Icon Standardization For Web Applications

Abstract

This research is derived from my talk at ⊕ ArabNet conference held in Beirut on 2013-03-20.

The aim of this research is to develop standards for representing icons in web applications. This means giving proposed icons in this research addresses in Miscellaneous Symbols and Arrows and Miscellaneous Tchnical unicode blocks. e.g.:

- 2BEA = RIGHT-POINTING MAGNIFYING GLASS WITH PLUS SIGN = Zoom in
- 2BEB = RIGHT-POINTING MAGNIFYING GLASS WITH MINUS SIGN = Zoom out
- 23FB = FOUR ANGULAR ARROWS FACING OUT = Full-screen
- 23FC = FOUR ANGULAR ARROWS FACING IN = Exit full-screen
-
- ... and so on.

Methedology

- First of all, I will show the solutions currently being used to display icons in web applications:
  - Whether using the usual image files,
  - Or using the embeded-fonts technology.
- Then I will form a model for a proposed web site, in order to summarize the icons needed for most web applications.
  In light of this model, I will go to propose a set of recomendations to:
  - Unicode organization to determine Unicode icons missing in the current version of Unicode,
  - and to W3C - The World Wide Web Consortium, to visualize a view for represnting icons using CSS.

Using Regular Image Files

The most popular solution used to display icons in web applications is called "CSS Sprites", which is to collect the various needed icons -of all sizes and colors- in a single regular image file. Here is a sample of Google icons stored in a single regular image file. Notice that icons are spreaded over the image canvas randomly.

Figure 1 - Google icons are stored in a one single image file
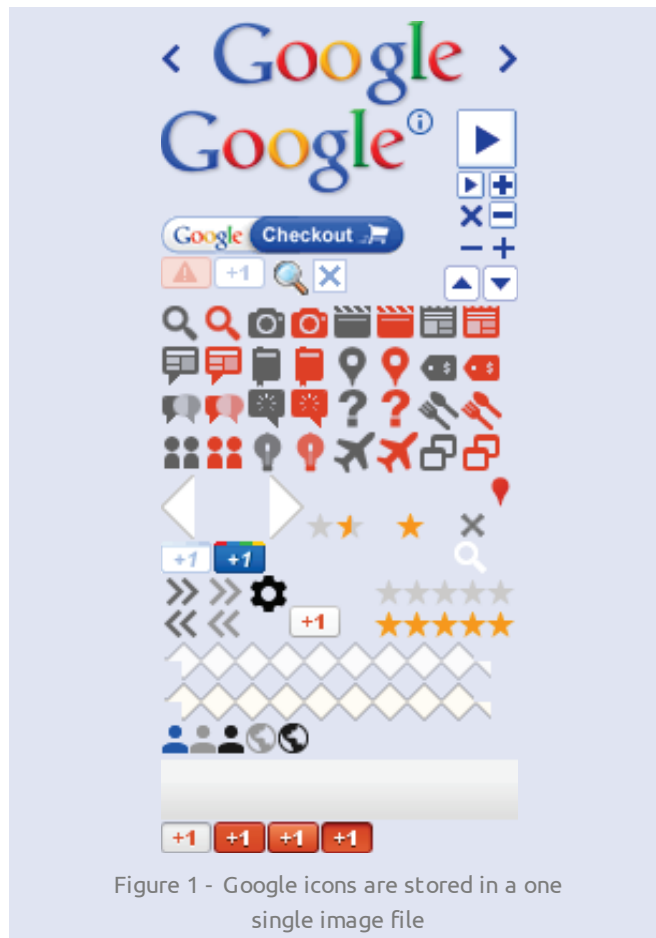
Using The Embed Fonts Technology

The embed fonts technology has paved a new way for web developers to represent icons using characters in the embedded fonts instead of the regular image formats used usually in the web, such as PNG, GIF... etc, which represents an important step for icon addressing in software industry generally, and in web development world particulary.

This step coincided with another important step as important as its previous one, which is the adoption of Unicode 6.0 for a broad spectrum of ⊕visual symbols (Emoji) and embedding it in its tables.

> ❝ Emoji are the ideograms or smileys used in Japanese electronic messages and webpages, whose use is spreading outside Japan. Originally meaning pictograph, the word emoji literally means "picture" + "character". ⊕Wikipedia, 2014

This step might lead us to a completely different usage of Emoji; providing a stable standard for addressing UI icons in software engineering. According to this version of Unicode, each popular UI icon had a stable address in Unicode blocks. For example; the muted speaker has the address `1F507`, and the magnifying glass has the address `1F50D`... and so on.

Figure 2 - Some of the new icons supported by Unicode 6 and implemented using RichStyle font

RichStyle font is an attempt to implement the idea of icons-addressing in the web pages through the Unicode 6.0 and above, but this project revealed a lack of some icons and visual symbols that are not addressed yet by Unicode. These icons are the ones that have a label in the preview page of RichStyle font.

Recomendations for Unicode: Missing Icons

In order to clarify this limitation I will try to develop a model for a generic web site covers the most popular requirements for a modern web site.
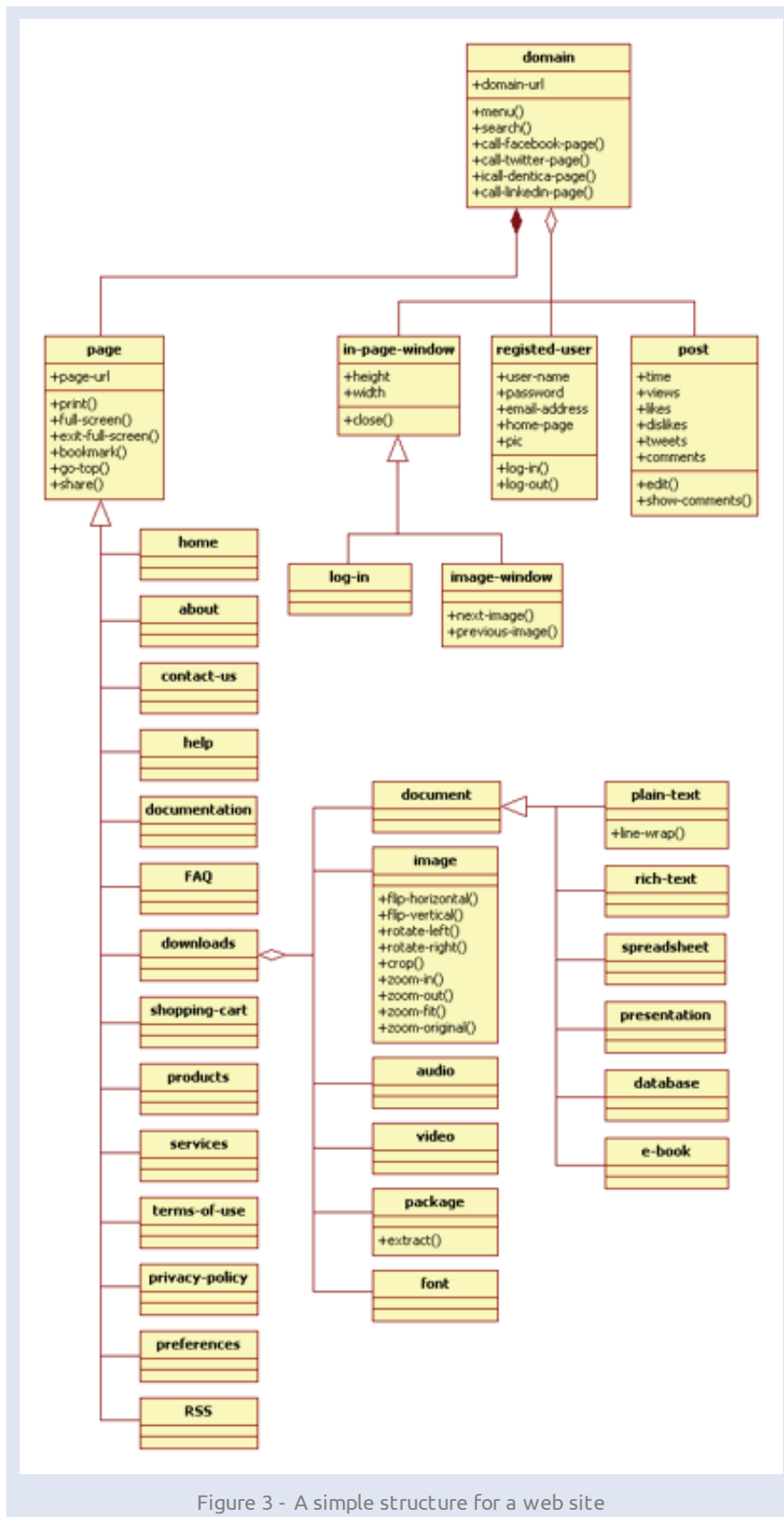
Figure 3 - A simple structure for a web site

Notice that:

- Every single class in this model needs an icon.
- Every single opertation in each class needs an icon too.
- Attributes do not need icons.

In the light of this model, and comparing to the icons supported in Unicode 7.0 beta, web developer

can use the following Unicode icons:

Table 1 - Avilable web Emoji icons for Unicode 7.0

Item	Code	Character	Names	Alias Names
about class	1F6C8		CIRCLED INFORMATION SOURCE	
audio class	1F3B5		MUSICAL NOTE	music, being in good mood, audio clip
bookmark operation	1F516		BOOKMARK	
close operation	1F5D9		CANCELLATION X	close
contact-us class	2709		ENVELOPE	
documentation class	1F4D6		OPEN BOOK	read operator's manual
document class	1F5CE		DOCUMENT	
downloads class	2B8B		DOWNWARDS BLACK CIRCLED WHITE ARROW	
e-book class	1F56E		BOOK	
edit operation	270E		LOWER RIGHT PENCIL	
flip-horizontal operation	2B0C		LEFT RIGHT BLACK ARROW	flip-horizontal
flip-vertical operation	2B0D		UP DOWN BLACK ARROW	flip-vertical
go-top operation	2B89		UPWARDS BLACK CIRCLED WHITE ARROW	
home class	1F3E0		HOUSE BUILDING	
image class	1F5BC		FRAME WITH PICTURE	~~art~~, graphic document
line-wrap operation	2B92		NEWLINE LEFT	
log-in operation	1F512		LOCK	
log-out operation	1F513		OPEN LOCK	
plain-text class	1F5B9		DOCUMENT WITH TEXT	

preferences class	2699	⚙	GEAR	tchnology, tools, <u>preferences</u>
presentation class	1F5BB	📽	~~DOCUMENT WITH PICTURE~~ <u>BLACKBOARD WITH STATICAL SHAPES</u>	<u>presentation</u>
print operation	1F5A8	🖨	PRINTER	
privacy-policy class	1F512	🔒	LOCK	<u>privacy</u>
products class	1F4E6	🎁	PACKAGE	<u>commodities</u>
rich-text class	1F5BA	📄	DOCUMENT WITH TEXT AND PICTURE	
rotate-left operation	2B10	⬐	LEFTWARDS ARROW WITH TIP DOWNWARDS	<u>rotate-left</u>
rotate-right operation	2B0E	⬎	RIGHTWARDS ARROW WITH TIP DOWNWARDS	<u>rotate-right</u>
search operation	1F50D	🔍	LEFT-POINTING MAGNIFYING GLASS	search
services class	1F527	🔧	WRENCH	<u>service</u>
show-comments operation	1F4AC	💬	SPEECH BALLOON	comic book conversation bubble, <u>comments</u>
terms-of-use class	2696	⚖	SCALES	legal term, jurisprudence
video class	1F39E	🎞	FILM FRAMES	film clip

> ℹ Underlined term means proposal. Notice also that I redfined `1F5BB` as an icon for presntation document.

Whilest, web developer still not find matching unicode addresses for the following classes and operations, which means it need to be added in the official/final Unicode 7.0 release:

Table 2 - Propsed web Emoji icons for Unicode 7.0

Item	Propsed Code	Character	Names	Alias Names
full-screen operation	23FB	⤡ ⤢	FOUR ANGULAR ARROWS FACING OUT	full-screen
exit-full-screen operation	23FC	⤡ ⤢	FOUR ANGULAR ARROWS FACING IN	exit full-screen
package class	2BE0		TIED FOLDER	archive,

				compressed document
spreadsheet class	2BE1		DOCUMENT WITH TABLE OR BAR CHART	spreadsheet
database class	2BE2		DRUM	database
FAQ class	2BE3		TWO SPEECH BALLOONS WITH QUESTION MARK	FAQ
help class	2BE4		LIFE RAFT	help
RSS class	2BE5		RSS SYMBOL	
shopping-cart class	2BE6		SHOPPING CART	
crop operation	2BE7		CROP SYMBOL	crop
menu operation	2BE8		THREE HORIZENTAL LINES	menu
share operation	2BE9		THREE NODES CONNECTED USING TWO LINES	share
zoom-in operation	2BEA		RIGHT-POINTING MAGNIFYING GLASS WITH PLUS SIGN	zoom in
zoom-out operation	2BEB		RIGHT-POINTING MAGNIFYING GLASS WITH MINUS SIGN	zoom out
zoom-fit operation	2BEC		RIGHT-POINTING MAGNIFYING GLASS WITH FRAME	fit
zoom-original operation	2BED		RIGHT-POINTING MAGNIFYING GLASS WITH 1 NUMBER	original size

Recomendations for W3C: Representing Icons Using CSS

W3C standards ⊕ stated that icons should be represnted using the following syntax:

```
<menu>
        <menuitem icon='page-about.png'/>
        <menuitem icon='domain-settings.png'/>
</menu>
```

Unfortunately, this standard will not allow you to implement the popular ways used nowadays to represent icons, whether through CSS Sprites or embedded fonts technology, it's a backward movement, and it means representing each icon using an independent image file, and therefore fatiguing the network with too many request for downloading a large amount of images.

As an alternative, I suggest representing icons using CSS pseudo element, not as an HTML element's

attribute. The reason for this is that icon -even though it represents an attribute- but:

- First of all; it's a presentation attribute, and therefore must be represented using CSS rather than HTML,
- Secondly, it's a rich attribute; an attribute needs attributes. These kind of attributes are usually represented using something called Pseudo Element.

practically; in the HTML page, we'll use the element `MenuItem` with a class name, and in CSS file we'll use a pseudo element called `:icon`, to be able to adjust all the presentation attributes of this icon, just like content, font name, font size, and position.

```
<menu>
        <menuitem class='page-about'/>
        <menuitem class='domain-settings'/>
</menu>
```

```
.page-about:icon {
        content: char(i);
        font: 10pt RichStyle;
        icon-position: top;
}

.domain-settings:icon {
        content: char(⚙);
        font: 10pt RichStyle;
        icon-position: top;
}
```

Icon Standardization for Desktop Applications

A few years ago, Tango Icons project have tried to set a standard for icons naming for Linux, in order to be addressed in a standard way. However, I think that Unicode 6.0+ now represents a reliable alternative to be adopted as a standard for addressing icons within the software process.

Figure 4 - Unicode 6.0 icons naming vs. Tango icons naming
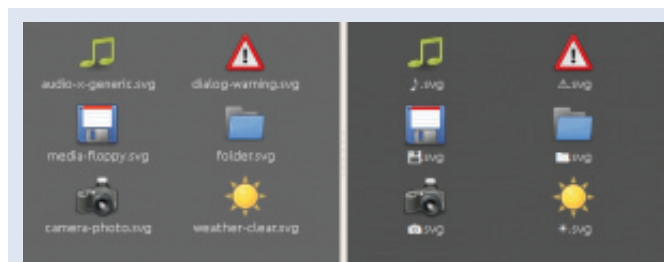
Here is an express view of proposed icons for desktop and mobile icons, inspired by Unicode 7.0 Beta itself.

Figure 5 - Proposed Emoji icons for desktop, and mobile environments

Conclusion

- Some Emoji icons for web environment need redefining, as shown in Table 1.
- Some Emoji icons for web environment are missed, and need to be added to Unicode as shown in Table 2.

- Some Emoji icons for desktop and mobile environments are missed, and need to be added to Unicode as shown in Figure 5.
- For W3C, icons should be defined using CSS; not HTML, as Pseudo Elements, i.e. `:icon{...}`

References

- Unicode 7.0 Beta Symbols:
    - Dingbats:
      ⊕ http://www.unicode.org/charts/PDF/Unicode-7.0/U70-2700.pdf
    - Emoticons:
      ⊕ http://www.unicode.org/charts/PDF/Unicode-7.0/U70-1F600.pdf
    - Miscellaneous Symbols and Arrows:
      ⊕ http://www.unicode.org/charts/PDF/Unicode-7.0/U70-2B00.pdf
    - Miscellaneous Symbols and Pictographs:
      ⊕ http://www.unicode.org/charts/PDF/Unicode-7.0/U70-1F300.pdf
    - Miscellaneous Technical:
      ⊕ http://www.unicode.org/charts/PDF/Unicode-7.0/U70-2300.pdf
    - Supplemental Arrows-C:
      ⊕ http://www.unicode.org/charts/PDF/Unicode-7.0/U70-1F800.pdf
    - Transport and Map Symbols:
      ⊕ http://www.unicode.org/charts/PDF/Unicode-7.0/U70-1F680.pdf
- RichStyle font (list of the icon designers including ⊕The Noun Project designers): ⊕ http://richstyle.org/font.php