Introducing Search APIs
Increase app usage and discoverability
Session 709

Vipul Ved Prakash Siri
Dave Salim Siri
Jason Douglas Siri
Introducing Search APIs
Introducing Search APIs

Time Spent in Apps vs Web

- Apps: 86%
- Web: 14%

Flurry Insights
Introducing Search APIs

Developers choose what to index via Search APIs

Time Spent in Apps vs Web

- 86% Apps
- 14% Web

Flurry Insights
Introducing Search APIs

Developers choose what to index via Search APIs
App results appear in Spotlight and Safari
Introducing Search APIs

Developers choose what to index via Search APIs
App results appear in Spotlight and Safari
App results even appear when app not installed
AIRBNB

Warm & Welcome in Wine Country
Napa, CA
Confirmed: Jun 13th – 15th
2 nights, 2 guests

Inquiry - Warm & Welcome in Wine Country
Alexis Kay
Hello Vipul. The code for the gate is 3231. If you have any questions, just give me...

WIKIPEDIA

Napa County, California
Napa County is a county located north of San Pablo Bay in the U.S. state of California. As of the 2010 census, the population was 136,484. The county...
Reservation
HTF8DY

Alexis Kay
Accepted

Warm & Welcome in Wine Country

Entire 4 bedroom home in Napa Valley, CA

Arrives
Sat, Jun 13, 2015
3:00 PM

Departs
Mon, Jun 1, 2014
11:00 AM
Warm & Welcome in Wine Country
Napa, CA
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2 nights, 2 guests

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Napa County, California
Napa County is a county located north of Napa Valley in the U.S. state of California. As of the 2010 census, the county population was 136,484. The county...
Hey Vipul - this looks like a promising candidate for the search team. Take a look.

https://www.linkedin.com/profile/view?id=1234
Step count is the number of steps you take throughout the day. Pedometers and digital activity trackers can help you determine your

---

**Steps**

Daily Average: 9,785

1,998 steps

Today, 9:30 PM

30,000

**Show on Dashboard**

**Show All Data**

**Add Data Point**

**Share Data**

**Unit** steps
App and Content Discovery
App and Content Discovery

Deep links also in Apple’s cloud index
App and Content Discovery

Deep links also in Apple’s cloud index
Developers can tag content as public
App and Content Discovery

Deep links also in Apple’s cloud index
Developers can tag content as public
App and Content Discovery

Deep links also in Apple’s cloud index
Developers can tag content as public
Apple finds deep links from the web
App and Content Discovery

Deep links also in Apple’s cloud index
Developers can tag content as public
Apple finds deep links from the web
Seamlessly appear in iOS 9 Search
northern nights music festival
Fri, Jul 17, 2015 – Mon Jul 20, 2015
Cook’s Valley Campground
San Francisco, CA
eventbrite.com
Northern Nights Music Festival
by Northern Nights Music Festival

Friday, July 17, 2015 at 12:00 PM –
Monday, July 20, 2015 at 10:00 AM (PDT)
Cook's Valley Campground
83950 ROAD 442E
Piercy, CA 95587

<table>
<thead>
<tr>
<th>Ticket Type</th>
<th>Price</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Day GA Festival Ticket</td>
<td>$241.83</td>
<td>0</td>
</tr>
<tr>
<td>More Info</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Day VIP Festival Ticket</td>
<td>$330.45</td>
<td>0</td>
</tr>
<tr>
<td>More Info</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Day VIP Upgrade</td>
<td>$117.50</td>
<td>0</td>
</tr>
<tr>
<td>More Info</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reserved Grove Camping - 3</td>
<td>$173.25</td>
<td>0</td>
</tr>
<tr>
<td>Day Pass</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
App Search
Three APIs
App Search

Three APIs

NSUserActivity

Viewed App Content
App Search

Three APIs

- **NSUserActivity**: Viewed App Content
- **CoreSpotlight**: Any App Content
App Search
Three APIs

- **NSUserActivity**: Viewed App Content
- **CoreSpotlight**: Any App Content
- **Web Markup**: App Content on Web
1. NSUserActivity
2. CoreSpotlight
3. Web Markup
4. Achieving Best Results
5. User Guidelines
NSUserActivity & CoreSpotlight

Dave Salim
NSUserActivity
Indexes viewed app content

NSUserActivity
Viewed App Content

CoreSpotlight
Any App Content

Web Markup
App Content on Web
NSUserActivity
Indexes viewed app content

- Viewed App Content
- Any App Content
- App Content on Web
NSUserActivity
Background
NSUserActivity

Background

Introduced in iOS 8
Used in Handoff
Create activities in specific parts of your app
Handle continuing incoming activities in your app
NSUserActivity and App Search
NSUserActivity and App Search

Activities can be designated as searchable
Add indexable metadata
Results in iOS Search and Safari
Revisit activity on search selection
NSUserActivity
App search
NSUserActivity

App search

Baked Potato Chips

Ingredients
- 6

Nutrition
- 310 Calories

Directions
- 45 Minutes
NSUserActivity

App search
NSUserActivity

App search

Baked Potato Chips

Ingredients
6 Count

Nutrition
310 Calories

Directions
45 Minutes

Metadata
NSUserActivity

App search
NSUserActivity

App search

On-Device Index

Item 1
NSUserActivity

App search

On-Device Index

Item 1
NSUserActivity

App search

On-Device Index

Item 1  Item 2
NSUserActivity API
NSUserActivity API

Enable Capabilities

```swift
var eligibleForHandoff: Bool
var eligibleForSearch: Bool
var eligibleForPublicIndexing: Bool
```
NSUserActivity API

Enable Capabilities
var eligibleForHandoff: Bool
var eligibleForSearch: Bool
var eligibleForPublicIndexing: Bool

Provide Attributes and Keywords
var title: String?
var keywords: Set<String>
var contentAttributeSet: CSSearchableItemAttributeSet?
var expirationDate: NSDate
NSUserActivity API

Enable Capabilities

var `eligibleForHandoff`: Bool
var `eligibleForSearch`: Bool
var `eligibleForPublicIndexing`: Bool

Provide Attributes and Keywords

var `title`: String?
var `keywords`: Set<String>
var `contentAttributeSet`: CSSearchableItemAttributeSet?
var `expirationDate`: NSDate

Restoring on the Web

var `webpageURL`: NSURL?
Create Activity
Create Activity

```swift
var activity: NSUserActivity = NSUserActivity(activityType: "com.yummly.browseRecipe")
```
Create Activity

```swift
var activity: NSUserActivity = NSUserActivity(activityType: "com.yummly.browseRecipe")

activity.title = "Baked Potato Chips"
activity.userInfo = ["id": "http://www.yummly.com/recipe/BPC-983195"]
```
Create Activity

```swift
var activity: NSUserActivity = NSUserActivity(activityType:
    "com.yummly.browseRecipe")

activity.title = "Baked Potato Chips"
activity.userInfo = ["id": "http://www.yummly.com/recipe/BPC-983195"]

activity.eligibleForSearch = true
```
Create Activity

var activity: NSUserActivity = NSUserActivity(activityType: "com.yummly.browseRecipe")

activity.title = "Baked Potato Chips"
activity.userInfo = ["id": "http://www.yummly.com/recipe/BPC-983195"]

activity.eligibleForSearch = true

activity.becomeCurrent()
YUMMLY

Baked Potato Chips
From 12Tomatoes
45 min, 6 ingredients
210 Yums

Authentic Canadian Poutine Recipe
From Seasons and Suppers
60 min, 11 ingredients
114 Yums

Roasted Rosemary Dijon Potatoes
From Renee's Kitchen Adventures
35 mins, 6 ingredients
190 Yums

WIKIPEDIA

Potato
Baked Potato Chips
From 12Tomatoes
45 min, 6 ingredients
210 Yums

Authentic Canadian Poutine Recipe
From Seasons and Suppers
60 min, 11 ingredients
114 Yums

Roasted Rosemary Dijon Potatoes
From Renee's Kitchen Adventures
35 mins, 6 ingredients
190 Yums

Potato

activity.title
func applicationWillTerminate(_ application: UIApplication, continueUserActivity userActivity: NSUserActivity, restorationHandler: [AnyObject]? -> Void) -> Bool {
    return true
}

func application(UIApplication, continueUserActivity userActivity: NSUserActivity, restorationHandler: [AnyObject]? -> Void) -> Bool {

    return true

}
func application(UIApplication, continueUserActivity userActivity: NSUserActivity, restorationHandler: [AnyObject]? -> Void) -> Bool {
    if userActivity.activityType == "com.yummly.browseRecipe" {
        // Restore state for userActivity and userInfo
    }
    return true
}
Baked Potato Chips
From 12Tomatoes
45 min, 6 ingredients
210 Yums

Authentic Canadian Poutine Recipe
From Seasons and Suppers
60 min, 11 ingredients
114 Yums

Roasted Rosemary Dijon Potatoes
From Renee’s Kitchen Adventures
35 mins, 6 ingredients
190 Yums

Potato
NSUserActivity and Public Indexing
NSUserActivity and Public Indexing

Activities can be designated as public
Multiple users engage with device results
Popular public results available to other users
Results in Search and Safari (if URL included)
NSUserActivity and Public Indexing
NSUserActivity and Public Indexing
NSUserActivity and Public Indexing

User 1
Public Activity

Cloud Index
Public Activity
NSUserActivity and Public Indexing
NSUserActivity and Public Indexing

Cloud Index

User 1

User 2

User 3
Designating Activities Public

```swift
var activity: NSUserActivity = NSUserActivity(activityType: "com.yummly.browseRecipe")

activity.title = "Baked Potato Chips"

activity.userInfo = ["id": "http://www.yummly.com/recipe/BPC-983195"]

activity.eligibleForSearch = true

activity.becomeCurrent()
```
Designating Activities Public

```swift
var activity:NSUserActivity = NSUserActivity(activityType: "com.yummly.browseRecipe")
activity.title = "Baked Potato Chips"
activity.userInfo = ["id": "http://www.yummly.com/recipe/BPC-983195"]
activity.eligibleForSearch = true
activity.eligibleForPublicIndexing = true
activity.becomeCurrent()
```
NSUserActivity and Public Indexing

Privacy
NSUserActivity and Public Indexing

Privacy

Activities are private by default

Designate “public” if searchable activity fields are solely public

Provisions to prevent user-specific activities from being indexed
NSUserActivity and Public Indexing

Privacy

Activities are private by default

Designate “public” if searchable activity fields are solely public

Provisions to prevent user-specific activities from being indexed

```
Device 1

Hash

Cloud Index

threshold exceed? false
```
NSUserActivity and Public Indexing

Privacy

Activities are private by default
Designate “public” if searchable activity fields are solely public
Provisions to prevent user-specific activities from being indexed
Additional Benefits
Additional Benefits
Additional Benefits

Handoff
Additional Benefits
Handoff
Additional Benefits

Handoff
Additional Benefits

Handoff
Additional Benefits

Handoff
Additional Benefits
Handoff
Additional Benefits

Siri suggestions and smart reminders
1:1 with David
David's Office
Thursday, Apr 16, 2015 from 6PM to 7PM

Maslow's Human Needs
TED Radio Hour – NPR
Yesterday • 51 min
iPad Air 2
Change is in the Air.

Everything changes with iPad.
Explore ›
"Remind me about this"

OK, I'll remind you

Reminder

- Apple

Remove
CoreSpotlight
Indexes any app content

NSUserActivity
Viewed App Content

CoreSpotlight
Any App Content

Web Markup
App Content on Web
CoreSpotlight
Indexes any app content

NSUserActivity
Viewed App Content

CoreSpotlight
Any App Content

Web Markup
App Content on Web
CoreSpotlight
Overview
CoreSpotlight

Overview

New Framework in iOS 9
For any app content
Methods to add, update, and delete items
Used by Messages, Mail, Calendar, and Notes
CoreSpotlight API
CoreSpotlight API

CSSearchableItem
CoreSpotlight API

CSSearchableItem

CSSearchableItemAttributeSet (Metadata)
CoreSpotlight API

CSSearchableItem

CSSearchableItemAttributeSet (Metadata)

CSSearchableIndex

Item 1

Item 2

Item 3

Item 4

Item 5

Item 6
Create Item
Create Item

// Create attributeSet and populate with metadata
let attributeSet = CSSearchableItemAttributeSet(itemContentType: kUTTypeImage as String)
Create Item

// Create attributeSet and populate with metadata
let attributeSet = CSSearchableItemAttributeSet(itemContentType: kUTTypeImage as String)

attributeSet.title = "Haleakala Sunrise"
attributeSet.contentDescription = “May 12, 2015 Maui, Hawaii”
Create Item

// Create attributeSet and populate with metadata
let attributeSet = CSSearchableItemAttributeSet(itemContentType: kUTTypeImage as String)

attributeSet.title = "Haleakala Sunrise"
attributeSet.contentDescription = “May 12, 2015 Maui, Hawaii”

// Create item with unique identifier; domainIdentifier used to group items
let item = CSSearchableItem(uniqueIdentifier: "1", domainIdentifier: "album-1", attributeSet: attributeSet)
Create Item

// Create attributeSet and populate with metadata
let attributeSet = CSSearchableItemAttributeSet(itemContentType: kUTTypeImage as String)

attributeSet.title = "Haleakala Sunrise"
attributeSet.contentDescription = "May 12, 2015 Maui, Hawaii"

// Create item with unique identifier; domainIdentifier used to group items
let item = CSSearchableItem(uniqueIdentifier: "1", domainIdentifier: "album-1", attributeSet: attributeSet)

// Index item
CSSearchableIndex.defaultSearchableIndex().indexSearchableItems([item]) { error in
    if error != nil {
        print(error?.localizedDescription)
    } else {
        print("Item indexed!")
    }
}
Haleakala Sunrise
Maui, HI
f/2.2 • ISO 500 • 750x1334
Feb 22, 2015

Search Web
Search App Store
Search Maps
Restore
Overview
Restore
Overview

Implement UIApplication delegate

Same delegate method used for continuing NSUserActivity
Restore
Overview
// Application delegate called when CoreSpotlight result is tapped
func application(_ UIApplication, continueUserActivity userActivity: NSUserActivity,
restorationHandler: [AnyObject]? -> Void) -> Bool {

    return true

}
// Application delegate called when CoreSpotlight result is tapped
func application(_ UIApplication, continueUserActivity userActivity: NSUserActivity,
restorationHandler: [AnyObject]? -> Void) -> Bool {

    if userActivity.activityType == CSSearchableItemActionType {

    }

    return true

}
// Application delegate called when CoreSpotlight result is tapped
func application(UIApplication, continueUserActivity userActivity: NSUserActivity, restorationHandler: [AnyObject]? -> Void) -> Bool {

    if userActivity.activityType == CSSearchableItemActionType {
        let uniqueIdentifier = userActivity.userInfo?[CSSearchableItemActivityIdentifier] as? String
        // Use 'uniqueIdentifier'
    }

    return true
}
Same method as adding item to index

```swift
func indexSearchableItems(items: [CSSearchableItem], completionHandler: ((NSError?) -> Void)?)
```
Same method as adding item to index

```swift
func indexSearchableItems(items: [CSSearchableItem], completionHandler: ((NSError?) -> Void)?)
```
Same method as adding item to index

```swift
func indexSearchableItems(items: [CSSearchableItem], completionHandler: ((NSError?) -> Void)?)
```
Same method as adding item to index

```swift
func indexSearchableItems(items: [CSSearchableItem], completionHandler: ((NSError?) -> Void)?)
```
func deleteSearchableItemsWithIdentifiers(identifiers: [String], completionHandler: ((NSError?) -> Void)?)
func deleteSearchableItemsWithIdentifiers(identifiers: [String], completionHandler: ((NSError?) -> Void)?)

identifiers = ["1", "4", "5"]
func deleteSearchableItemsWithIdentifiers(identifiers: [String], completionHandler: ((NSError?) -> Void)?)

identifiers = ["1", "4", "5"]
func deleteSearchableItemsWithDomainIdentifiers(domainIdentifiers: [String], completionHandler: ((NSError?) -> Void)?)
func `deleteSearchableItemsWithDomainIdentifiers` (domainIdentifiers: [String], completionHandler: ((NSError?) -> Void)?)

domainIdentifiers = ["domain-2"]
func deleteSearchableItemsWithDomainIdentifiers(domainIdentifiers: [String], completionHandler: ((NSError?) -> Void)?)

domainIdentifiers = ["domain-2"]
func deleteAllSearchableItemsWithCompletionHandler(completionHandler: ((NSError?) -> Void)?)
func deleteAllSearchableItemsWithCompletionHandler(completionHandler: ((NSError?) -> Void)?)
Demo

Overview

Photo viewer
Index photos by title
Search
Restore
Additional Features

Overview

Batching
CSSearchableIndexDelegate
Extension
Data Protection classes
Web Markup

Jason Douglas
Web Markup
Indexes app content on web

- NSUserActivity: Viewed App Content
- CoreSpotlight: Any App Content
- Web Markup: App Content on Web
Web Markup
Indexes app content on web

Viewed App Content
NSUserActivity

Any App Content
CoreSpotlight

App Content on Web
Web Markup
Indexing Web Content

The content driving your app may live on the web, not locally inside the app. Deep linked pages from your app’s website are indexed for app search.
Indexing Web Content

Cloud Index

Device Index

Device Index

Device Index

Popular Public Items
Indexing Web Content

Cloud Index

Device Index

Device Index

Device Index

Popular Public Items

Applebot

App Website

App Website
Indexing Web Content
Indexing Web Content

Enabling app search
Indexing Web Content

Enabling app search

1. Allow Apple to discover and index your app’s website
Indexing Web Content

Enabling app search

1. Allow Apple to discover and index your app’s website
2. Ensure your app's website contains markup for mobile deep links
Indexing Web Content

Enabling app search

1. Allow Apple to discover and index your app’s website
2. Ensure your app's website contains markup for mobile deep links
3. Enable deep link handling for your app
Indexing Web Content

Enabling app search

1. Allow Apple to discover and index your app’s website
2. Ensure your app’s website contains markup for mobile deep links
3. Enable deep link handling for your app
4. Add markup for structured data (optional, but highly recommended)
Make travel planning as mobile as you are with the Airbnb iPhone App! Airbnb opens the door to the world's most interesting places to stay and is the simplest way to earn money from your extra space. With over 600,000 listings in more than 34,000 cities, Airbnb connects you with the experience that's right for you.

Message hosts and guests, gush over your itinerary, explore fairytale destinations, and add unforgettable digs to your Wish List. Make that penthouse, yurt, or treehouse your next home...or open up your own space to travelers.
Make travel planning as mobile as you are with the Airbnb iPhone App! Airbnb opens the door to the world's most interesting places to stay and is the simplest way to earn money from your extra space. With over 600,000 listings in more than 34,000 cities, Airbnb connects you with the experience that's right for you.

Message hosts and guests, gush over your itinerary, explore fairytale destinations, and add unforgettable digs to your Wish List. Make that penthouse, yurt, or treehouse your next home...or open up your own space to travelers.

Support URL: [http://airbnb.com/help](http://airbnb.com/help)

Marketing URL: [http://airbnb.com/mobile](http://airbnb.com/mobile)
Preparing Your Website

Smart App Banners

Smart App Banner provides a clear link into your app.
If the app is not installed, Safari prompts the user.

<meta name="myApp" content="app-id=123, app-argument=http://example.com/about">

See Promoting Apps with Smart App Banners on the Safari Web Content Guide.
Preparing Your Website

Smart App Banners

Smart App Banner provides a clear link into your app. If the app is not installed, Safari prompts the user.

<meta name="myApp" content="app-id=123, app-argument=http://example.com/about">

See Promoting Apps with Smart App Banners on the Safari Web Content Guide.
Preparing Your Website

Universal links

Universal links have several advantages over custom URL schemes.

Seamless Linking to Your App

Nob Hill

Thursday 3:30PM
Preparing Your Website

Universal links

Universal links have several advantages over custom URL schemes

• Unique
Preparing Your Website

Universal links

Universal links have several advantages over custom URL schemes

• Unique
• Secure
Preparing Your Website

Universal links

Universal links have several advantages over custom URL schemes

• Unique
• Secure
• Flexible

Seamless Linking to Your App
Preparing Your Website

Universal links have several advantages over custom URL schemes

- Unique
- Secure
- Flexible
- Work seamlessly across app and website
Preparing Your Website

Universal links

Deep links still need to be exposed via website’s markup
Use either Smart App Banners or an alternative supported standard

Seamless Linking to Your App

Nob Hill
Thursday 3:30PM
Preparing Your Website
Other deep link schemes
Preparing Your Website

Other deep link schemes

Other standards are supported as well, such as Twitter Cards:

```html
<meta name="twitter:app:name:iphone" content="myAppName">
<meta name="twitter:app:id:iphone" content="myAppID">
<meta name="twitter:app:url:iphone" content="myURL">
```
Preparing Your Website

Other deep link schemes

Other standards are supported as well, such as Twitter Cards:

```html
<meta name="twitter:app:name:iphone" content="myAppName">
<meta name="twitter:app:id:iphone" content="myAppID">
<meta name="twitter:app:url:iphone" content="myURL">
```

And Facebook’s App Links:

```html
<meta property="al:ios:app_name" content="myAppName">
<meta property="al:ios:app_store_id" content="myAppID">
<meta property="al:ios:url" content="myURL">
```
func application(application: UIApplication, openURL url: NSURL, sourceApplication: String?, annotation: AnyObject) -> Bool {

    // In this example, the URL is http://example.com/profile/?123
    if url.path == "/profile" {
        // Pass the profile ID from the URL, to the view controller
        profileViewController.loadProfile(url.query);
    }

    return false
}

Preparing Your App

Support deep linking

```swift
func application(application: UIApplication, openURL url: NSURL, sourceApplication: String?, annotation: AnyObject) -> Bool {
    // In this example, the URL is http://example.com/profile/?123
    if url.path == "/profile" {
        // Pass the profile ID from the URL, to the view controller
        profileViewController.loadProfile(url.query);
    }
    return false
}
```
Preparing Your App

Support deep linking

```swift
func application(application: UIApplication, openURL url: NSURL, sourceApplication: String?, annotation: AnyObject) -> Bool {

    // In this example, the URL is http://example.com/profile/?123
    if let components = NSURLComponents(URL: url, resolvingAgainstBaseURL: true),
       let path = components.path, let query = components.query {

        // Example code
        return false
    }

    return false
}
```
func application(application: UIApplication, openURL url: NSURL, sourceApplication: String?, annotation: AnyObject) -> Bool {

    // In this example, the URL is http://example.com/profile/?123
    if let components = NSURLComponents(URL: url, resolvingAgainstBaseURL: true),
        let path = components.path, let query = components.query {
        if path == "/profile" {
            // Pass the profile ID from the URL, to the view controller
            return profileViewController.loadProfile(query)
        }
    }

    return false
}
Rich Results
Semantic markup calls out key information

Go beyond just a title and description
Results can contain images, structured data, and even actions
Rich results are more engaging to users and can improve your ranking
Rich Results

Semantic markup calls out key information

Open Graph:

```html
<meta property="og:image" content="http://example.com/hello.jpg">
<meta property="og:audio" content="http://example.com/music.m4a">
<meta property="og:video" content="http://example.com/cats.mp4">
```
Rich Results

Semantic markup calls out key information

```
schema.org Microdata:

<div itemprop="aggregateRating" itemscope itemtype="http://schema.org/AggregateRating">
  <span itemprop="ratingValue">4</span> stars -
  <span itemprop="reviewCount">250</span> reviews
</div>
```
Rich Results

Semantic markup calls out key information

schema.org JSON-LD:

```html
<script type="application/ld+json">
{
    "@context": "http://schema.org",
    "@type": "AggregateRating",
    "ratingValue": "4",
    "reviewCount": "250"
}
</script>
```
Rich Results

Semantic markup calls out key information
Rich Results

Semantic markup calls out key information

Airbnb

Napa Valley Dreamhouse in Napa

Entire home/apt. 3 bedroom, 2 bath
$650 per night
★★★★★ 29 reviews
Rich Results

Semantic markup calls out key information

<title>Napa Valley Dream House in Napa</title>
Rich Results

Semantic markup calls out key information

<title>Napa Valley Dream House in Napa</title>
<meta itemprop="priceCurrency" content="USD">
<meta itemprop="price" content="650">
Rich Results
Semantic markup calls out key information

<title>Napa Valley Dream House in Napa</title>
<meta itemprop="priceCurrency" content="USD">
<meta itemprop="price" content="650">
<span itemprop="reviewCount">29</span>
Rich Results

Semantic markup calls out key information

<title>Napa Valley Dream House in Napa</title>
<meta itemprop="priceCurrency" content="USD">
<meta itemprop="price" content="650">
<span itemprop="reviewCount">29</span>
<meta itemprop="ratingValue" content="5.0">
Rich Results
Semantic markup calls out key information

<title>Napa Valley Dream House in Napa</title>
<meta itemprop="priceCurrency" content="USD">
<meta itemprop="price" content="650">
<span itemprop="reviewCount">29</span>
<meta itemprop="ratingValue" content="5.0">
<meta property="og:image" content="http://..."
Rich Results

Supported schemas
Rich Results

Supported schemas

AggregateRating
Rich Results
Supported schemas

AggregateRating
Offers
Rich Results

Supported schemas

AggregateRating
Offers
PriceRange
Rich Results

Supported schemas

AggregateRating
Offers
PriceRange
InteractionCount
Rich Results

Supported schemas

- AggregateRating
- Offers
- PriceRange
- InteractionCount
- Organization
Rich Results

Supported schemas

AggregateRating
Offers
PriceRange
InteractionCount
Organization
Recipe
Rich Results

Supported schemas

AggregateRating
Offers
PriceRange
InteractionCount
Organization
Recipe
SearchAction
Rich Results

Supported schemas

AggregateRating
Offers
PriceRange
InteractionCount
Organization
Recipe
SearchAction
ImageObject
Rich Results

Actions

Certain structured data allows your results to be actionable
Rich Results

Actions

Certain structured data allows your results to be actionable

Current supported actions are:

• Dialing a phone number
Rich Results

Actions

Certain structured data allows your results to be actionable

Current supported actions are:

• Dialing a phone number
• Getting directions to an address
Rich Results

Actions

Certain structured data allows your results to be actionable

Current supported actions are:

• Dialing a phone number
• Getting directions to an address
• Playing audio or video
Rich Results

Actions

<div itemscope itemtype="http://schema.org/Organization">
  <span itemprop="telephone">(408) 123-4567</span>
</div>

ABC Company
We aim to provide great customer service. For product inquiries, technical...
Rich Results

Actions

<div itemscope itemtype="http://schema.org/Organization">
  <span itemprop="telephone">
    (408) 123-4567
  </span>
</div>

<div itemscope itemtype="http://schema.org/AudioObject">
  <meta itemprop="contentUrl" content="http://abc.com/x.m4a" />
</div>

ABC Company
We aim to provide great customer service. For product inquiries, technical...

The Next Great Song
Listen to The Next Great Song and discover new music you're sure to...
★★★★☆☆ 123 Reviews
Rich Results

Actions

<div itemprop="address" itemscope
itemtype="http://schema.org/ PostalAddress">
  <span itemprop="streetAddress">
    200 Innovation Way
  </span>
  <span itemprop="addressLocality">
    San Francisco
  </span>
  <span itemprop="addressRegion">
    CA
  </span>
  <span itemprop="postalCode">
    94108
  </span>
</div>
Rich Results

Testing tools

App search markup validator for deep link and structured data testing
Check our developer site for more information later this year:
Rich Results

Resources

App Search Developer Site

Twitter’s Cards Protocol
http://dev.twitter.com/cards/mobile

Facebook’s App Links
http://applinks.org

schema.org
http://schema.org

Open Graph
http://ogp.me
Achieving Best Results
Adopting Multiple APIs

- **NSUserActivity**: Viewed App Content
- **CoreSpotlight**: Any App Content
- **Web Markup**: App Content on Web
Relevance: Linking APIs

- **NSUserActivity**: Viewed App Content
- **CoreSpotlight**: Any App Content
- **Web Markup**: App Content on Web
Relevance: Linking APIs

Core Spotlight

NSUserActivity

Web Markup
Relevance: Linking APIs

- CoreSpotlight
- NSUserActivity
- Web Markup
Relevance: Linking APIs

- CoreSpotlight
- NSURLActivity
- Web Markup
Relevance: Linking APIs

CoreSpotlight

CSSearchableItem.UniqueIdentifier

NSUserActivity.contentAttributeSet.relatedUniqueIdentifier

NSUserActivity.webpageURL

URL

Web Markup

Web page URL

URL
Relevance: Linking APIs

NSUserActivity

CoreSpotlight
Relevance: Linking APIs

NSUserActivity
.contentAttributeSet
.relatedUniqueIdentifier

CoreSpotlight

CSSearchableItem
.UniqueIdentifier
Relevance

Understanding the basis of relevance
Relevance
Understanding the basis of relevance

Goal to provide most relevant results
Relevance

Understanding the basis of relevance

Goal to provide most relevant results

Result quality a function of user interaction
Relevance

Understanding the basis of relevance

Goal to provide most relevant results
Result quality a function of user interaction
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Understanding the basis of relevance

Goal to provide most relevant results
Result quality a function of user interaction

URL Popularity
Activities (NSUserActivity)
Engagements

Relevance Score
Relevance

Understanding the basis of relevance

Goal to provide most relevant results
Result quality a function of user interaction
Relevance

Understanding the basis of relevance

Goal to provide most relevant results
Result quality a function of user interaction

URL Popularity
Activities (NSUserActivity)
Engagements

Relevance Score
Optimizing Relevance

Best practices
Optimizing Relevance

Best practices

Create great apps and content

Adopt API provisions that contribute to relevance

• NSUserActivity

• NSUSerActivity public indexing where appropriate

• Schema markup for ratings and reviews

Follow User Interface Guidelines
Protecting Relevance

Ranking works in both directions
Protecting Relevance

Ranking works in both directions

Search will down-rank or suppress poor results
Malicious or poorly considered implementations penalized
Ratio of engagement-to-shown a key quality metric
User Experience Guidelines
Descriptive Results
Descriptive Results

Richer results have better satisfaction and engagement

• Thumbnail, well-structured description, ratings, and actions
• Relevant and appealing image
• Key information user is looking for
Descriptive Results

Richer results have better satisfaction and engagement
- Thumbnail, well-structured description, ratings, and actions
- Relevant and appealing image
- Key information user is looking for

Keywords associate your result with queries
- Typical items should have 3 to 5 keywords
- Category keywords, e.g., “ticket” or “recipe”
- Synonyms or abbreviations for item subject
UI Behavior on App Launch

Get users to content with minimal distraction
UI Behavior on App Launch
Get users to content with minimal distraction

Go straight to content, no interstitials or multi-step builds
Guidelines apply to both app and web links
Time from result to content is measured and used in ranking
UI Behavior on App Launch

Examples
UI Behavior on App Launch

Examples
What to Index
What to Index

Any content viewed, created, or curated by user
What to Index

Any content viewed, created, or curated by user
Navigation points and features
What to Index

Any content viewed, created, or curated by user
Navigation points and features
New messages, content, or items arriving on device
What to Index

Any content viewed, created, or curated by user

Navigation points and features

New messages, content, or items arriving on device

Consider proactively indexed items of potential interest
What to Index

Any content viewed, created, or curated by user
Navigation points and features
New messages, content, or items arriving on device
Consider proactively indexed items of potential interest
iOS Search is flexible, extensible, and open to creativity
Summary
Summary
Summary

Fast on-device and cloud search
Summary

Fast on-device and cloud search
Three easy-to-adopt APIs
Summary

Fast on-device and cloud search
Three easy-to-adopt APIs
Increase engagement
Summary

Fast on-device and cloud search
Three easy-to-adopt APIs
Increase engagement
Free organic marketing
More Information

Technical Support
Apple Developer Forums
http://developer.apple.com/forums

Documentation
Search APIs Documentation
http://developer.apple.com/ios/search

General Inquiries
Paul Marcos, Software Evangelist
pmarcos@apple.com
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<th>Location</th>
<th>Time</th>
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<td>Thursday 3:30PM</td>
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