

- Introduction to HL7 -

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Session Overview

- Why standards in healthcare communications?
- What is HL7?
- HL7 in Australia
- A brief tour of HL7
- What is Version 3?
- What about XML?
- Q&A



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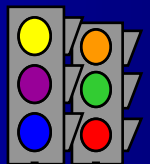
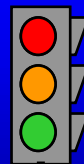
Why do we need Standards? (1)



Why do we need Standards? (1)



Why do we need Standards? (2)



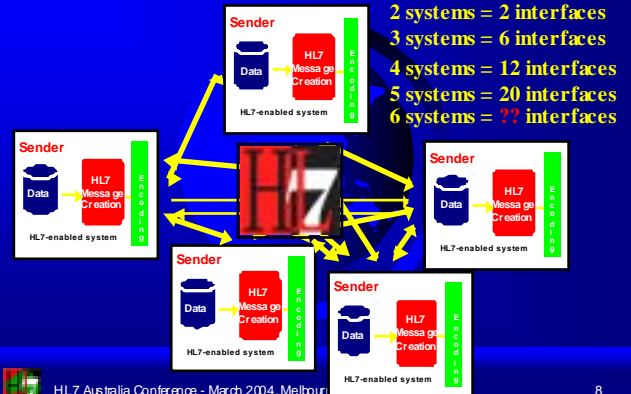
Why Standards?

- For Healthcare IT systems to exchange information, they can either:
 - communicate via custom interfaces *or*
 - share a common data format
- Custom interfaces are costly to design and difficult to maintain (~ \$100k each).

A common data format is cost-effective, but needs up-front agreement and commitment = "a Standard"



Why Communication Standards?



Other Examples of Standards

- Mobile Phones ("GSM")
- CDs ("ISO")
- ATMs
- "yes" and "no" in Bulgaria



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global HL7 Mission



- To provide standards for the exchange, management and integration of data that supports clinical patient care and the management, delivery and evaluation of healthcare services.
- Specifically, to create flexible, cost effective approaches, standards, guidelines, methodologies, and enable healthcare information system interoperability and sharing of electronic health records."



Interoperability

Interoperability

"Ability of two or more systems or components to exchange information and to use the information that has been exchanged"

[IEEE Standard Computer Dictionary: A Compilation of IEEE Standard Computer Glossaries, IEEE, 1990]

Functional interoperability

Semantic interoperability



A Brief History of HL7 ...

- 1987: Interested users in the US start work on a standard - "Health Level Seven"
- 1990: First standard (V2.1)
- 1993: HL7 V2.1 becomes the standard in the US
- 1994: HL7 V2.1 becomes the standard in the UK
- 1997: HL7 V2.1 becomes the standard in Australia
- August 2001: 1st V3 Draft is released.
- June 2003: HL7 V2.5 released.

More than 93% of all organisations in the US with Health IT systems use HL7!



What is HL7.org?

- ANSI-approved Standards Developing Organisation (SDO).
- Not-for-profit.
- >2200 members.
- >500 corporate members.
- Local organisations in 27 countries.
- Three 6-day Working Meetings per year.
- www.HL7.org



HL7 is a Global Standard!

- Argentina
- Australia
- Brazil
- Canada
- China
- Croatia
- Czech Republic
- Denmark
- Finland
- France
- Germany
- Greece
- India
- Ireland
- Italy
- Japan
- Korea (Sth.)
- Lithuania
- NZ
- Poland
- Southern Africa
- Spain
- Switzerland
- Taiwan
- Turkey
- The Netherlands
- United Kingdom
- USA

HL7 Organisations in 27 Countries!



Why Health Level "Seven"?

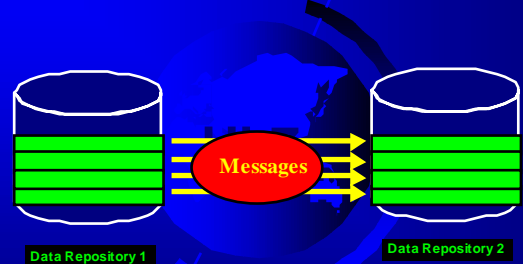


HL7: Messages and More ...

- Decision Support
 - Arden Syntax Standard (1999)
 - Guideline Interchange Format (GLIF)
- Visual Integration ("CCOW")
- Clinical Document Architecture (CDA)
- Oct. 2001: Electronic Health Record (EHR)



EHR + Messaging



("Rowal's Theoran")



Any Questions so far?



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Background Information

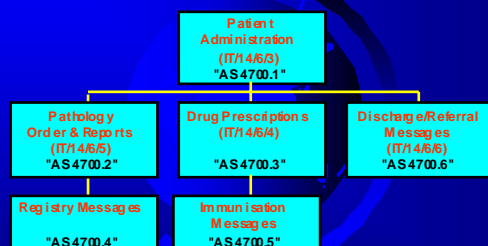
- In Australia, standards are created by "STANDARDS AUSTRALIA" - a government-supported organisation representing all stakeholders.
- The Australian Federal Govt acknowledged HL7 as the healthcare messaging standard in 1997.
- HL7 has achieved widespread acceptance in Australia & New Zealand.



Structure of HL7 Standards in Australia



SAA HL7 Technical Committees



Australian HL7 Standards

- AS4700.1: Patient Administration Standard
- AS4700.2: Pathology Orders and Results
 - Australian Pathology Implementation Guide HB262 ("Pathology Handbook")
- AS4700.3: Drug Prescriptions
- AS4700.4: Registry Messages
- AS4700.5: Immunisation Messages
- AS4700.6: Discharge/Referral Messages



Patient Administration

- Patient Administration Standard AS4700.1:
 - Based on HL7 Chapter 3 and parts of Ch. 2.
 - Recently updated to HL7 V2.4.
 - Includes Patient ID recommendations
 - Refers to AS5017



Pathology

- Pathology Orders and Results AS4700.2:
 - Based on parts of HL7 Chapters 4 & 7.
 - Is being updated to HL7 V2.3.1.
 - Includes Australian list of "Pathology Request Codes"
 - Will mandate LOINC and - possibly - SNOMED coding.
- Australian Pathology Implementation Guide HB262 ("Pathology Cookbook")



Registries Messages

- Registry Messages AS4700.4.
- Areas targeted:
 - Cancer registers.
 - Notifiable diseases.
- Ready for publication.



Drug Prescriptions

- Drug Prescriptions (AS4700.3):
 - A joint Australian/New Zealand Standard.
 - Govt. funded project to implement electronic prescriptions ("ANS") recently completed.
 - Updated and expanded to HL7 V2.3.1.



Discharge/Referral Messages

- Discharge/Referral Messages (AS4700.6):
 - One complete message - includes medication, investigation results, Problems, Goals & Pathways.
 - Content draft completed, to be embodied in messages.
- Completed, in Publication.

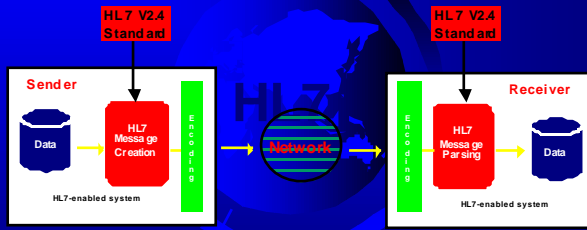


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How does HL7 Messaging work?



A HL7 Laboratory Result

```
MSH|^~&|PATH||GP123||20000826||ORU|101|P|2.4|34567||AL|NE|AU||en<cr>
PID||KNEE123||19331215||25 Shady Lane
LIGHTNING RIDGE NSW 2392|||219171800<cr>
OBR|1|PMS666|6|956635.9|LFT*LIVER FUNCTION TEST*N2270<cr>
OBX|1|NM|1751^*S Albumin^LN||38|g/L|35-45|||F<cr>
OBX|2|NM|1778^*S Alkaline Phosphatase^LN||50|U/L|30-120|||F<cr>
```



V2.x Abstract Message

MSH	Message Header
EVN	Event Type
PID	Patient Identification
[PD1]	Additional Demographics
[NK1]	Next of Kin /Associated Parties
PV1	Patient Visit
{PV2}	Patient Visit - Additional Info.
[GT1]	Guarantor
[IN1]	Insurance
[IN2]	Insurance Additional Info.
[IN3]	Insurance Add'l Info - Cert.

[] optional
{ } may repeat

Version 2.x Status

- November 8, 2002: V2.5 ballot opened
- December 15, 2002: V2.5 ballot closes
- January 12 - 17, 2003: San Antonio, USA
 - Reconcile V2.5 ballot
 - Start work on V2.6
- V2.5 is now complete – published in Sept '03
- Work on V2.6 has already started

HL7 Segment Definition

SEQ	LEN	DT	OPT	RP#	TBL#	ITEM#	ELEMENT NAME
1	1	ST	R			00001	Field Separator
2	4	ST	R			00002	Escape Characters
3	180	HD	R			00003	Application Facility
4	180	HD	R			00004	Application Facility
5	180	HD	R			00005	Facility Of Message
6	180	HD	R			00006	Facility Of Message
7	26	TS	R			00007	Time Of Message
8	4n	ST	R			00008	Control ID
9	7	CM	R			00009	Control ID
10	20	ST	R			00010	Control ID
11	3	PT	R			00011	Control ID
12	8	ID	R			00012	Control ID
13	15	NM	R			00013	Control ID
14	180	ST	R			00014	Control ID
15	2	ID	R			00015	Control ID
16	2	ID	R			00016	Control ID
17	2	ID	R			00017	Control ID
18	6	ID	R			00018	Control ID
19	50	CF	R	Y/3	0211	00602	Character Set
20	50	CF	R	Y/3	0211	00602	Principal Language Of Message

SEQ - position within segment
LEN - min/maxlength of field
DT - data type for field
OPT - optionality for field
RP/# - repeatability
TBL# - table number for codes
ITEM# - HL7 field number
ELEMENT NAME - name

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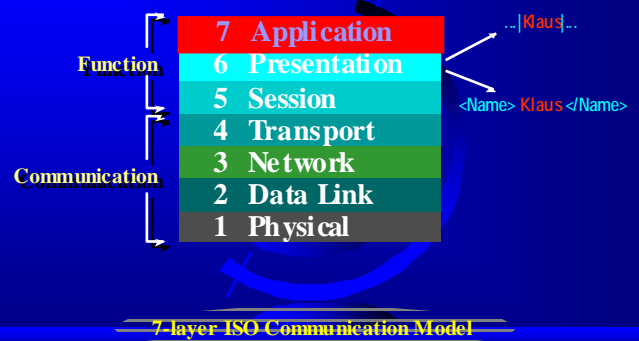
What about XML?

- eXtensible Markup Language
- A “sibling” of HTML, derived from SGML - ISO Standard 8879:1986(E).
- Structure: Name/Value pairs, eg.:

```
<Name> Klaus </Name>
```



How does XML fit in?



HL7 and XML

- HL7 V2.x can be encoded in XML!
 - V2.3, V2.3.1 and V2.4 have XML encoding specifications!
 - Easier to read, but voluminous (~7x)!
 - Cool!?
- HL7 V3 is committed to XML encoding.



XML Example

Example: Klaus D. Veil

V2.x encoding:

```
...|Veil^Klaus^D|...
```

XML encoding:

```
<PatientName>
  <Surname> Veil </Surname>
  <FirstName> Klaus </FirstName>
  <MiddleName> D </MiddleName>
</PatientName>
```



International HL7 Calendar

- Aug. 13 – 14, 2003: 3rd HL7 Conference, Sydney, Australia
- Aug. 21 - 22, 2003: 2nd Cross-Strait HL7 Mtg, Taipei, Taiwan
- Sept. 7 - 12, 2003: HL7 Plenary Meeting, Memphis, USA
- Oct. 16 - 17, 2003: 4th Int. Affiliates Meeting, Daegu, Sth. Korea
- Jan. 18 - 23, 2004: HL7 Working Meeting, San Diego, USA
- Feb. 22-26, 2004: HIMSS 2004, Orlando, USA
- **March 25-26, 2004: HL7 Australia Conference, Melbourne**
- May 2 - 7, 2004: HL7 Working Meeting, San Antonio, USA
- Sept. 26 - Oct. 1, 2004: HL7 Plenary Meeting, Atlanta, USA
- May 2005: HL7 Working Meeting, Europe

HL7 Events Calendar: www.HL7.org.au/Events



We need to use Standards!

