Internationalization Programming for Mobile Applications

Roy Tetsuro Yokoyama
Principal Globalization Engineer
Motorola – GTG

31st International Unicode Conference
October 17th 2007
Internationalization Programming for Mobile Applications

Agenda

• Introduction for Mobile devices
• Globalization for Mobile devices
• Localization for Mobile devices
• Tips & Tricks for Mobile application development
• Future trends in Mobile
• Q&A
Internationalization Programming for Mobile Applications

Agenda

• Introduction for mobile devices
  – mobile phones
  – mobile data standards
  – mobile operating systems
  – mobile hardware
• Globalization for Mobile devices
• Localization for Mobile devices
• Tips & Tricks for Mobile application development
• Future trends in Mobile
• Q&A
Internationalization Programming for Mobile Applications

Mobile phones
- Consumer mobile devices
- Pro-sumer mobile devices
- Enterprise smartphone devices
Internationalization Programming for Mobile Applications

Mobile data standards

- GSM family
  - GSM
  - GPRS
  - EDGE
  - W-CDMA
- CDMA family
  - CDMA 2000
  - EV-DO
- Others
  - WIMAX
  - PHS
Internationalization Programming for Mobile Applications

Mobile Operating Systems

- Palm
- Microsoft Windows Mobile
- Symbian
- Java
- Linux
- Custom OS
Internationalization Programming for Mobile Applications

Mobile hardware

- Screen layout
- Screen resolution
- Barcode reader
- GPS
- Camera
- WiFi
- Bluetooth
- Infrared
- Voice Recording
- Multi-Media playback
- Memory card expansion

- Numeric Only keypad
- Command buttons
- Jog Wheel
- Software keyboard
- Handwriting recognition
- Touch screen
- Five-way Joystick
- Navigation buttons
- Home buttons
- Hotkeys
- QWERTY keyboard
Internationalization Programming for Mobile Applications

Agenda

- Introduction for Mobile devices
- **Globalization for Mobile devices**
  - Operating system
  - File system
  - Device encoding and locale
  - Formatting string
  - Character encoding conversions
  - Locale support
  - Surrogate pairs
- Localization for Mobile devices
- Tips & Tricks for Mobile application development
- Future trends in Mobile
- Q&A
# Internationalization Programming for Mobile Applications

## Globalization – Operating system

<table>
<thead>
<tr>
<th>Palm 5</th>
<th>Windows Mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code Page OS</td>
<td>Unicode OS</td>
</tr>
<tr>
<td>Closed source</td>
<td>Windows CE base (Standard/Classic/Prof)</td>
</tr>
<tr>
<td>Compact</td>
<td>32-bit</td>
</tr>
<tr>
<td>Single-tasking (multitask support)</td>
<td>Multi-Threading</td>
</tr>
<tr>
<td>Event driven</td>
<td>Event driven</td>
</tr>
<tr>
<td></td>
<td>Most of Win32 API plus unique APIs</td>
</tr>
</tbody>
</table>
Internationalization Programming for Mobile Applications

Globalization – File system

**Palm 5**

No special system folders.
- All applications are installed under internal memory or external memory.

**Application Categories**
- Applications can be categorized and grouped.

**Windows Mobile**

Windows system folder names are localized:
- Windows
- My Document
- My Pictures
- Start menu
- Program Files
- My Device

Use Windows Shell API:
- SHGetSpecialFolderPath()
Internationalization Programming for Mobile Applications

Globalization – Device encoding and locale

**Palm 5**

Use Preferences API:
- PrefGetPreference()
  - LmLocaleType.language
  - LmLocaleType.country

**Windows Mobile**

Windows National Language Support API:
- GetSystemDefaultLCID()
- GetUserDefaultLCID()

MUI language: use Registry value:
- HKEY_LOCAL_MACHINE
- nls
- DefaultLCID
Internationalization Programming for Mobile Applications

Globalization – Formatting string

**Palm 5**

Use Text Manager APIs:

- `TxtParamString("\^0 \^1", p1, p2...);`
- `TxtReplaceStr("\^0 \^1", p1, p2...);`

**Windows Mobile**

Use Win32 SDK string format API:

- `FormatMessage("%1 %2")`
# Internationalization Programming for Mobile Applications

## Globalization – Character encoding conversions

<table>
<thead>
<tr>
<th>Palm 5</th>
<th>Windows Mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text and International Manager</td>
<td>Use Windows API</td>
</tr>
<tr>
<td>•TxtConvertEncoding();</td>
<td>• MultiByteToWideChar();</td>
</tr>
<tr>
<td></td>
<td>• WideCharToMultiByte();</td>
</tr>
</tbody>
</table>
Internationalization Programming for Mobile Applications

Globalization – Locale support

### Palm 5

- Use Preferences API:
  - `PrefGetPreference()`

- Use Time Manager:
  - `DateTemplateToAscii()`
  - `TimeToAscii()`

- Use String Manager:
  - `StrCompare()`
  - `StrLocalizeNumber()`

### Windows Mobile

- Use National Language Support (NLS):
  - `GetDateFormat()`
  - `GetTimeFormat()`
  - `GetCurrencyFormat()`
  - `GetNumberFormat()`
  - `CompareString()`
### Internationalization Programming for Mobile Applications

#### Globalization – Surrogate pairs

<table>
<thead>
<tr>
<th>Palm 5</th>
<th>Windows Mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>No surrogate support</td>
<td>Windows GDI supports surrogate pairs</td>
</tr>
<tr>
<td></td>
<td>- <code>ExtTextOut()</code></td>
</tr>
<tr>
<td></td>
<td>- <code>DrawText()</code></td>
</tr>
<tr>
<td></td>
<td>- <code>CharNext()</code>/<code>CharPrev()</code> move by 16-bit code points, not by surrogates.</td>
</tr>
<tr>
<td></td>
<td>Sorting:</td>
</tr>
<tr>
<td></td>
<td>- Surrogates are sorted after other unicode code points; but before private user area.</td>
</tr>
<tr>
<td></td>
<td>- Single surrogate char is not supported</td>
</tr>
</tbody>
</table>
Internationalization Programming for Mobile Applications

Agenda

• Introduction for Mobile devices
• Globalization for Mobile devices
• Localization for Mobile devices
  – Mobile OS languages
  – System level support
• Tips & Tricks for Mobile application development
• Future trends in Mobile
• Q&A
# Internationalization Programming for Mobile Applications

## Localization – Mobile OS languages

<table>
<thead>
<tr>
<th>Palm 5</th>
<th>Windows Mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>English</td>
</tr>
<tr>
<td>French</td>
<td>French</td>
</tr>
<tr>
<td>German</td>
<td>German</td>
</tr>
<tr>
<td>Italian</td>
<td>Italian</td>
</tr>
<tr>
<td>Spanish</td>
<td>Spanish</td>
</tr>
<tr>
<td>Japanese (Sony Clie)</td>
<td>Japanese</td>
</tr>
<tr>
<td>Hebrew by 3rd party</td>
<td>Hebrew (by 3rd party)</td>
</tr>
<tr>
<td>Russian</td>
<td>Russian</td>
</tr>
<tr>
<td>Polish</td>
<td>Polish</td>
</tr>
<tr>
<td>Chinese-Simplified/Traditional</td>
<td>Chinese-Simplified/Traditional</td>
</tr>
<tr>
<td>Japanese</td>
<td>Japanese</td>
</tr>
</tbody>
</table>

and many more…
Internationalization Programming for Mobile Applications

Localization – System level support

**Palm 5**

Overlay Manager provides:

- a mechanism to simplify the process of localizing a Palm application.
- 3rd party localization company can localize the application with ease.
- A developer creates a primary PRC and overlay PRC files for target locales.

**Windows Mobile**

Multilingual User Interface (MUI) provides:

- A developer creates a single core binary with default system resource and resource mui files for target locales.
- Translations for additional languages can be done later.
- Allows users to switch between UI languages.
Internationalization Programming for Mobile Applications

Agenda

• Introduction for Mobile devices
• Globalization for Mobile devices
• Localization for Mobile devices
• **Tips & Tricks for Mobile application development**
• Future trends in Mobile
• Q&A
Internationalization Programming for Mobile Applications

Tips and Tricks for Mobile Application Development

Globalization Tips and Tricks
- Screen size layout
- Battery Life
- Flash Memory i/o
- Low signal and data coverage
- Phone call interruptions
- Responsiveness

Localization Tips and Tricks
- Limited screen size
- Shortcuts
Internationalization Programming for Mobile Applications

Agenda

• Introduction for Mobile devices
• Globalization for Mobile devices
• Localization for Mobile devices
• Tips & Tricks for Mobile application development
• Future trends in Mobile
• Q&A
Internationalization Programming for Mobile Applications

Future trends in Mobile

• Devices are getting faster and provide more memory for applications
• Convergence of phones, laptop and ultra portable devices
• More complex and sophisticated mobile applications
• New custom OS
Internationalization Programming for Mobile Applications

Q & A