

Platform Guidelines and Conventions

SWEN-444

The Platforms

- Desktops
- Web browsers
- Small screen devices
 - Smart phones
 - Smart devices (IoT)
 - Wearable devices
 - Embedded devices
 - Kiosks
- Nongraphic interface technologies

Platforms = {hardware, software, standards, conventions, applications, design patterns}

Platforms and UX Design

- **Foundational design principles and guidelines** underlie and **still apply**
- **Plus** adhere to **platform specific** guidelines, conventions, standards, and constraints
- Utilize platform specific style guides, design patterns, frameworks, API libraries, development environments and tools
- Accommodate **user expectations** for the platform's UX behavior
- Let's look at two examples ...
 - Web apps
 - Apps on small screens

What is the Website Purpose?

- **Informational sites:**
 - **Balance display density** of useful information with **learnability** for infrequent users
 - **Full screen content** with **good page navigation**
- **Transactional sites**
 - Properties of **informational** sites plus **functional behaviors**
 - **Efficient** structured **navigation** based on an “information architecture” for **page content organization**
- **Web application sites:**
 - **Desktop-like** more **complex** applications
 - “**Views**” more than “**pages**” – not a “document” metaphor
 - **Asynchronous** frontend to backend communications

Design to Accommodate User Behavior

- Do users **carefully read** or **scan and click**?
 - We **don't read** pages, **we scan** them
 - We don't make optimal choices, we **choose** the **first reasonable option**
 - Little downside for wrong guesses
 - We **muddle through** without always understanding how things work
- Emphasize the use of **cognitive affordances**

Browse or Search?

- **Browsing**
 - Versus the real world – **no sense of scale, direction, or location**
- **Searching** - users are really not that good at forming effective queries
- **So help the user** find the desired page
 - Auto complete
 - Auto suggest to disambiguate
 - Suggest keywords

Some Web Design Guidelines

Home Page	Page Layout	Navigation	Information Presentation
<ul style="list-style-type: none">• Sites value and purpose• Positive first impression• Limit to one screen• Keep it simple• Access to site's major features	<ul style="list-style-type: none">• Consistent grid – visual hierarchy, element alignment• Header and footer boundaries	<ul style="list-style-type: none">• Page navigation supports associative information architecture• Primary(global) sections at top, secondary(local) on left, “utilities” at bottom• A way to search• Page and link names match• Navigation markers (e.g., breadcrumbs)• No dead end pages• List of contents for long scrollable pages• Good link affordances	<ul style="list-style-type: none">• Simple background images for readability• Distinguish important images from aesthetics• Have clear and useful reasons for using multimedia

Single Page Web APPs

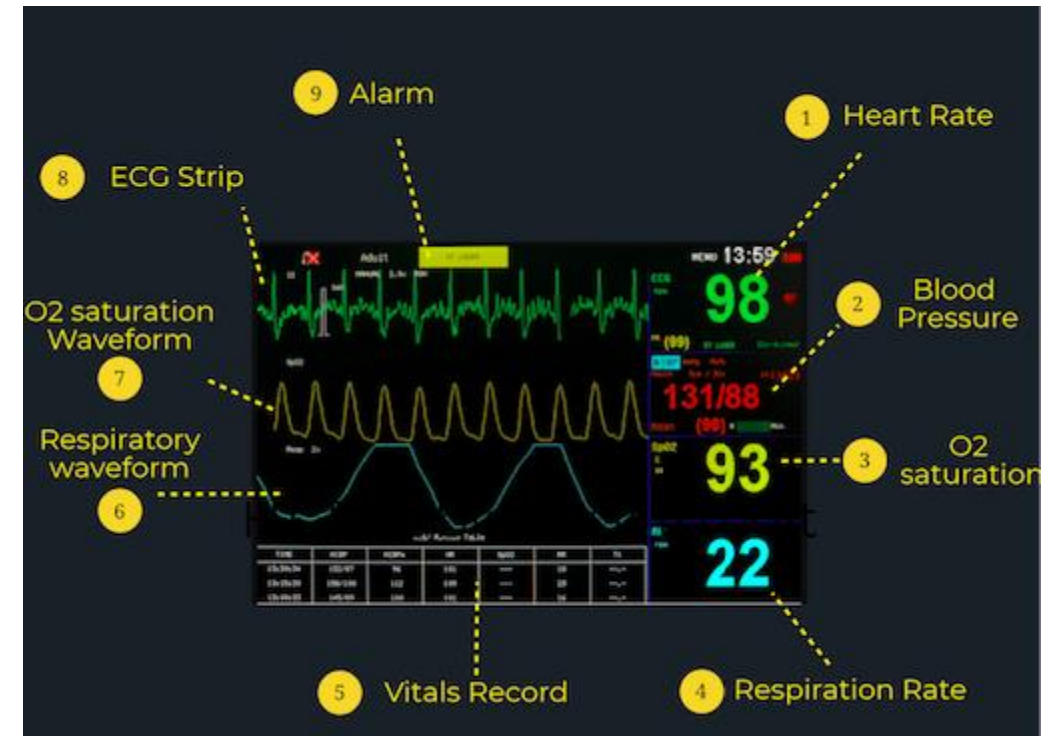
- What are they – **single** [long] scrollable **page** with associated **client side code** for **server side data access**
- More appropriate for smaller sites
- **Claim** is **simpler** user navigation and understanding, simpler design, deployment, and maintenance
- However ...
 - May be **more complex** – e.g., may have to duplicate in code existing browser services such as history for back button refresh
 - May be **performance tradeoffs** – initial load latency, variable client performance
 - More code means more opportunity for bugs
 - Less effective search engine optimization

Small Screens

- We will focus on consumer **mobile devices** such as smartphones and tablets
- However, there is another large category of **embedded devices** to be considered as well

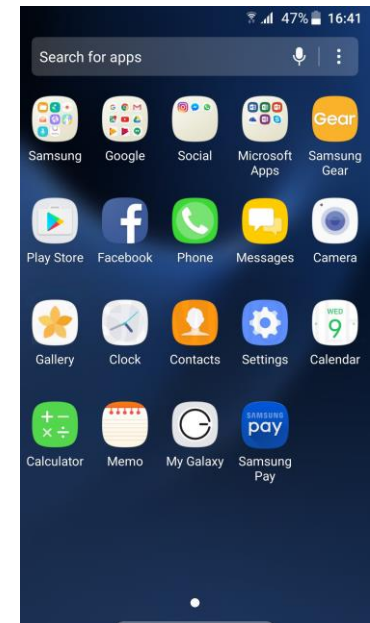
Embedded Devices

- Very specific work activities and work environment
- Very specific hardware and software constraints
- Consequently, more **custom UX design** is required
- Emphasis on providing **good cognitive and physical affordances**
- Emphasis on foundational design principles and guidelines
- Other human factors are important such as user safety



Mobile Device Usability Problems (Opportunities)

- **Small screens** (inherent)
- **Awkward input** (“fat finger syndrome”)
- **Network performance and reliability**, especially for downloads (but getting better)
- **Native apps versus web apps**



Web App vs. Native App?

- **Web App**
 - Develop once, lower support costs
 - Cross device platform support
 - Dependent on a network connection
 - May be functional limitations
- **Native app**
 - More expensive to develop and support
 - Not portable
 - Better performance and security
 - Use local hardware
 - Better UX?
 - App store distribution
- **Hybrid app?** Native app accesses website data

Small Screen Design Guidelines

Screen Layout	Navigation	Information Presentation
<ul style="list-style-type: none">• To preserve screen real estate ...<ul style="list-style-type: none">• Use transparency; e.g., widgets• Vertical or horizontal screen navigation• Use images sparingly• Minimize use of footers, breadcrumbs, progress indicators, menu bars• Most frequently used controls at bottom• Consider the physical feel – ergonomics,• The use of the (one) hand – fingers• Finger tip target size guides (e.g., iPhone 44 pixels)	<ul style="list-style-type: none">• Limit navigational hierarchy, especially global to contextual transition• Apply Fitt's Law: large objects for navigation (touch) versus hypertext• Apply screen layout design patterns; E.g....<ul style="list-style-type: none">• Carousels• Stacks• Lists•	<ul style="list-style-type: none">• Rapid serial presentation of text, important information first (progressive disclosure);• Minimize extended scrolling or paging• Optimize<ul style="list-style-type: none">• 14pt fonts• Organize text with headings• Minimize search to avoid complex data entry (voice okay)

Responsive Web Design

- **One interface design does not fit all screens** for optimal user interaction
- Create a **single website** that works effectively on the **desktop** as well as **mobile devices**



Responsive Web Design

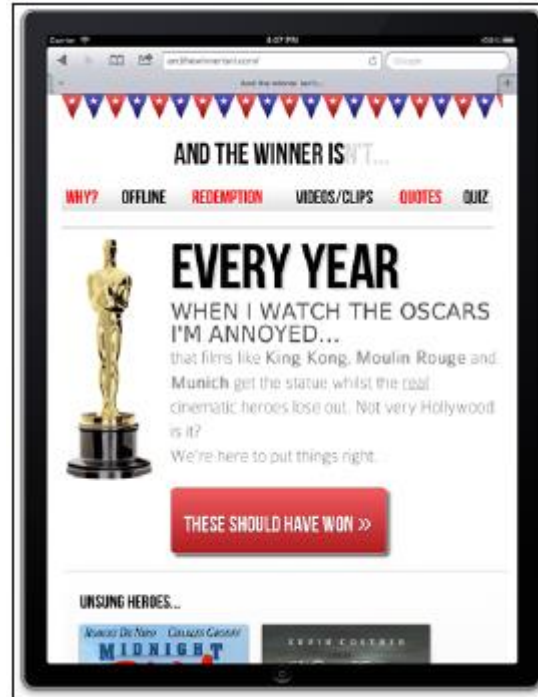
- Responsive websites **reorganize themselves** automatically **according to the device displaying them**
 - **Desktops/laptops** get the full experience – video, images, animation
 - **Smartphones** get a simplified experience that works quickly – app-like
 - **Tablets** – something in between
- **More than altering the layout** based on viewport* size
- **Invert the process of web design**
 - **Design for the smallest viewport first**
 - **Progressively enhance** the design and content for larger viewports

* Viewport is display area versus physical screen size

Responsive Design Example



iPhone



iPad



Desktop browser

<http://www.andthewinnerisnt.com/>

Check out the CSS File – look for @media

Responsive Design Guidelines

Group similar devices by screen size/media type to establish target size “breakpoints” for design

For each media type, identify **unique properties** and **shared properties** that will vary by value (e.g. font size)

Design **adaptive layouts** – e.g., large menu bar on the desktop, dropdown menu on smartphone

Use “fluid grids” - **proportional layouts** scaled by screen dimensions (scale factor)

Tailor the amount and type of **content** by screen size

Use CSS3 (@media query) and HTML5 encoding

Cascading Style Sheet (CSS) Media Queries

- **CSS3 “@media” query** – query “screen” as media type with **screen properties** such as **size** and **resolution**
 - All following style sheet rules apply to that media type
 - **Substitute** different **layout commands** or a **tailored CSS file**
 - **Scale** to match device screen resolution and size
 - **Transform** screen layout – e.g., number of columns of content
 - **Adjust object size** such as for links (Fitt’s Law)
 - **Adjust typography** – e.g., font size, line width and length

```
@media print {  
  body { font-size: 10pt }  
}  
@media screen {  
  body { font-size: 13px }  
}  
@media screen, print {  
  body { line-height: 1.2 }  
}
```

```
body {  
  background-color: grey;  
}  
@media screen and (max-width: 960px) {  
  body {  
    background-color: red;  
  }  
}  
@media screen and (max-width: 768px) {  
  body {  
    background-color: orange;  
  }  
}  
@media screen and (max-width: 550px) {  
  body {  
    background-color: yellow;  
  }  
}  
@media screen and (max-width: 320px) {  
  body {  
    background-color: green;  
  }  
}
```

https://www.w3schools.com/css/css3_mediaqueries.asp

Gotcha – Cross Browser

Compatibility and/or Obsolescence

- **Graceful degradation – design for modern browsers** but assure a useful experience on older browsers
- **Progressive enhancement – start with standard markup for all browsers** and enhance the experience for more capable browsers – **recommended**
- Many tools available to test cross browser compatibility

Web App References

- “Research-Based Web Design & Usability Guidelines”, U.S. Department of Health and Human Services;
www.usability.gov
- “Don’t Make Me Think”, Steve Krug
- “Designing for Conversion; Evaluating decision making through HFI’s PET Design™”, Mona Patel
- “About Face”, Cooper, Reimann

Mobil App References

- Lari Kärkkäinen and Jari Laarni, "Designing for Small Display Screens", NordiCHI, October 19-23, 2002
- uxatters.com: [Usability for Mobile Devices](#)
- Josh Clark, *Tapworthy – Designing Great iPhone Apps*, O'Reilly Media, 2010
- Alan Cooper, Robert Reimann, et al, "About Face", Wiley, 2014

Responsive Design References

- Marcotte, Ethan (May 25, 2010). ["Responsive web design"](#). *A List Apart*
- Foster, Aidan. <http://responsivedesign.ca/blog/responsive-web-design-what-is-it-and-why-should-i-care>
- Frain, Ben, *Responsive Web Design with HTML5 and CSS3* (eBook)