## iBooks

Building interactive books with EPUB 3 and JavaScript

Session 509

**Casey Dougherty** 

iBookstore

These are confidential sessions—please refrain from streaming, blogging, or taking pictures

Create beautiful books with HTML5, CSS3, and EPUB

• EPUB 2.0.1



- EPUB 2.0.1
  - Flowing book



- EPUB 2.0.1
  - Flowing book
  - Fixed Layout books



- EPUB 2.0.1
  - Flowing book
  - Fixed Layout books
  - Embedded video and audio

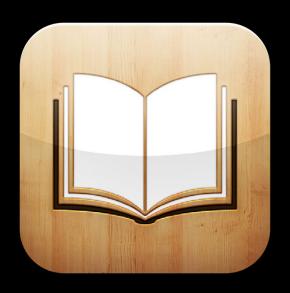


- EPUB 2.0.1
  - Flowing book
  - Fixed Layout books
  - Embedded video and audio
  - Read aloud



- EPUB 2.0.1
  - Flowing book
  - Fixed Layout books
  - Embedded video and audio
  - Read aloud
- Download from Apple Developer Center
  - developer.apple.com/videos/wwdc/2011/

# A Year in iBooks



# A Year in iBooks



# A Year in iBooks



# Why EPUB?

- Flowing and fixed layout
  - Media
  - Fonts
  - Interactivity
- Read aloud
- Supported on iPad, iPhone, and iPod touch
- Standard technologies
- Open standard

#### What You Will Learn

- Foundations of EPUB 3
- Adding interactivity to EPUB using JavaScript
- Development tools

# EPUB 3 The basics

Casey Dougherty iBookstore

# **EPUB 3 Bootcamp**

- Get up to date on EPUB 3 anatomy
- Create pop-ups in iBooks

# **EPUB Building Blocks**

- EPUB is web technology
  - HTML, CSS, JS, etc.
- Zipped, with ".epub" extension



# **EPUB Structure e**PUB





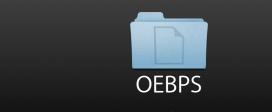




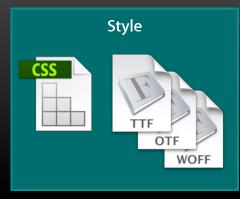


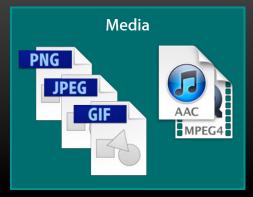




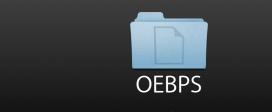




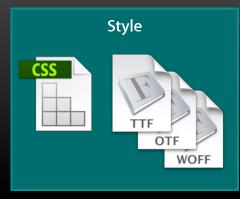


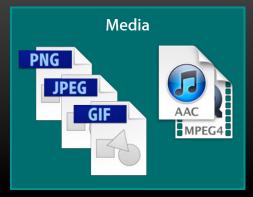








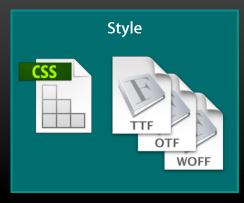


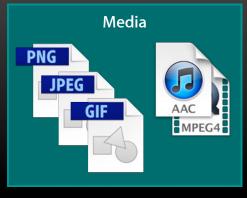


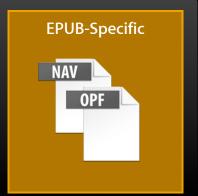












## Information About Your EPUB

#### package.opf

- Package Version
  - Identifies EPUB version
- Metadata
  - Title, language, identifier, date
- Manifest
  - List of all files in the EPUB
- Spine
  - Lists the content in a linear reading order

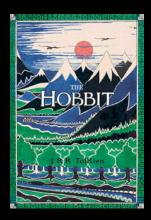


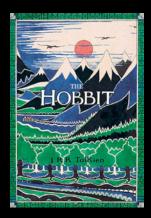
# **Package Version**

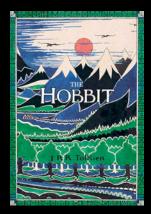
```
<package version="2.0" xmlns="http://www.idpf.org/2007/opf"
unique-identifier="uid">
```

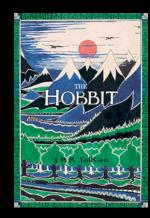
# **Package Version**

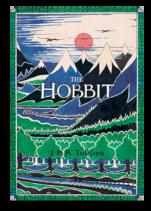
```
<package version="3.0" xmlns="http://www.idpf.org/2007/opf"
unique-identifier="uid">
```











#### Manifest

```
<manifest>
  <item id="pg-1" href="chapter1.xhtml" media-type="application/xhtml+xml"/>
  <item id="css1" href="stylesheet.css" media-type="text/css"/>
  <item id="font" href="fonts/font.ttf" media-type="application/x-font-ttf"/>
  <item id="toc" href="toc.xhtml" media-type="application/xhtml+xml"
    properties="nav"/>
  <item id="img1" href="cover-img.jpg" media-type="image/jpeg"
    properties="cover-image"/>
  </manifest>
```

#### Manifest

#### Manifest

```
<manifest>
  <item id="pg-1" href="chapter1.xhtml" media-type="application/xhtml+xml"/>
  <item id="css1" href="stylesheet.css" media-type="text/css"/>
  <item id="font" href="fonts/font.ttf" media-type="application/x-font-ttf"/>
  <item id="toc" href="toc.xhtml" media-type="application/xhtml+xml"
    properties="nav"/>
  <item id="img1" href="cover-img.jpg" media-type="image/jpeg"
    properties="cover-image"/>
  </manifest>
```

# Spine

• List content documents in linear reading order

# Spine

• List content documents in linear reading order

## Spine

• List content documents in linear reading order



### Spine

• List content documents in linear reading order

```
<spine>
<itemref idref="chapter1"/>

<itemref idref="chapter2"/>
<itemref idref="chapter3"/>
<itemref idref="chapter4"/>
</spine>

<itemref idref="chapter4"/>
</spine>
```

### Spine

• List content documents in linear reading order

### .opf XML File

- Package Version
  - Identifies EPUB version
- Metadata
  - Title, language, identifier, modified date
- Manifest
  - List of all files in the packageNew attribute: properties
- Spine
  - List all XHTML in linear reading order

#### toc.xhtml

- Replaces the EPUB 2's .NCX file
- Information about navigating an EPUB
  - Table of contents
  - Landmarks: Guide to key files
  - Page-list: Custom page numbers



## Structuring Navigation

#### <nav> element

Contains a navigation hierarchy using HTML lists

## Identifying Navigation epub:type

- Provides additional semantic meaning to any element
- Supports a variety of preexisting values
- epub: type attributes for navigation
  - toc
  - landmarks
  - page-list

## Identifying Navigation epub:type

- Provides additional semantic meaning to any element
- Supports a variety of preexisting values
- epub: type attributes for navigation
  - toc
  - landmarks
  - page-list

```
<nav epub:type="toc">

      <a href="link.xhtml">Text</a>
      <a href="link.xhtml">Text</a>

</nav>
```

## Identifying Navigation epub:type

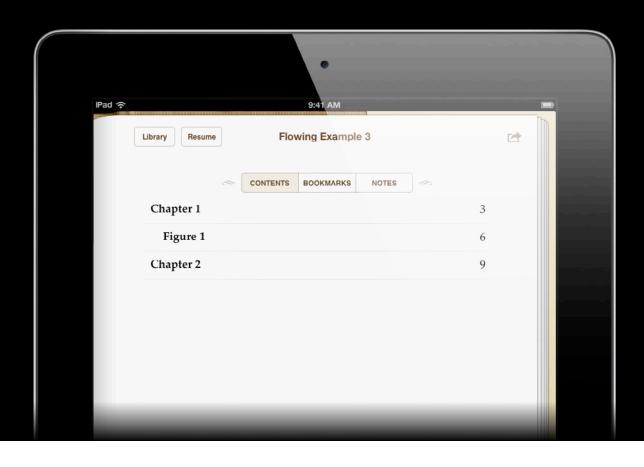
- Provides additional semantic meaning to any element
- Supports a variety of preexisting values
- epub: type attributes for navigation
  - toc
  - landmarks
  - page-list

```
<nav epub:type="toc">

    <a href="link.xhtml">Text</a>
    <a href="link.xhtml">Text</a>

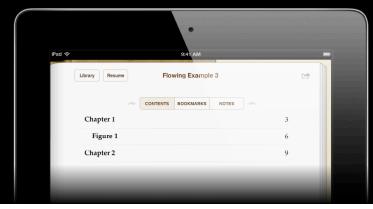
</nav>
```

## Table of Contents EPUB navigation



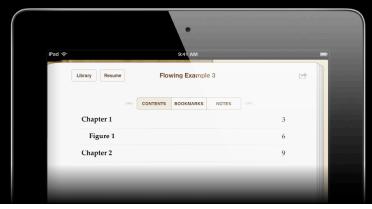
#### **Table of Contents**

#### **EPUB** navigation

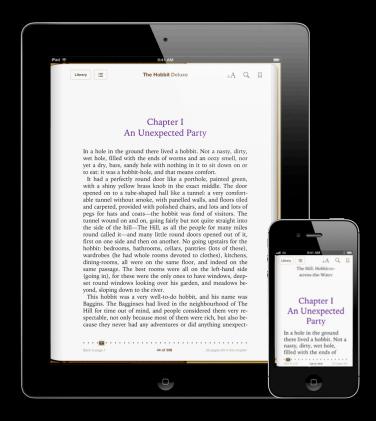


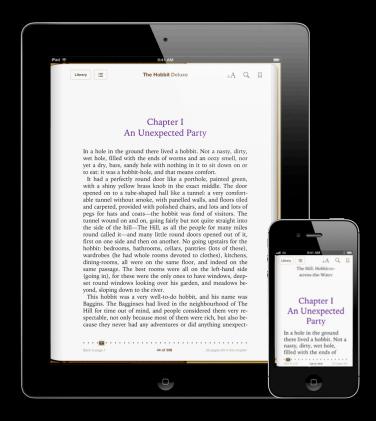
#### **Table of Contents**

#### **EPUB** navigation

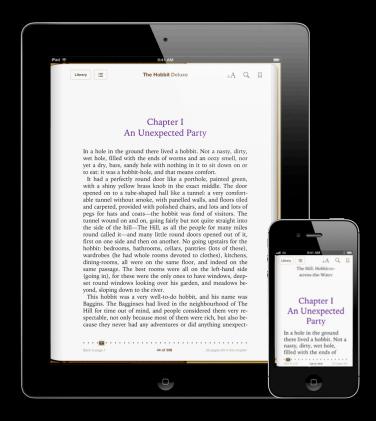


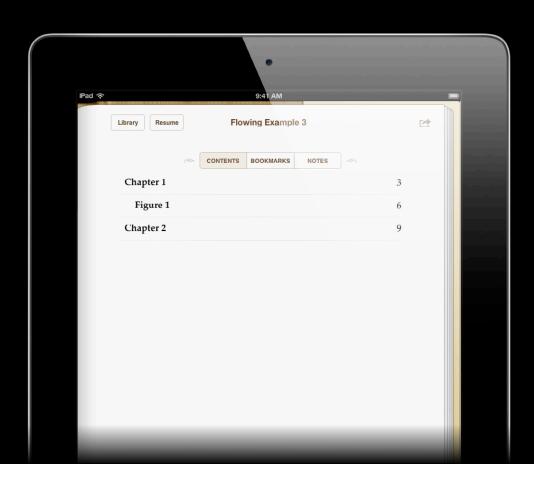
- Replaces the EPUB 2 guide
- Identifies milestones in your book
- Referenced when cutting samples for the iBookstore
- Defines the start page

















#### toc.xhtml

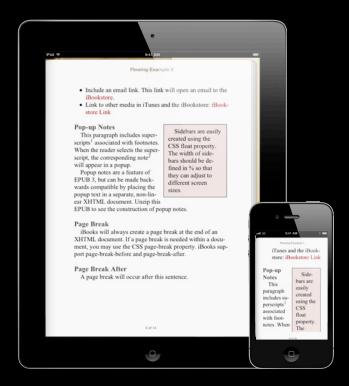
- Information about navigating an EPUB
  - Table of contents
  - Landmarks: Guide to key files
  - Page-list: Custom page numbers
- Uses HTML5 <nav> element
- Uses EPUB 3 epub: type attribute

## Add Meaning and Functionality epub:type

• Adds additional semantic meaning to the element on which it appears

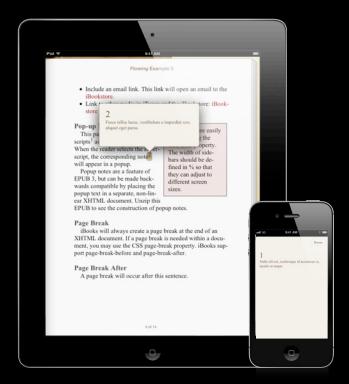
## Pop-Up Notes epub:type

 Work on iPad, iPhone, and iPod touch



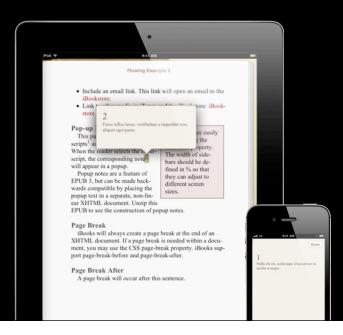
## Pop-Up Notes epub:type

 Work on iPad, iPhone, and iPod touch



## Pop-Up Notes epub:type

```
<sup>
    <a href="chapter.xhtml#myNote" epub:type="noteref">1</a>
</sup>
<aside id="myNote" epub:type="footnote">Text in popup</aside>
```



### **EPUB 3 Summary**

- Building blocks of an EPUB
  - Web technology
- Structure of an EPUB
  - OPF
  - Nav
- Pop-ups in iBooks

# Fun with EPUB JavaScript interactivity

Jonathan Ng iBookstore



# What Is Interactivity?





# **Fusing User Interaction with Feedback**

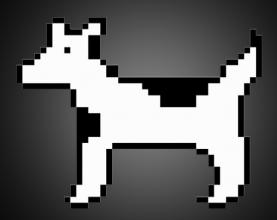
# **Fusing User Interaction with Feedback**

- JavaScript
  - Supported since iBooks 1.5
  - Officially supported in EPUB 3

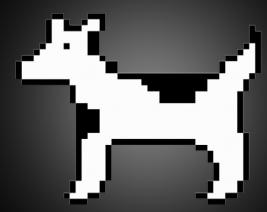
### Fusing User Interaction with Feedback

- JavaScript
  - Supported since iBooks 1.5
  - Officially supported in EPUB 3
- Components of interactivity
  - User interaction
  - Media integration
    - Audio
    - Video
    - CSS animations

# **CSS** Animations and Interactivity

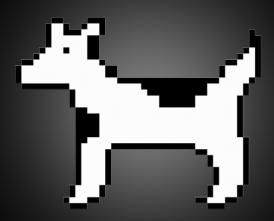


**CSS Animation** 

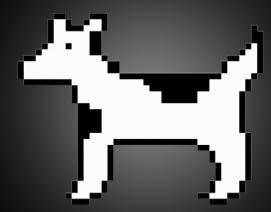


JavaScript triggered animation

# **CSS** Animations and Interactivity

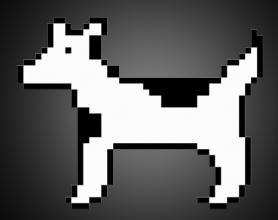


**CSS Animation** 

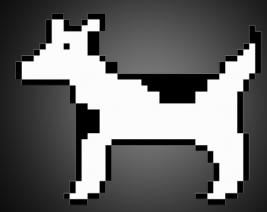


JavaScript triggered animation

# **CSS** Animations and Interactivity



**CSS Animation** 



JavaScript triggered animation

# **Animations Are the Core of Interactivity**

# **Animations Are the Core of Interactivity**

Combine animations for compound effects

### **Animations Are the Core of Interactivity**

- Combine animations for compound effects
- Use JavaScript to control sequences
  - Modify class names
  - Respond to classes with CSS

```
/**
* iBook JS Framework
* Compatibility: iBooks 1.5+
* Copyright © 2009-2011 Apple Inc. All rights reserved.
**/
/**
   @name iBook
* @namespace
  Top-level object containing some core constants providing information about
the environment.
*/
var iBook = {};
/**
* Indicates the version of iBook JS.
* @constant
   @type String
*/
iBook.VERSION = '1.0';
/**
* Indicates whether the platform is an iBook.IS_IPAD.
* @constant
* @type bool
*/
iBook.IS TPAD = (navigator.platform == 'iPad'):
```

```
this.xTap = Math.abs(this.startX - event.clientX) < iBook.TAP_THRESHOLD ||
event.pageX == 0;
  this.yTap = Math.abs(this.startY - event.clientY) < iBook.TAP_THRESHOLD ||
event.pageY == 0;
  if (this.xTap && this.yTap){
    event.preventDefault();
    this.el.toggleClassName(iBook.ACTIVE_CSS_CLASS);
  };
};
/**
    Event triage.
 */
iBooksToggleableController.prototype.handleEvent = function(event){
  switch(event.type){
    case iBook.START EVENT:
      this.touchStart(event);
      break;
    case iBook.END EVENT:
      this.touchEnd(event);
      break;
};
```



# iBook.js

JavaScript interactivity, simplified

# iBook.js Simplifies Your Life

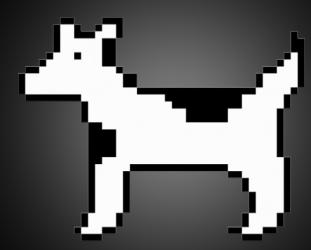
- Apple's framework
- Available now, for everybody
- Simplifies common tasks
- Unobfuscated
- Optional

### **DOM Load-Based Actions**

• CSS class: build-in
 <body class="build-in">

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• CSS class: build-in
 <body class="build-in">



## **Deferring Events After Content Load**

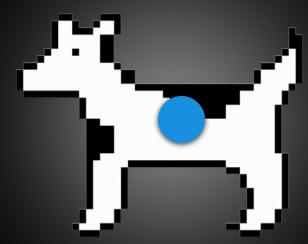
- Timeout
- CSS class: ibooks-deferred-event
  - 1000ms by default
  - Adjust with HTML attribute "data-ibooks-deferred-event-delay"

```
<div class="ibooks-deferred-event"></div>
```

# **Toggling Elements**

- CSS class: ibooks-toggleable
- On touch, toggles CSS class: active

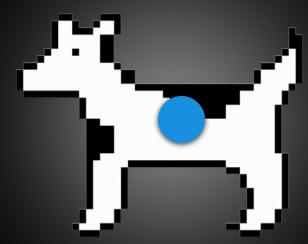
```
<img class="ibooks-toggleable" src="assets/clarus.png" alt="Clarus" />
```



# **Toggling Elements**

- CSS class: ibooks-toggleable
- On touch, toggles CSS class: active

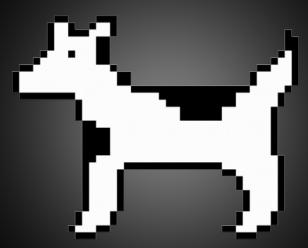
```
<img class="ibooks-toggleable" src="assets/clarus.png" alt="Clarus" />
```



## **Toggling Elements**

- CSS class: ibooks-toggleable
- On touch, toggles CSS class: active

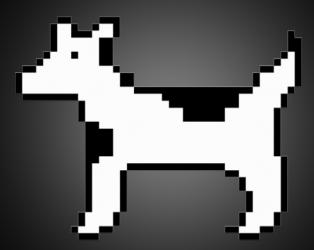
```
<img class="ibooks-toggleable" src="assets/clarus.png" alt="Clarus" />
```



# Leveraging Touch for Draggable Objects

- Easily add touch support
- CSS class: ibooks-draggable

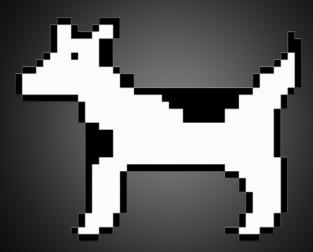
```
<div class="ibooks-draggable"></div>
```



# Leveraging Touch for Draggable Objects

- Easily add touch support
- CSS class: ibooks-draggable

```
<div class="ibooks-draggable"></div>
```



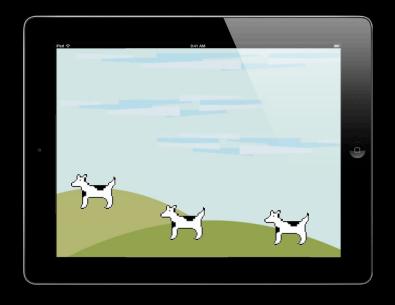
### **Duplicating Elements**

- Adds elements to DOM on touch
- CSS class: ibooks-stampable
  - Apply to a parent container
- On touch <code>ibook.js</code> appends an empty div element with the CSS class <code>stamp</code> within the parent container



### **Duplicating Elements**

- Adds elements to DOM on touch
- CSS class: ibooks-stampable
  - Apply to a parent container
- On touch <code>ibook.js</code> appends an empty div element with the CSS class <code>stamp</code> within the parent container



- Requires a SVG path to define a valid touch area
  - Format for 2D vector graphics
  - SVG is especially useful for defining irregular shapes



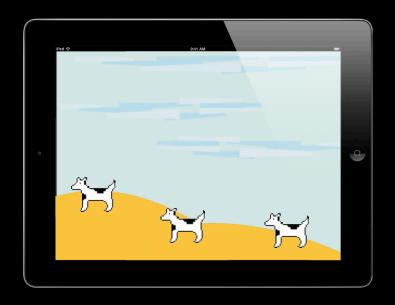
- Requires a SVG path to define a valid touch area
  - Format for 2D vector graphics
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  - Format for 2D vector graphics
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- Requires a SVG path to define a valid touch area
  - Format for 2D vector graphics
  - SVG is especially useful for defining irregular shapes



### Using Elements to Trigger Audio Playback

- CSS class: ibooks-media-audio
  - Define the source: data-ibooks-audio-src
- But, what about the <audio> element?
  - Trigger audio playback using any HTML element
  - ibook.js manages the audio playback via JavaScript

```
<img class="ibooks-media-audio" data-ibooks-audio-src="audio/moof.m4a" />
```



### Using Elements to Trigger Audio Playback

- CSS class: ibooks-media-audio
  - Define the source: data-ibooks-audio-src
- But, what about the <audio> element?
  - Trigger audio playback using any HTML element
  - ibook.js manages the audio playback via JavaScript

```
<img class="ibooks-media-audio" data-ibooks-audio-src="audio/moof.m4a" />
```



### **Changing Audio Playback Behavior**

• Resetting audio head playback: data-ibooks-audio-reset-on-play <img class="ibooks-media-audio" data-ibooks-audio-reset-on-play="true" data-ibooks-audio-src="audio/moof.m4a" />

# Add Interactivity in Seconds

### Add Interactivity in Seconds

• Include it <script src="js/ibook.js" type="text/javascript" charset="utf-8"></script>

### Add Interactivity in Seconds

- Include it <script src="js/ibook.js" type="text/javascript" charset="utf-8"></script>
- Add your class <div class="ibooks-deferred-event"></div>

### Add Interactivity in Seconds

- Include it <script src="js/ibook.js" type="text/javascript" charset="utf-8"></script>
- Customize it <div class="ibooks-deferred-event" data-ibooks-deferred-event="5000"></div>

### iBook.js Summary

- Available on iTunes Connect
- Easily pair audio or visuals
  - DOM load
  - Deferred events
- Leverage touch for user initiated events
  - Toggleables, draggables, stampables
- Simple audio control



## Advanced JS Interactivity

### Customize iBook.js

```
iBooksBaseController.prototype.initConfigurables = function() {
    // CSS class name on active elements
    iBook.ACTIVE_CSS_CLASS = "active";

    // CSS class name appended to body on page load
    iBook.CSS_CLASS_ON_LOAD = "build-in";

    // Delay in milliseconds before deferred events fire
    iBook.DEFERRED_EVENT_DELAY = "1000";

    // CSS selector for page
    iBook.PAGE_CSS_SELECTOR = ".page";

    // CSS class for stamped elements
    iBook.STAMPED_ELEMENT_CSS_CLASS = "stamp";
};
```

### Preventing Default iBooks UI

- Touch interactions display the menu bar, or dialog boxes
- JavaScript binding that prevents default behavior

preventDefault()



### Preventing Default iBooks UI

- Touch interactions display the menu bar, or dialog boxes
- JavaScript binding that prevents default behavior
  - preventDefault()



### Preventing Default iBooks UI

- Touch interactions display the menu bar, or dialog boxes
- JavaScript binding that prevents default behavior

preventDefault()



### Advanced JavaScript Interactivity

- Hardware sensors
  - Accelerometer
  - Gyroscope
  - Magnetometer
- Location services
- Gestures

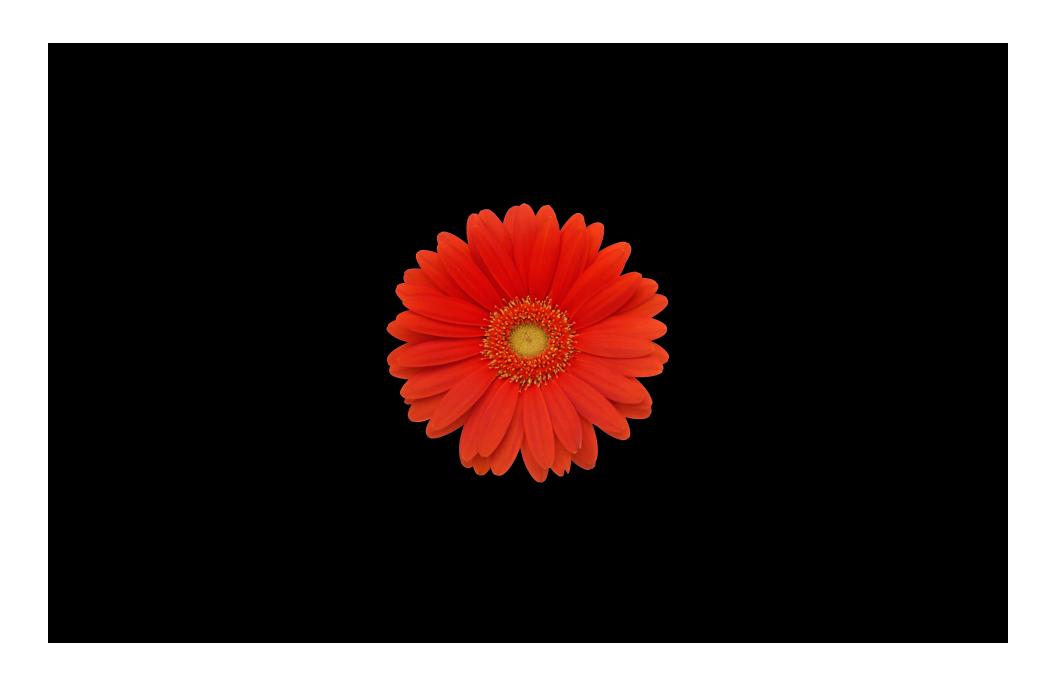


## Test, Test, Test

## Book Proofer EPUB Development Tool for iBooks

Alejandro Rodríguez iBooks







1. Edit and save document

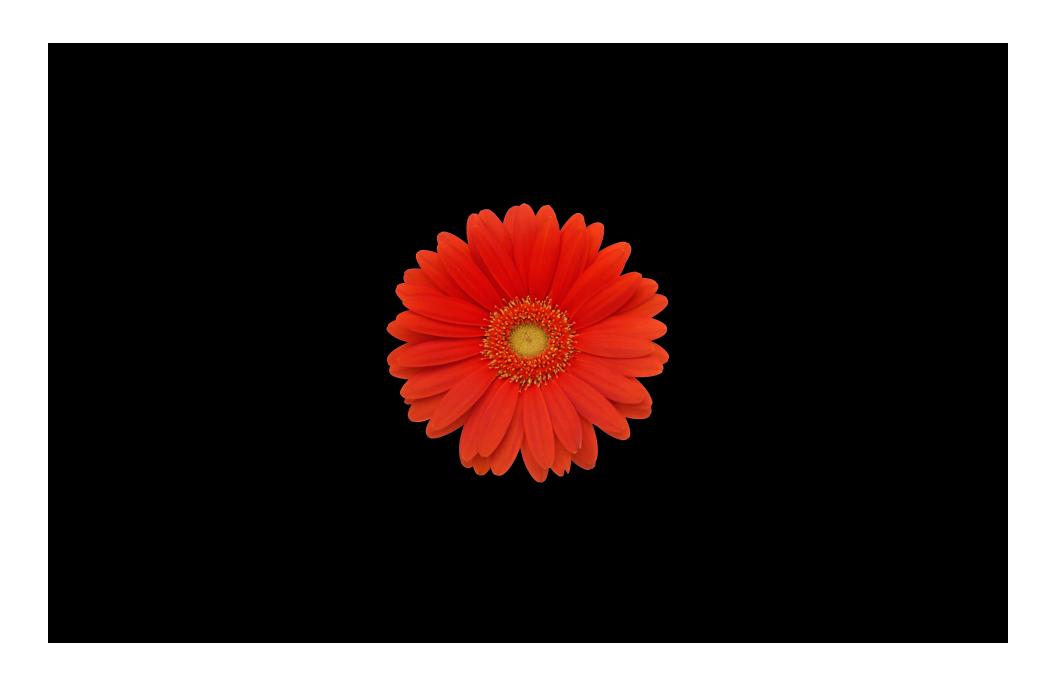
- 1. Edit and save document
- 2. Export as EPUB

- 1. Edit and save document
- 2. Export as EPUB
- 3. Sync to device

- 1. Edit and save document
- 2. Export as EPUB
- 3. Sync to device
- 4. Open in iBooks

- 1. Edit and save document
- 2. Export as EPUB
- 3. Sync to device
- 4. Open in iBooks
- 5. Turn chapter

- 1. Edit and save document
- 2. Export as EPUB
- 3. Sync to device
- 4. Open in iBooks
- 5. Turn chapter
- 6. Test









## Caching

1. Edit and save document

- 1. Edit and save document
- 2. Bump modification date

- 1. Edit and save document
- 2. Bump modification date
- 3. Export as EPUB

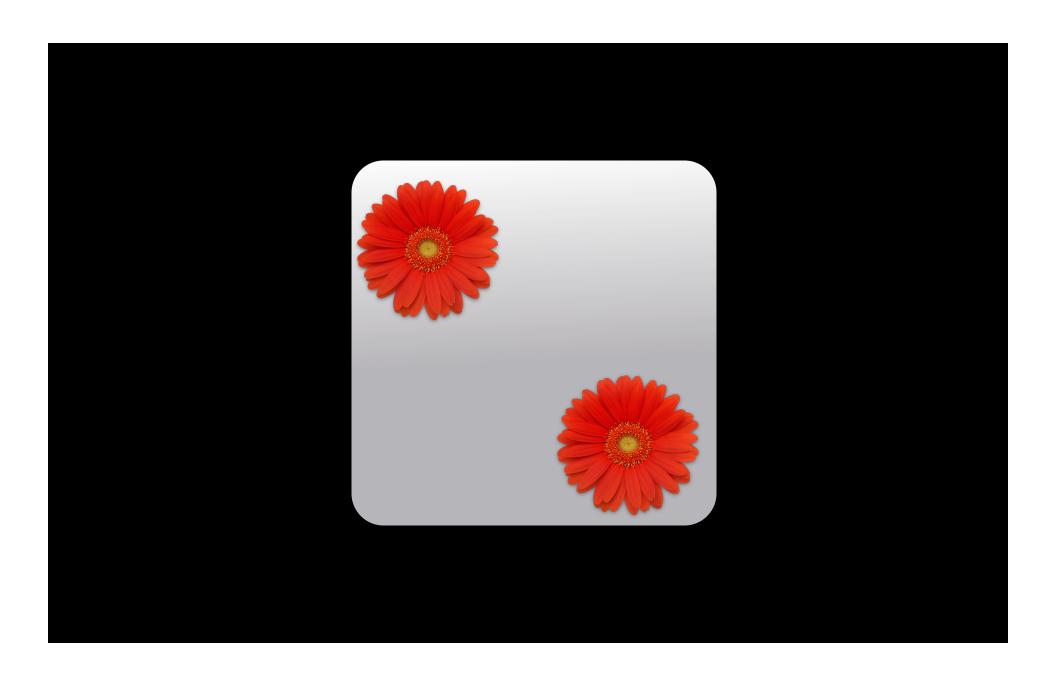
- 1. Edit and save document
- 2. Bump modification date
- 3. Export as EPUB
- 4. Sync to device

- 1. Edit and save document
- 2. Bump modification date
- 3. Export as EPUB
- 4. Sync to device
- 5. Open in iBooks

- 1. Edit and save document
- 2. Bump modification date
- 3. Export as EPUB
- 4. Sync to device
- 5. Open in iBooks
- 6. Turn chapter

- 1. Edit and save document
- 2. Bump modification date
- 3. Export as EPUB
- 4. Sync to device
- 5. Open in iBooks
- 6. Turn chapter
- 7. Test





1. Edit and save document

- 1. Edit and save document
- 2. Bump modification date
- 3. Export as EPUB
- 4. Sync to device
- 5. Open in iBooks
- 6. Turn chapter

- 1. Edit and save document
- 2. Bump modification date
- 3. Export as EPUB
- 4. Sync to device
- 5. Open in iBooks
- 6. Turn chapter
- 7. Test

- 1. Edit and save document
- 2. Test



**Book Proofer** 

# **Instant Feedback**



# **Automatic Sync**



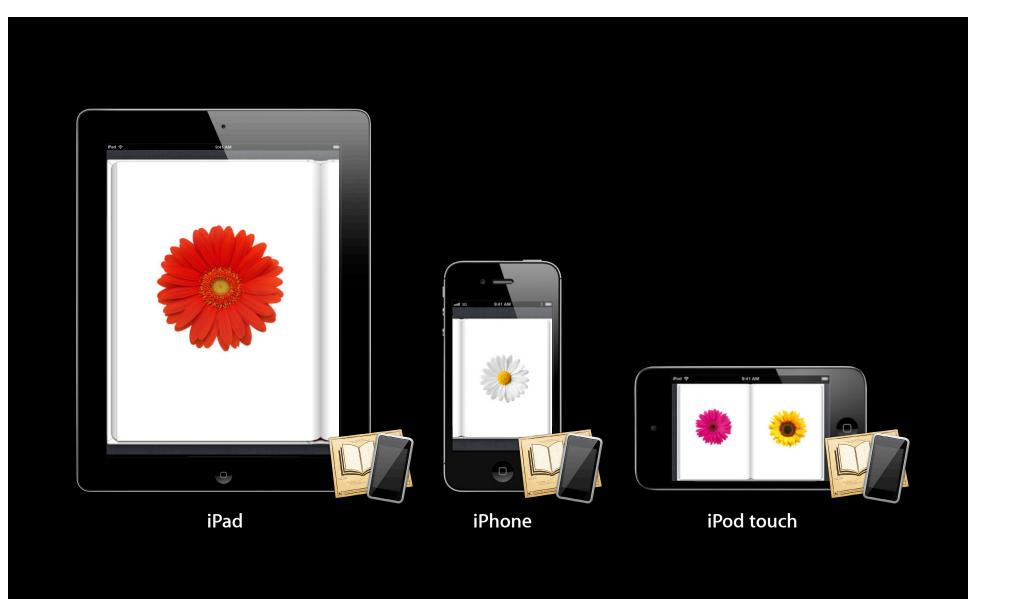
# **Tool Independence**













# Demo **Book Proofer workflow**

# iBooks: Summary

Casey Dougherty
iBookstore

### **EPUB** and iBooks



- Standard technologies
- Flowing and fixed layout
- Enhance
  - Interactivity
  - Audio and video
  - Read aloud
- Anyone can publish



### **More Information**

### Vicki Murley

Safari Technologies Evangelist vicki@apple.com

### **Apple Developer Forums**

http://devforums.apple.com/community/ibooks

### **iTunes Connect**

http://itunes.com/sellyourbooks

### International Digital Publishing Forum

EPUB Documentation http://idpf.org

### **Related Sessions**

Publishing with the iBookstore	Pacific Heights Tuesday 10:15AM
Building Books with iBooks Author	Mission Tuesday 11:30AM
HTML, CSS, and DOM for Book Authors	Nob Hill Wednesday 3:15PM
Improving Accessibility in Books	Russian Hill Thursday 9:00AM

### Labs

iBooks Open Lab

Safari and Web Lab Wednesday 10:15AM

# **WWDC**2012





