



MOTOROLA

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Internationalization Programming for Mobile Applications

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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
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Internationalization Programming for Mobile Applications

Mobile phones

- Consumer mobile devices
- Prosumer 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
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Internationalization Programming for Mobile Applications

Globalization – Operating system

Palm 5

- Code Page OS
- Closed source
- Compact
- Single-tasking (multitask support)
- Event driven

Windows Mobile

- Unicode OS
- Windows CE base (Standard/Classic/Prof)
- 32-bit
- Multi-Threading
- Event driven
- Most of Win32 API plus unique APIs



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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()



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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")`



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Globalization – Character encoding conversions

Palm 5

Text and International Manager

- `TxtConvertEncoding();`

Windows Mobile

Use Windows API

- `MultiByteToWideChar();`
- `WideCharToMultiByte();`



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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()



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Globalization – Surrogate pairs

Palm 5

No surrogate support

Windows Mobile

Windows GDI supports surrogate pairs

- ExtTextOut()
- DrawText()
- CharNext()/CharPrev() move by 16-bit code points, not by surrogates.

Sorting:

- Surrogates are sorted after other unicode code points; but before private user area.
- Single surrogate char is not supported



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- **Localization for Mobile devices**
 - **Mobile OS languages**
 - **System level support**
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Localization – Mobile OS languages

Palm 5

English
French
German
Italian
Spanish
Japanese (Sony Clie)
Hebrew by 3rd party

Windows Mobile

English
French
German
Italian
Spanish
Russian
Polish
Chinese-Simplified/Traditional
Japanese
and many more...



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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.



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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



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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

