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

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Outline

- Support for different Character Sets
- Bidi
- Date Formatting
- Number Formatting
- Variant spellings
- Differences in the practice of medicine
- Different Demographics
- US Law Baked into VISTA
- Terminologies and Lexicon
- Printing Patient Info (e.g. Rx Labels)

Introductions

- Most people who may consider using VISTA use English as their language of choice for medical documentation

- Harder to use VISTA if that's not the case

  - e.g. Lexicon is off limits if not using English

- MSC Fileman/22.2 is i18n/l10n capable

- OpenVista CIS is also i18n/l10n capable

  - Uses Mono.Internationalization

Support for Different Character Sets

- A very big topic
    - Single Byte vs Multi Byte

Multi-Byte Encodings

- Use UTF-8, the winner in the encoding wars

- Why use multi-byte encoding?

- GT.M vs Cache

- Biggest Problem

  - Delphi's lack of support for multi-byte Character Sets

  - (Introduced in 2009!)

- Existing Spanish in VISTA is in ISO-8856-1

VISTA issues with mb encodings

- Bad uppercasing
  - AUPNLK1I.m:21: I AUPX?.E1L.E F AUPI=1:1:$L(AUPX) S:$E(AUPX,AUPI)?1L AUPX=$E(AUPX,0,AUPI-1)_$C($A(AUPX,AUPI)-32)_$E(AUPX,AUPI+1,$L(AUPX))
  - XLFNAME1.m:180: F %=2:1:$L(X) I $E(X,%)?1U,$E(X,%-1)?1A S L=$E(X,%),L=$C($A(L)+32),$E(X,%)=L
  - XLFNAME8.m:160: I XUC?1L S XUC=$C($A(XUC)-32) Q 1
  - ORWPT2.m:39: X "F %=1:1:$L(X) S:$E(X,%)?1L X=$E(X,0,%-1)_$C($A(X,%)-32)_$E(X,%+1,999)"
  - ORWPT2.m:127: X "F %=1:1:$L(X) S:$E(X,%)?1L X=$E(X,0,%-1)_$C($A(X,%)-32)_$E(X,%+1,999)"
  - ORWPT3.m:49: .X "F %=1:1:$L(X) S:$E(X,%)?1L X=$E(X,0,%-1)_$C($A(X,%)-32)_$E(X,%+1,999)"

VISTA issues, cont.

- DICFIX1 infinite loop
  - Predicated on the fact that ~ is the last character in ASCII. Not true for UTF-8.
  - Fixed in MSC Fileman 1040-41
    - Cache has a crazy UTF-8 implementation
- Fileman STILL has code that jumps to }}}} in comma matching.
- Function key-ASCII sequences require a Roman Alphabet

VISTA issues, cont.

- Broker Issues
  - XWB broker had no issues
    - At least the Medsphere Implementation in C# in OpenVista.Remoting
  - BMX broker was hard-coded to use ASCII and only counted characters not bytes. I fixed these.

VISTA issues, cont.

- Delphi: Random Crashes

- EHS's UTF-8 experiment

  - http://smh101.blogspot.com/2011/04/unicode-support-fo

Single-Byte Encodings

- Welcome Windows-1256, TIS-620

- Delphi issues solved

  - But XML?

- M Issues

  - XLFNAME routines mistakes valid characters for punctuation

- Communication Issues

  - Printers

Bidi

- An issue unique to Arabic and Hebrew (and derivatives)
  - Urdu, Persian
  - Aramaic anyone?
- Complex rules
- Mostly handled by infrastructure, except when it doesn't work.
  - Fileman columnar reports in Putty
  - Fileman columnar reports printed
  - Formatting fake SSN's 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
- A very important issue in medicine!

VISTA Dates, M Side

- 2 main Date API Families in VISTA

    - Fileman (%DT, %DTC)

    - Kernel (XLFDT)

- MSC Fileman supports date l10n

    - E.g. add this entry to language file

ID NUMBER: 10   NAME: ARABIC

 DATE INPUT: S:$G(%DT)'["I" %DT=$G(%DT)_"I" G CONT^%DT

 DATE/TIME FORMAT (FMTE): N %T,%R,%F S
%T="."_($E($P(Y,".",2)_"000000",1,7)) S %F="3" D F3^DILIBF S Y=%R

VISTA Dates, M side

- Kernel… no l10n for Dates
  - But easy to do: Change XLFDT
  - Before:

T2 S %T="."_$E($P(Y,".",2)_"000000",1,7)

 D FMT^XLFDT1 Q %R

After:

T2 **Q:($G(DUZ("LANG"))>1) $$OUT^DIALOGU(Y,"FMTE", %F) ; smh – support for intl dates**

 S %T="."_$E($P(Y,".",2)_"000000",1,7)

 D FMT^XLFDT1 Q %R

VISTA Dates, M side

- Unfortunately, a lot of VISTA doesn't use Date APIs

- They make their own

  - TIU

  - Scheduling (R&S)

- Or parse it by hand, always display MM-DD-YYYY.

VISTA Dates, Delphi Side

- Unfortunately, not changeable.

- Several issues running CPRS in British mode

    - Cumulative Lab report doesn't work

    - Vitals graphing (in reports) doesn't work

    - One more... I don't remember

- Bonus

    - Fileman dates are not valid numbers in a number of European Countries: 3101130.123031 would not parse in German and Nordic Locales.

VISTA Dates, Scheduling GUI

- C'est moi

- I had to make VISTA and the Scheduling GUI communicate using the neutral Timson Date Format

- Rest of GUI is .Net.
  - Microsoft has their ducks mostly lined up.

- Not quite a date issue
  - Start of Week – important for Scheduling

VISTA Dates, Esoterica

- Hijri Calendar
- Buddist Calendar

Number Formatting

- I didn't investigate this issue in my time

- MSC Fileman supports Number l10n

- Language File

  - ID NUMBER: 2   NAME: GERMAN

  - CARDINAL NUMBER FORMAT: S:$G(Y) Y=$TR($FN(Y,","),",",".")

Differences in the 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
- Vitals
  - Metric vs English

Differences in the practice of medicine

- Abbreviations
  - OD vs QD
- Metric vs English
  - Vitals package is rather a bit too American

File   Help

ZZ PATIENT, TEST TWO

Dec 25, 1957 (53)

Hospital Location: DR
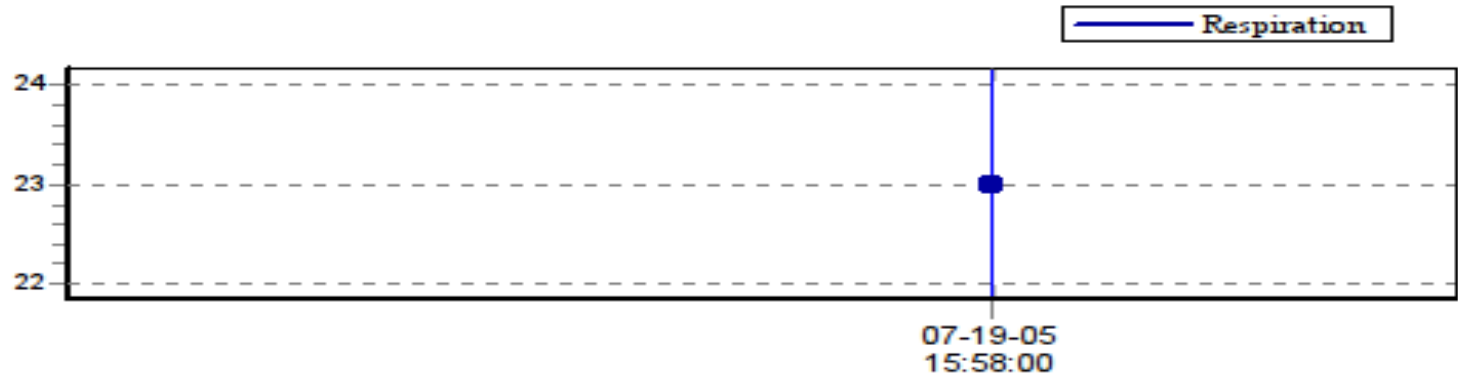
From - To: 03/12/90 — 11/

Entered in Error   **Enter Vitals**   **Allergies**

Six Months
One Year
Two Years
All Results
DATE RANGE
05/17/11 -- 11/17/1

☐ Values
☑ Time Scale
☐ 3D
☐ Allow Zoom

10

———— Respiration

24

23

22

07-19-05
15:58:00

Respiration ▼

	07-19-05 15:58:00
Temp:	99
Pulse:	32*
Resp:	23
P Ox %:	
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

Vitals

Vitals			
T	99 F	Jul 19,20	
P	32	Jul 19,20	
R	23	Jul 19,20	
BP	220/89	Jul 19,20	
HT	72 in	Jul 19,20	
WT	200 lb	Jul 19,20	
PN	5	Jul 19,20	

Notes	Consults	D/C Summ	Labs

Demographics

- No zip codes
- No states
- Rudimentary postal system
- 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!

US Law baked into VISTA

- SSNs

- DEA Rules

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-9 CM)

- Free Terminologies are easy to use

  - ICD-9; ICD-0

  - Can use ICD-0 in PTF

- CPTs

  - Draconian Licensing Rules

  - Baked into VISTA—difficult to document sans CPT

Terminologies and Lexicon

- SNOMED
  - Needs some paperwork
  - SNOMED use is very limited in VISTA though
- No auto correct for mis-spellings
- Doesn't work well with British spellings
  - Raw Lexicon works, but not CPRS
- Medical Conditions that have different "local" abbreviations

Variant Spellings

- Oedema?

- Colour Blindness? (Color Blindness works)
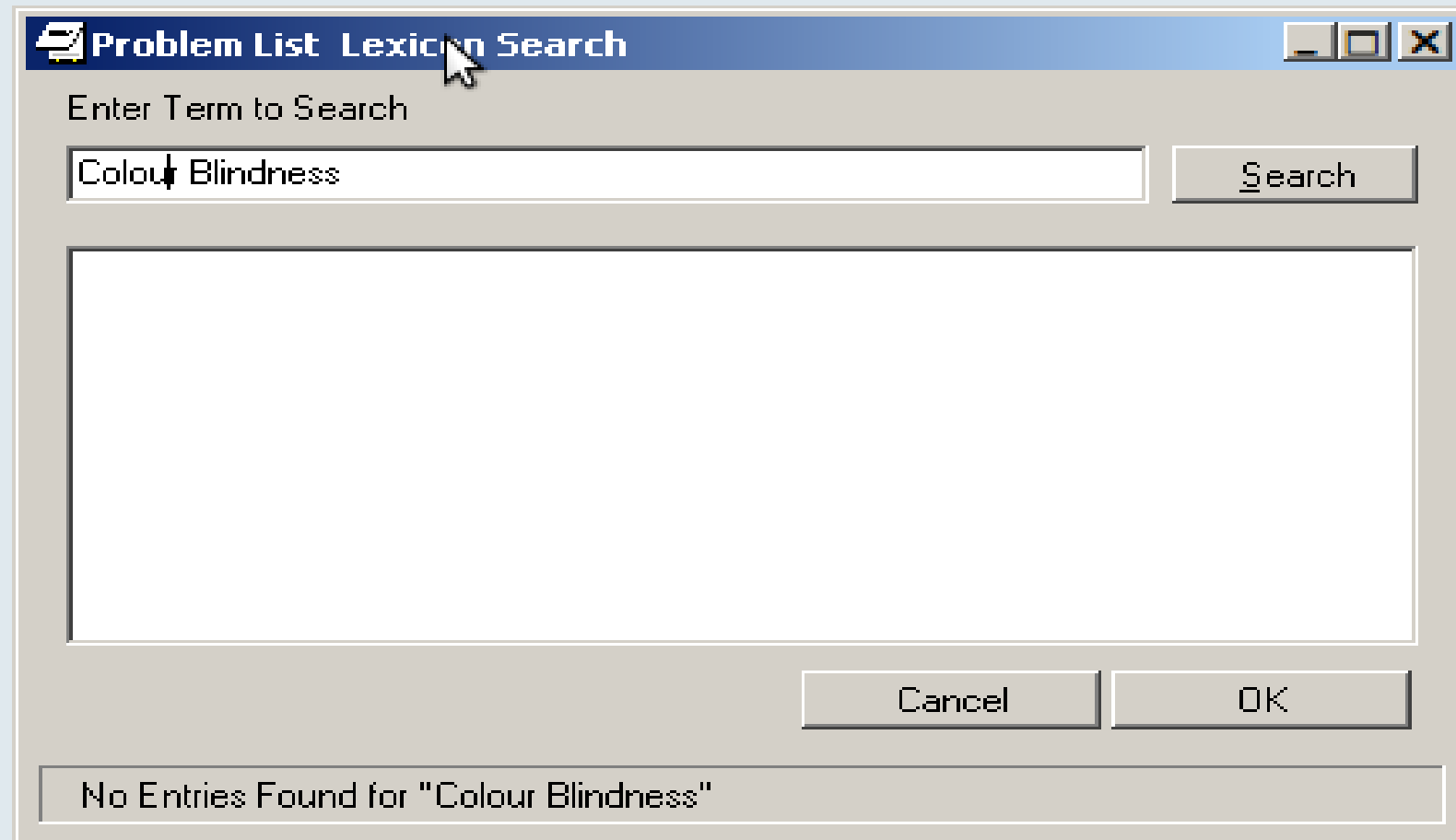
Any spellings!

- Not quite a VISTA issue, but non English speakers have a hell of a time spelling English!

Printing Patient Info

- Handled in Pharmacy using Spanish Framework

  - But sentence order is not quite correct though!

  - Works for Arabic

  - Not for Thai

- Otherwise, not handled at all.

Conclusion

- Bringing in a new computer system is the equivalent of a somebody in a horror movie saying 'I am just going to pop into the basement' – Susan Calman

- Most important factor in i18n installations is clinical leadership and good implementation

- 'If this project fails, it won't be because of the software' – Me