Localization, Internationalization, and Accessibility

Making software that works for everyone

It Is September 2016. Eat?

05 12 16
179 12

Still September 2016. Eat?

Definitions

- i18n (internationalization): modification of a software or related technologies so that a software can potentially handle multiple languages, customs, and so on in the world.
- L10n (localization): implementation of a specific language for already-internationalized software.
- G11n (globalization): both i18n and L10n.
- A11y (accessibility): making software suitable for people with disabilities

Today

- Requirements can be hard to elicit
- I will prove this to you via tricky examples from an important domain.
- Sometimes you need exactly the right example to reveal a requirement. "Normal" examples hide the requirements.
- As a software engineer, you should know about these specific issues.

Two Messages Today

- Requirements analysis can require detailed domain knowledge.
- Internationalization is hard but important, and specific domain knowledge is helpful.

A Proposal

- Scope: an email system
- Functional requirement: The system shall support use by all users on Earth.

Requirements

- Tell me what I need to do.

Translation

- Look up all the strings in a table. Easy, right?

Unicode

- You're not using ASCII, are you? 😬

Characters

- Requirement: "When a key is pressed on the keyboard, the character is inserted into the text buffer."
- In which languages is this the right requirement?
- And what language is this document in, anyway?
  - Spellchecking…

Chines

- Type “a”…

Capitalization

- "Users shall be able to make strings ALL-CAPS."
- Not every language uses capitalization.
- Some languages have special word-final character forms.
- What properties does the *capitalize* operation have?
- Convert to all-caps: straße.

Which One Is Back?

Let’s Make a Table.

A Clock

Back to Dates.

- Requirement: ISO 8601 dates?
- Unambiguous, yes.

Japanese Dates

- 平成20年12月31日 = Heisei-20 year, Dec. 31 (Wed)
- Equivalently, 平20/12/31
- Also, 2008年12月31日
- Emperor Hirohito died January 8, 1989.
- How do you write 100 years from now in the Imperial calendar?

Decimal Formats

- 3,14159265359…= π if you are in parts of Europe.
  - $3.000 = 10^3$

Keyboard Shortcuts

- Only work if you can type the characters…
- “Save” in French is “Enregistrer”

New	⌘N
Open...	⌘O
Open Recent	▶
Close	⌘W
Save...	⌘S
Duplicate	⇧⌘S
Rename...	
Move To...	
Revert To	▶
Export as PDF...	
Show Properties	⌥⌘P
Page Setup...	⇧⌘P
Print...	⌘P

Nouveau	⌘N
Ouvrir...	⌘O
Ouvrir l'élément récent	▶
Fermer	⌘W
Enregistrer...	⌘S
Dupliquer	⇧⌘S
Renommer...	
Déplacer vers...	
Revenir à	▶
Exporter au format PDF...	
Afficher les propriétés	⌥⌘P
Format d'impression...	⇧⌘P
Imprimer...	⌘P

New	⌘N
Open...	⌘O
Open Recent	▶
Close	⌘W
Save...	⌘S
Duplicate	⇧⌘S
Rename...	
Move To...	
Revert To	▶
Export as PDF...	
Show Properties	⌥⌘P
Page Setup...	⇧⌘P
Print...	⌘P

חדש	⌘N
פתח...	⌘O
פתח אחרונים	◀
סגור	⌘W
שמור...	⌘S
שכפל	⇧⌘S
שינוי שם...	
העבר אל...	
חזור לגירסה	◀
ייצא כ-PDF...	
הצג מאפיינים	⌥⌘P
הגדרת עמוד...	⇧⌘P
הדפסה...	⌘P

Time Zones

- What requirements are there for handling global times?

Culture

Free Photoshop PSD file download - Resolution 1280x1024 px - www.psdgraphics.com

Accessibility

https://devblogs.microsoft.com/xamarin/the-journey-to-accessible-apps/

Accessibility Advice

- High contrast; don't rely on color (1/12 of men are color blind)
- Enable keyboard-only use
- Make clickable areas large
- Linear layout (for screen readers)
- Test! Can you use the app with a screen reader?
- https://www.color-blindness.com/coblis-color-blindness-simulator/

For Web Sites

- Structure and organize with headers
- Use descriptive link text (not "click here for information about…")
- Use real text rather than images when possible
- Alternative text for images

Conclusions

- Requirements affect costs
- But determining requirements can require extensive domain knowledge
- Internationalization domain knowledge is important