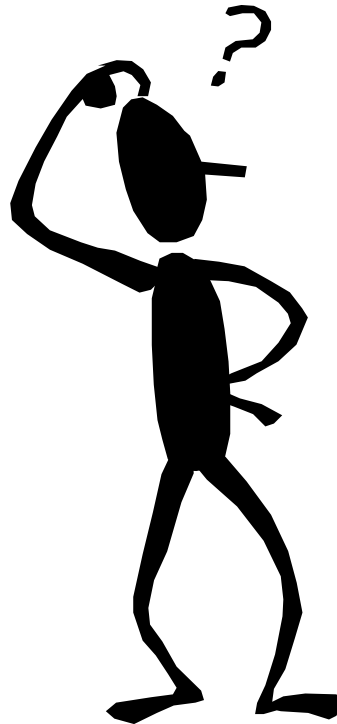
XML Message

```
<DictionaryEntry ID="93343:36">  
<Name>Other abdominal pain-R10.8</Name>  
<Code>R10.8</Code>  
<DxCode>R10.8</DxCode>  
<LastUpdate>ICD10 Upload</LastUpdate>  
<CreDt ID="63223">02/05/2014</CreDt>  
<CreTm>10:42AM</CreTm>  
<CreIni>KAT</CreIni>  
<UpdDt ID="63223">02/05/2014</UpdDt>  
<UpdTm>10:42AM</UpdTm>  
<UpdUsername>DGS</UpdUsername>  
<lcdCmDescription>Other abdominal pain</lcdCmDescription>  
<lcdCmCode>R10.8</lcdCmCode>  
<lcdCmVersion>10</lcdCmVersion>  
<VerNum>1</VerNum>  
<DeletedFlag></DeletedFlag>  
<IDXDictionaryInternalNumber>36</IDXDictionaryInternalNumber>  
<IDXDictEntryInternalNumber>93343</IDXDictEntryInternalNumber>  
</DictionaryEntry>
```

Steps to Successful Interface Development

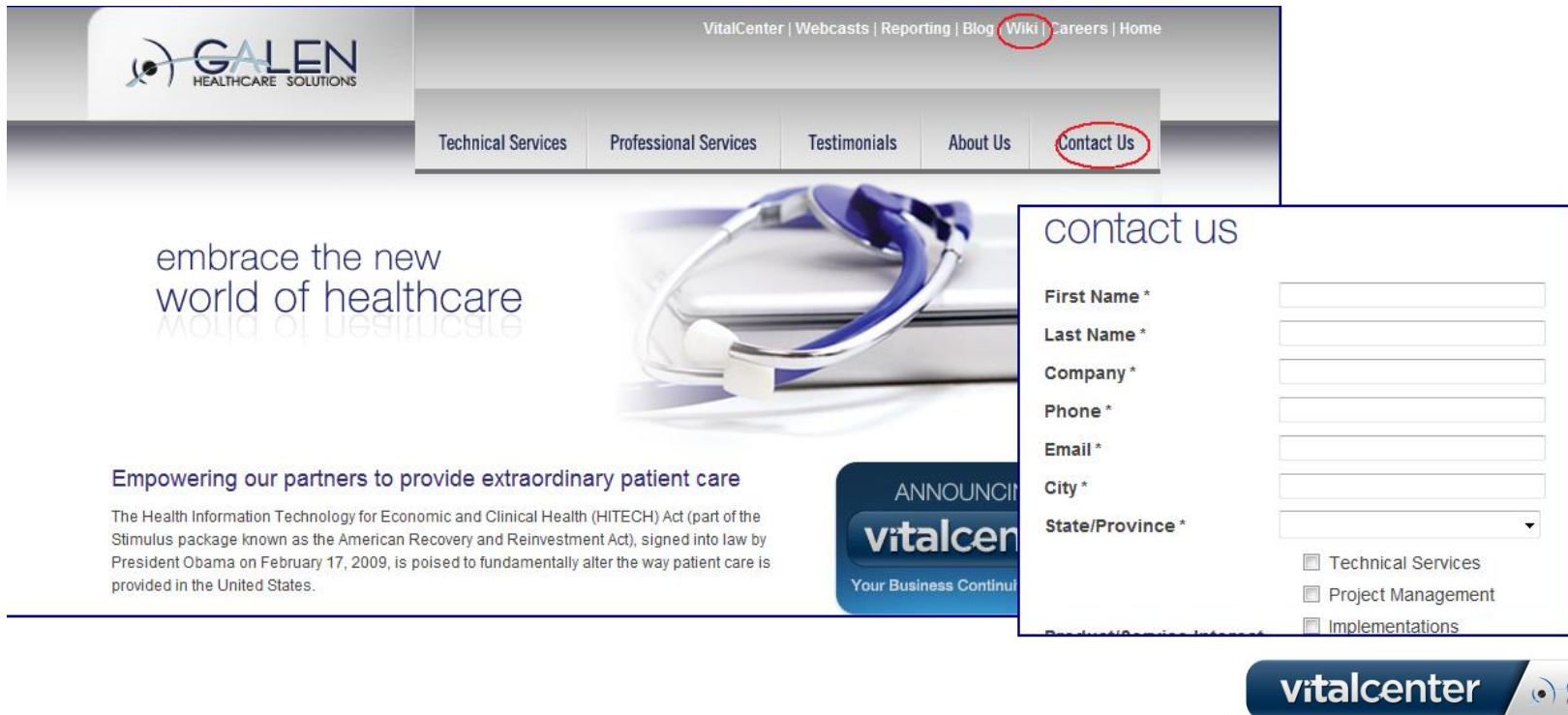
- Introductory Calls
- Calls to Vendors and Spec Exchange
- Kickoff Meeting
- Gap Analysis
- Plan Interface Design
- Build Interface in Test/Dev
- Deploy to Test
- Test Interface with Real Messages
- Was the Test Successful?
- Go-Live Prep
- Go-Live
- Was Live Testing Successful
- Post-Live Monitoring

Q&A



Thank you for joining us today, for additional assistance....

You can contact us through our website at
www.galenhealthcare.com



The screenshot displays the Galen Healthcare Solutions website. The header includes the company logo and navigation links: VitalCenter, Webcasts, Reporting, Blog, Wiki, Careers, and Home. A secondary navigation bar lists Technical Services, Professional Services, Testimonials, About Us, and Contact Us. The main content area features the slogan "embrace the new world of healthcare" with a stethoscope image. Below this, a text block discusses the HITECH Act. A "vitalcenter" logo is also present. A "contact us" form is overlaid on the right, containing fields for First Name, Last Name, Company, Phone, Email, City, and State/Province. It also includes checkboxes for Technical Services, Project Management, and Implementations, and a dropdown for Product/Service Interest.

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world of healthcare

Empowering our partners to provide extraordinary patient care

The Health Information Technology for Economic and Clinical Health (HITECH) Act (part of the Stimulus package known as the American Recovery and Reinvestment Act), signed into law by President Obama on February 17, 2009, is poised to fundamentally alter the way patient care is provided in the United States.

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