



OSEHRA

Enabling Open Source in Government

What does it take to implement VISTA outside of the US?

**By Sam Habel, Pharm.D.
Technical Fellow
OSEHRA**

Outline



- 1. Character Sets & Bidi**
- 2. Date and Number Formatting**
- 3. Terminologies and Lexicon**
- 4. Printing Patient Information**
- 5. Medicine Practice/US Law**
- 6. Demographics**

Character Sets

- **VistA as-is runs as ASCII**
 - (with very limited ISO-8859-1 encoding for Spanish)
- **A couple of international implementations use single byte encodings**
- **Multibyte encoded languages need to use UTF-8.**

VistA and UTF-8

- **There are some minor issues with Fileman**
 - }}} or ~ to end loops
 - z to jump to the end of lookups
 - Printing columnar output with multi-byte encodings.
- **Major issues with Delphi Clients (including CPRS)**
 - My latest test on 30c showed that it's still single byte encoding.
- **XWB Broker is not UTF-8 safe.**

VistA and UTF-8 (cont)

- **Some VistA code uppercases by subtracting 32 from a code point value**
- **Terminal shortcuts assume Roman Letters keyboard**
- **GT.M/YottaDB has better UTF-8 support than Cache**
- **EHS's UTF-8 Experiment (2009):**
 - <http://smh101.blogspot.com/2011/04/unicode-support-for-vista-jordan.html>

VistA and UTF-8 (not!)

- **Single-Byte encodings**
 - Windows-1256 (Arabic), TIS-620 (Thai)
 - Solve the Delphi Issue, solve XWB broker issues
- **But**
 - M implementation can get confused if it doesn't understand the locale correctly in pattern machings (e.g. Patient Names)
 - Printers don't support these encodings

VistA and Bidi

- **Bi-directional text**
- **Issue for Arabic, Hebrew, Urdu, and Persian.**
- **Mostly works as it is handled by the infrastructure, except:**
 - Fileman columnar reports
 - SSN formats in CPRS

Date Formatting

- http://en.wikipedia.org/wiki/Calendar_date
 - Little Endian 30/11/2011- Most common
 - Middle Endian 11/30/2011- US Format
 - Big Endian 2011-11-30 – Some countries
- **VistA: Middle Endian in some places, alpha-date in most.**
- **M APIs can be made internationalized, but a lot of VistA doesn't use Date APIs**
 - TIU
 - Scheduling

Date Formatting, cont.

- **CPRS, BCMA will present challenges with dates**
 - If you change your Windows Locale, the following will stop working in CPRS:
 - Cumulative Labs
 - Vitals Graphing in Reports
- **CPRS expects dates from Vista to be valid numbers. 3101130.123031 would not parse in German and Nordic Locales.**

Number Formatting



- **If you use a comma to delimit decimals, you will have many problems in VistA code.**

Terminologies and Lexicon

- International installations are very unwilling to invest in terminologies while they experiment
- Terms that ship with VISTA are US based (e.g. ICD-10-CM-US)
- ICD-10 is free to use
- SNOMED-CT needs a license from IHSTDO.
- CPT is proprietary, but is baked into VistA.

Terminologies and Lexicon

- **No auto correct for mis-spellings**
 - And non-English speakers are already bad at spelling.
- **Medical Conditions may have different local abbreviations**

Printing Patient Info

- **Zebras support UTF-8.**
- **HP Printers—not by default.**
- **Pharmacy Labels**
 - Spanish Framework was used in Jordan
 - Worked for Arabic
 - Did not work for Thai
 - Used sed script to translate a PCL document to a Zebra document

Differences in practice of Medicine

- **Different Drugs**
 - Don't underestimate Japanese Drugs!
- **Labs**
 - Labs are the same
 - But panels are different
- **Growth Charts**
 - Most of world uses WHO Standard, not NHANES
 - Percentiles vs Z Scores

Differences in practice of Medicine

- **Vitals**
 - Metric vs English
- **Abbreviations**
 - OD vs QD

Vitals Lite: Vitals for ZZ PATIENT, TEST TWO Dec 25, 1957 (53)

File Help

ZZ PATIENT, TEST TWO Hospital Location: DR OFFICE
Dec 25, 1957 (53) From - To: 03/12/90 - 11/17/90

Entered in Error Enter Vitals Allergies

Six Months
One Year
Two Years
All Results
DATE RANGE
05/17/11 - 11/17/11

Values
 Time Scale
 3D
 Allow Zoom

10

Respiration

07-19-05 15:58:00

Temp:	99
Pulse:	32*
Resp:	23
P O ₂ %:	
L/Min/%:	
B/P:	220/89*
Wt (lbs):	200
BMI:	27.18*
Ht (in):	72
C/G:	
CVP (cmH2O):	
In 24hr (ml):	
Out 24hr (ml):	
Pain:	5
Location:	DR OFFICE
Entered By:	DOCTOR,ONE

US Law baked into VistA



- **SSNs**
- **DEA Rules**

Demographics

- Your country may not have postal codes
- Different Rules than VA Rules
 - Jordan: A wife must have her husband's contact info
 - Not vv
- Names look very different and are searched differently
- 35 characters are not enough

Conclusion



- **In spite of all of this, the most important factor is clinical leadership and good implementation.**
- **If you want VistA for your entire country, be prepared to spend some time seeing what works for you.**