INTERNATIONALI[SZ]ATION FOR LOCALIZATION (i18n for l10n)

Eike Rathke

Software Engineer

Sun Microsystems

Internationalization Myths

“My product uses open source and so internationalization requirements don't apply.”

Myth #5, The I18n G.A.L.

http://blogs.sun.com/roller/page/i18ngal?entry=myth_5_for_open_source

Agenda

- Terms
- History
  - class International, Numberformatter, i18n framework
- Standards
  - ISO 639, ISO 15924, ISO 3166, RFC 3066
- Today
  - Services, ICU, shortcomings
- ToDo
  - Next, near future, medium future, far future

Glossary - Terms

- locale [lO-'kal]
  - Combination of language plus region/country/culture
- globalization (g11n)
  - The overall process
- internationalization (i18n)
  - Abstract out local details
    - Prepare software such that it runs independent of locale assumptions with different locales
- localization (l10n)
  - Specify details for a particular locale

Ideal Internationalized Program

- Same executable can run worldwide
- No hardcoded UI messages or labels
- Culturally-dependent data localized
- Support for new languages does not require recompilation
  - > OOo: no recompilation, but build resources in tree
- Can be localized quickly
  - > OOo: does take its time

Culturally Dependent Data

- Messages
- Labels on GUI components
- Online help
- Sounds
- Colors
- Graphics
- Icons

- Dates
- Times
- Numbers
- Currencies
- Measurements
- Phone numbers
- Honorifics and personal titles
- Postal addresses
- Page layouts

History - class International

- tools/inc/intn.hxx
  tools/source/intntl/intn{,2,lang,tab}.cxx
  - Table data hard-coded into the source code
    - LanguageTable: day and month names of Gregorian calendar, quotation marks, pointers to character handling specific functions like upper/lower case, compare; language centric
    - FormatTable: separators and all information needed for number formatting; country centric
      - Only on Windows®: merged-in system data from Regional Settings
    - pros: flexible because every single data item was exchangeable during runtime
    - cons: hard to maintain, full functionality on Windows® only, LCID centric

Microsoft® Locale Identifier (LCID)

- 16-bit value
  - Lower 10 bits primary language ID
  - Upper 6 bits sub-language ID
  - e.g. primary 0x09 combined with secondary 0x01
    == (0x01 << 10) | 0x09 == 0x0400 | 0x09 == 0x0409
  - User-definable value ranges
    - primary: 0x0200 to 0x03FF
    - secondary: 0x20 to 0x3F
    - all other values reserved for Windows® system use
    - e.g. (0x01 << 10) | 0x022B == 0x062B
  - More details in comment of tools/inc/lang.hxx

Numberformatter Legacy

- Predefined format codes
  - > Fixed meaning of format indices
    - > NUMBER_INT (index 1), NUMBER_DEC2 (index 2)
  - > Windows® Regional Settings followed in some formats
    - > NUMBER_SYSTEM (index 5)
DATE_SYSTEM_SHORT (index 18)
  - > Settings obtained for separators and YMD order
    - > DATE_SYS_DDMMYY (index 20)
DATE_SYS_DDMMYYYY (index 21)
      - – DATE_SYS_DDMMYY could be DD.MM.YY, MM/DD/YY, YY-MM-DD
DATE_SYS_DDMMYYYY similar but with 4 digits year

constant's names in offapi/com/sun/star/i18n/NumberFormatIndex.idl

History - Transition

- Transition to i18n framework
  - Focused on easy adoption by the applications
    - Similar data layout
    - Almost identical method names and functionality provided by intermediate layer,
      unotools/inc/*wrapper.hxx
      unotools/source/i18n/*.cxx
  - Parallel worlds of OpenOffice.org / StarOffice
    - Module i18n: basic implementation for OOo, more sophisticated implementation for SO based on proprietary code and data
    - Successive implementation of CJK functionality in module i18npool, emptying proprietary module i18n

Glossary - Standards

- ISO 639 language codes
  - ISO 639-1 Alpha-2 code
  - ISO 639-2 Alpha-3 code
    - ISO 639-2/B for bibliographic use
    - ISO 639-2/T for terminological use, used in OOo
  - ISO 639-3 Alpha-3 code for comprehensive coverage of languages (end of 2006)
  - ISO 639-4 Implementation guidelines and general principles for language coding (planned, 2007?)
  - ISO 639-5 Alpha-3 code for language families and groups (planned, 2008?)

Glossary - Standards

- ISO 15924 script codes, Alpha-4 and Numeric-3
  - e.g. Latn / 215, Cyrl / 220; not yet supported by OOo
- ISO 3166 country codes
  - ISO 3166-1Alpha-2, public part, used by OOo
    - e.g. SI, DE, ZA
  - ISO 3166-1Alpha-2, Alpha-3, Numeric-3, commercial
    - e.g. ZA, ZAF, 710, South Africa, Republic of South Africa
  - ISO 3166-2subdivision (region) codes
    - e.g. SI-01, DE-HH, ZA-WC

Glossary - Standards

- ISO 4217 currency codes, Alpha-3 and Numeric-3
  - e.g. EUR / 978, USD / 840; OOo uses Alpha-3
- ISO 8601 date and time representation
  - e.g. 2005-09-29T10:45
- Unicode character coding system
  - Unique number for every character
    - no matter what the platform
    - no matter what the program
    - no matter what the language
      - http://www.unicode.org/standard/WhatIsUnicode.html

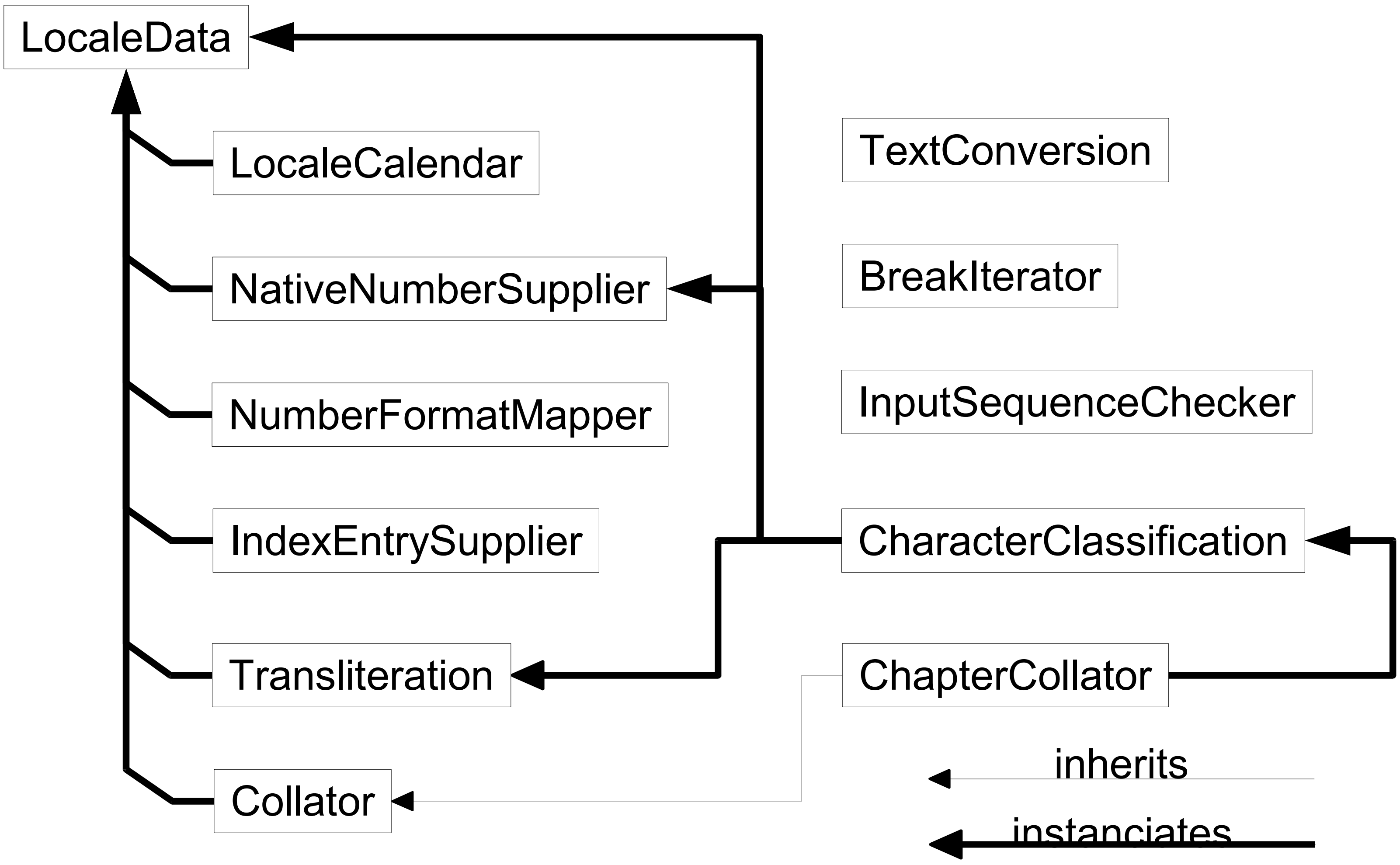
Glossary - Standards - RFC 3066

- RFC 3066 tags for the identification of languages
  - primary-subtag
    - ISO 639-1
    - ISO 639-2
    - "i-something" IANA registered language; not supported by OOo
    - "x-something" private use; not supported by OOo
  - second subtag
    - ISO 3166 alpha-2
    - 3 to 8 letters IANA registered
      - e.g. primary-second: sl-nedis, sl-rozaj, sr-Cyrl, sr-Latn; not in OOo
  - subsequent subtags.

Glossary - Standards - RFC 3066bis

- RFC 3066bis   planned successor of RFC 3066
  - More detailed view later

Today - Services Overview



What OOo Uses From ICU

- Unicode data, character types, script types
- Breakiterator
- Rule based collator
- Glyph layout engine
- Calendar
- Not used:
  - locale data, encoding conversions, string functionality, number formatting

Shortcomings of Framework

- Design legacy
  - started as a replacement of class International
  - to support the existing code of the applications
- Published API not easily extensible, old API has to be kept stable and maintained
  - new methods only via optional interfaces
  - struct LocaleDataItem can't change size
  - enum UnicodeScript without "supersizer" can't be extended

ToDo - Next

- Alignment with CLDR (Common Locale Data Repository)
  - > LocaleDataAudit_OOo_CLDR.html
  - > Align OOo to CLDR
    - > with help of tools that merge-in CLDR data
    - > first set of ~15 locales in OOo2.0
    - > most remaining locales for OOo2.0.1
  - > Align CLDR to OOo
    - > needs filing bugs against CLDR and providing "evidence"

ToDo - Near Future

- Upgrade to ICU 3.4 / 3.6
  - Will eliminate almost all patches currently applied to 2.6
    - goal of using system's ICU is nearer
  - Better support of glyph layout for Indic languages
  - Upstream ICU 3.6 will incorporate OOo patches for Khmer and Tibetan / Dzongkha
  - Some minor annoyances removed
    - sr_YU kludge instead of sr_CS not necessary anymore
    - sh_YU kludge could become sr_Latn_CS if OOo supported sr_Latn as language with script identifier

ToDo - Medium Future

- RFC 3066bis and draft ietf-ltru
  - Successor of RFC3066
  - Internet Engineering Task Force
    Language Tag Registry Update
  - http://www.inter-locale.com/ID/why-rfc3066bis.h
  - http://www.ietf.org/html.charters/ltru-charter.htm
  - language_country => language_[script]_region initially conforming to ISO 639, ISO 15924, ISO 3166
  - Stability and accessibility of the underlying ISO standards not guaranteed => registration with IANA
    - e.g. ISO 3166 code CS was reused by ISO

ToDo - Future

- Separate string resources from build process
- Genitive month names in date formats
  - CLDR already has the data, OOo needs to adopt it
  - LocaleCalendar XCalendar::getDisplayName() must support it
  - Numberformatter must support it
  - Other code places maybe as well
- Support for plural forms

URLs

- There's only one you really need to bookmark:
  - http://www.erack.de/bookmarks/D.html#i18n has it all and will be continuously updated.

INTERNATIONALI[SZ]ATION FOR LOCALIZATION (i18n for l10n)

Eike Rathke

erack@sun.com