

Google™



# Accessibility: Building Products Everyone Can Use

Brad Green & Erin Rosenthal  
May 10, 2011

Twitter hash tags: #io2011, #TechTalk

Feedback: [goo.gl/n9BBr](http://goo.gl/n9BBr)

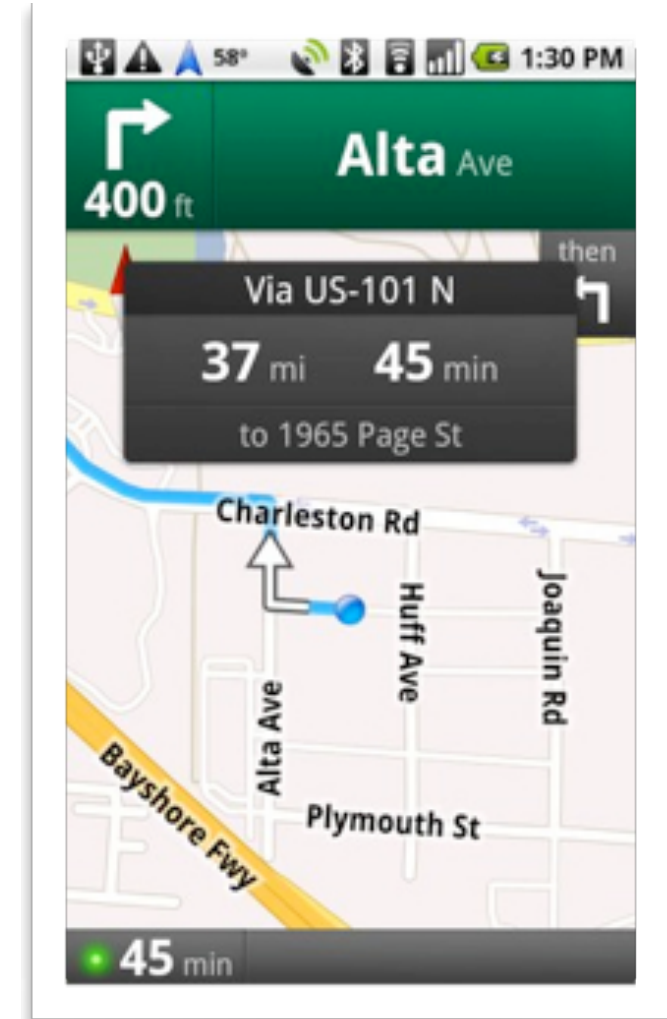
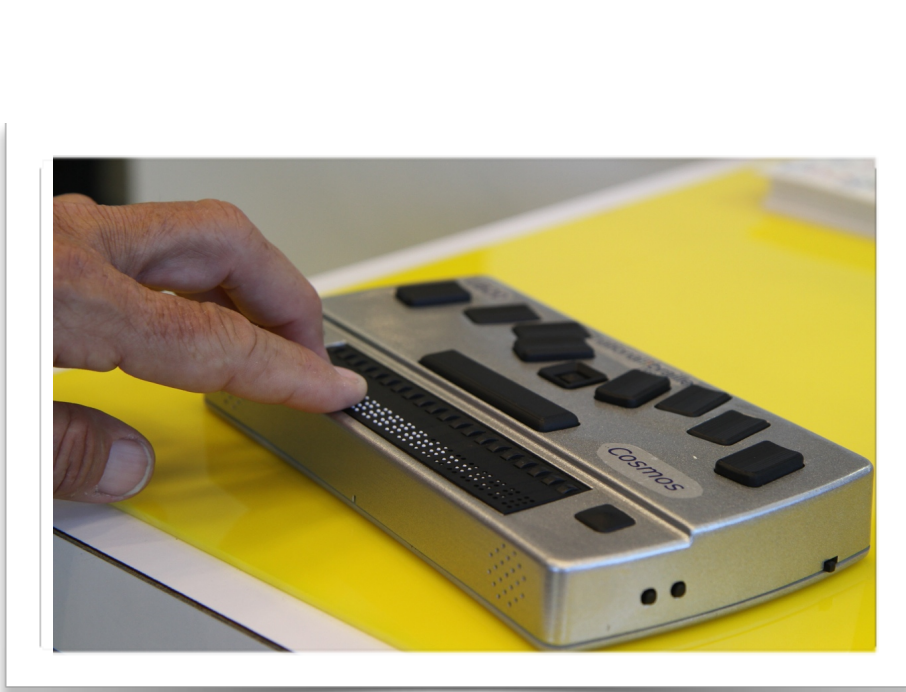
# How many of you...

- Accessibility awareness?
- Responsible for accessibility in your products?
- Know your gaps and how to make products accessible?

# What we'll talk about today

- Users of accessible products
- Overview of accessibility for the web and Android
- Introduce tools that will help you build and test your apps
- Cool demos!

# Why should I care?



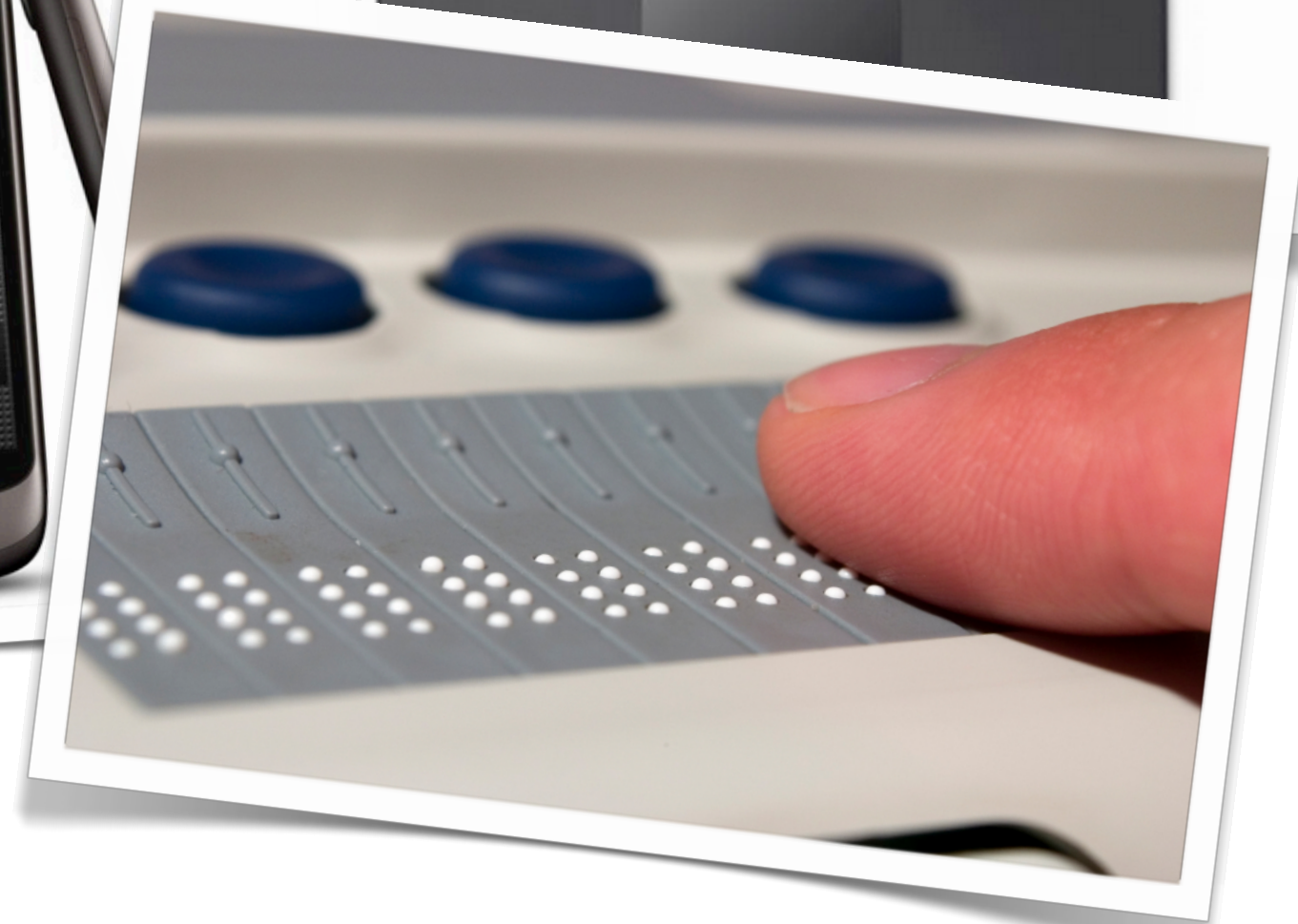
# Accessible technologies help everyone

- Keyboard access
- Text to speech
- Speech recognition
- Haptics
- Captioning
- Customizable UIs
- Testability



# Accessible Interfaces

- Understand your users and use cases
- Support multiple modes of interaction
  - Keyboard
  - Voice
  - Touch
  - Special purpose
- Provide good feedback
  - Speech
  - Audio
  - Vibration
  - Special purpose



# Keys to making your applications work

- Make sure all tasks can be completed through keyboard
- Manage the focus well within your application
- Add platform appropriate accessibility tags
- Add accessible support to custom controls
- Test it!!



# Creating empowering products

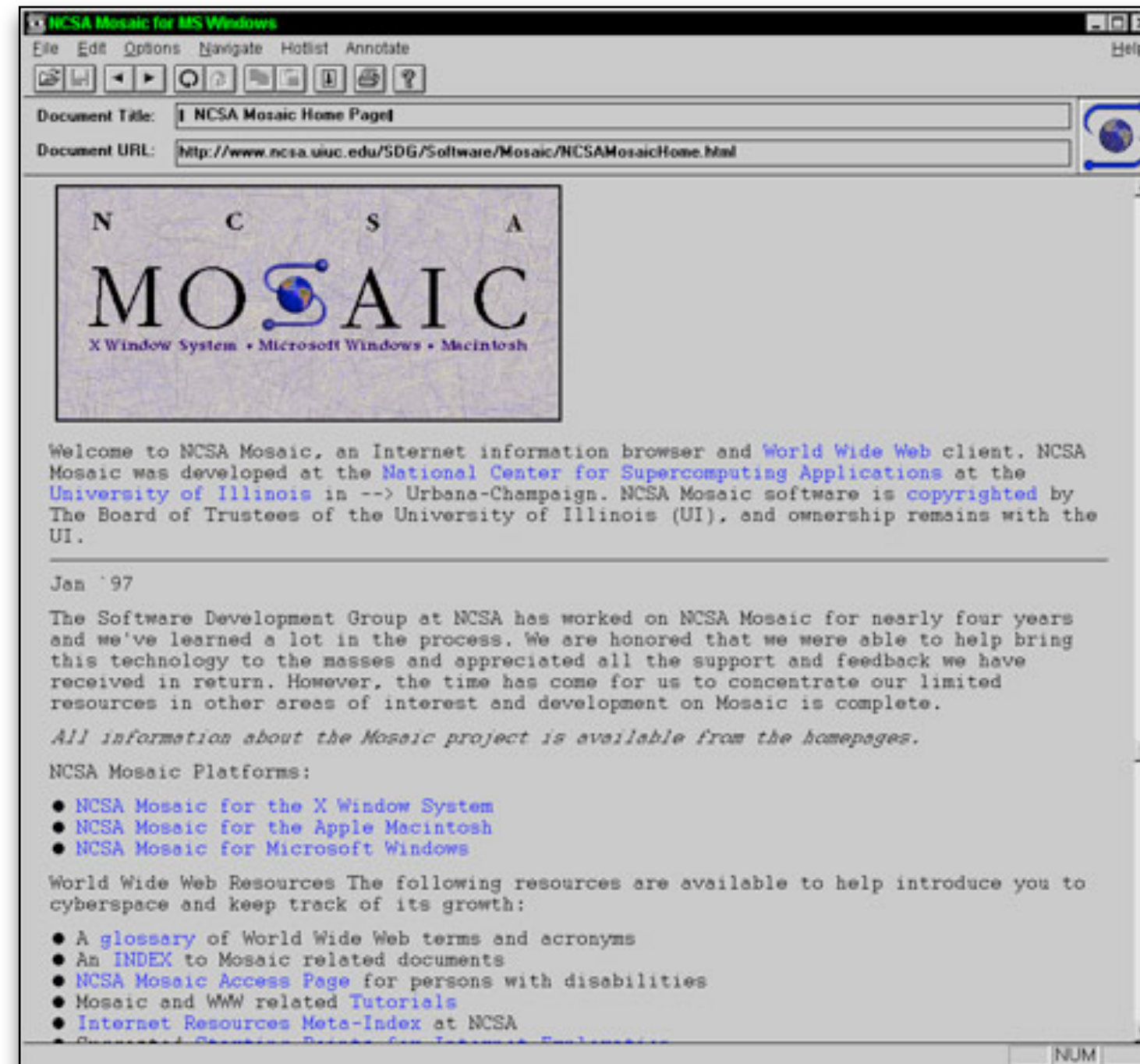
- Working out of the box
- Easy to set up
- No assistance needed
- Easy to learn
- Enabling independence



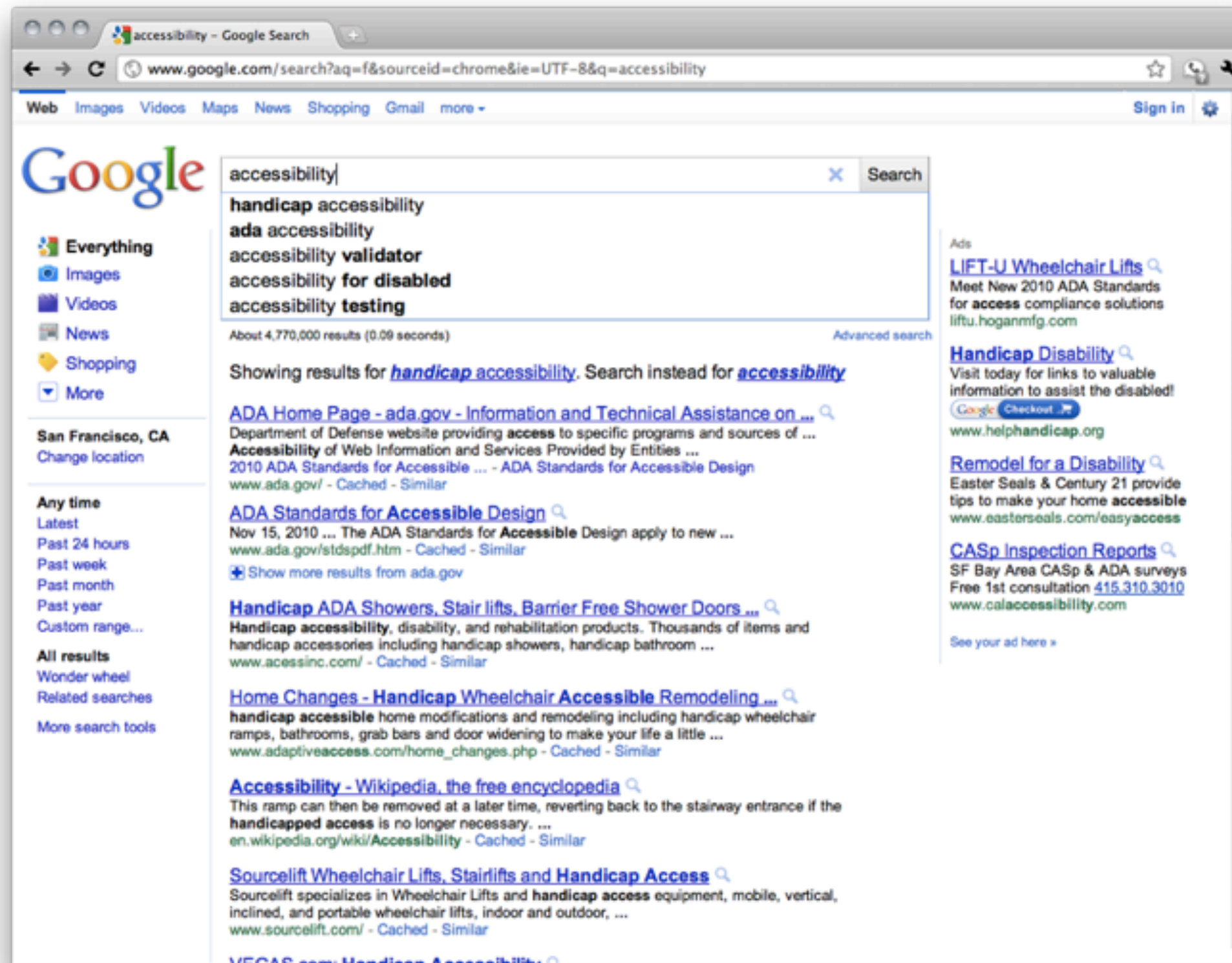


# Accessible Web Applications

# The Web started off simple



# Over time the web has evolved



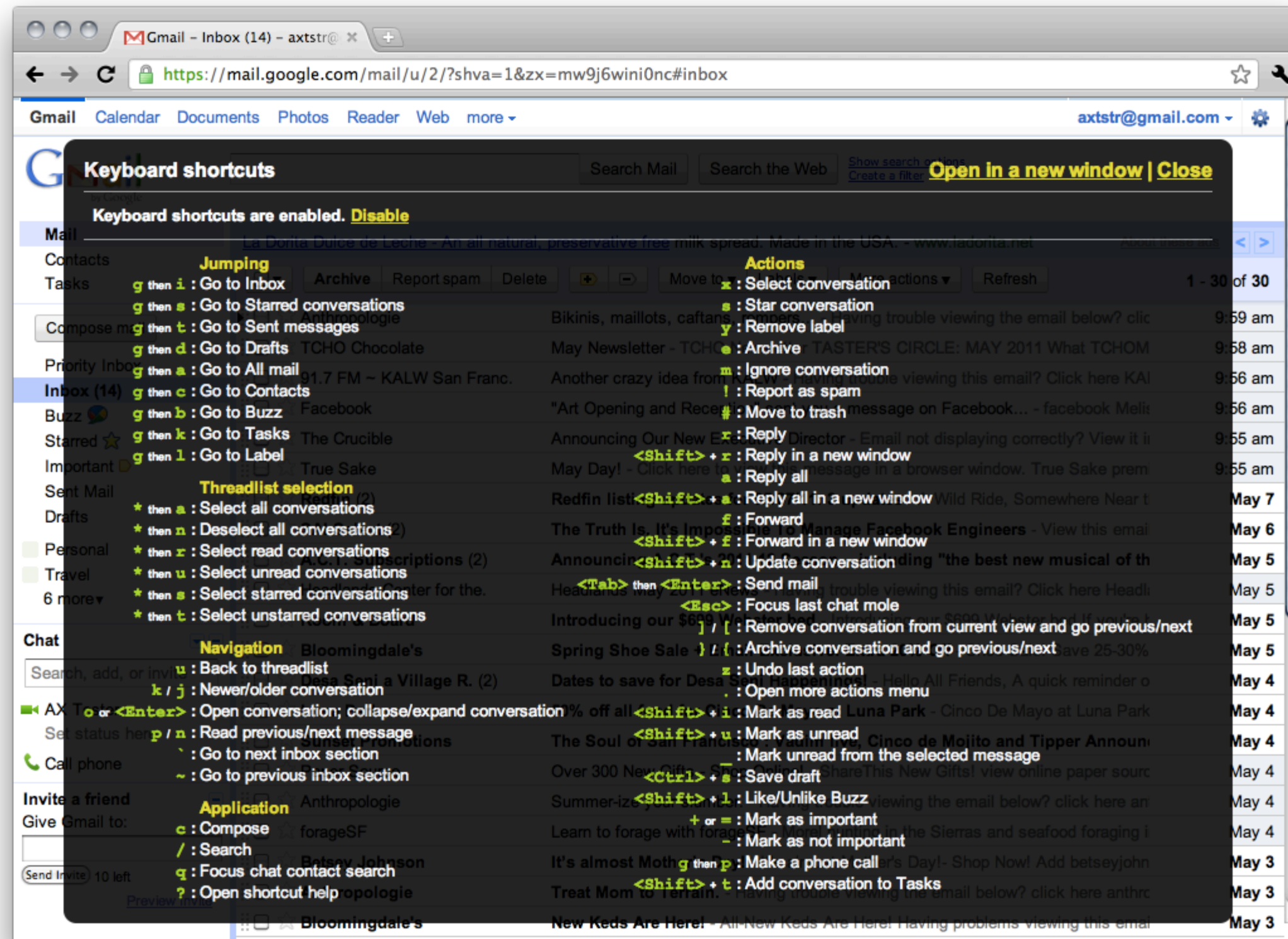


# And evolved...

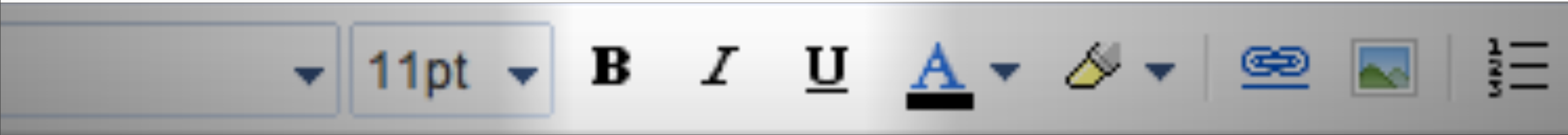
The screenshot shows the Gmail inbox interface. At the top, there's a navigation bar with links for Mail, Calendar, Documents, Photos, Reader, and Web. Below this is the Gmail logo and search bars for 'Search Mail' and 'Search the Web'. The main content area displays a list of 30 emails, with the top one being an advertisement for 'La Dorita Dulce de Leche'. The left sidebar contains navigation options like 'Compose mail', 'Priority Inbox', 'Inbox (14)', 'Buzz', 'Starred', 'Important', 'Sent Mail', 'Drafts', 'Personal', 'Travel', 'Chat', and 'Invite a friend'.

The screenshot shows the Google Calendar interface in a weekly view for May 8-14, 2011. The calendar grid displays various events such as 'Mother's Day', 'IO Keynote', 'Picnic with Mom', 'Team Dinner', and 'Mini Golf Championships'. The left sidebar includes a 'My calendars' section with 'axtstr' and 'Tasks' selected, and an 'Other calendars' section with 'Contacts' birthdays and 'US Holidays'. The right sidebar shows a 'Tasks' list with items like 'Finish Presentation', 'Sleep', and 'Practice!'. The bottom of the interface features a 'Smart Rescheduler' tip and navigation controls.

# Keyboard navigation



# ARIA: New accessibility standards



```
<div role="toolbar" tabindex="0"  
  aria-activedescendant="btn1" id="tb1">  
    
    
    
</div>
```



# How is Google helping?

- *Chrome* integration with screen readers
- *ChromeVox*, a screen reader built into ChromeOS also available as an extension for developers
- *ChromeShades*, a tool for visualizing accessible navigation for your website

`code.google.com/p/google-axe-chrome/`

# What ChromeVox does

- Provides spoken feedback as you navigate
- Uses latest accessibility standards including ARIA
- Reacts to dynamic updates
- Speaks relevant information
- Plays 'earcon' audio indicators
- Unprecedented control through VoxScripts

# VoxScript

```
syncToNode(targetNode)
```

```
speak(text, queueMode, options)
```

```
playEarcon(earcon)
```

# Demo: ChromeVox on Chrome OS

Charles Chen  
*Software Engineer @ Google*

# ChromeVox on ChromeOS

- Recreate the desktop experience
- Unprecedented level of control
- Seamless user experience

# ChromeShades

Google Calendar interface showing a weekly view for May 8 - 14, 2011. The calendar displays various events such as 'Mother's Day', 'IO Keynote', 'Picnic with Mom', and 'Team Dinner'. The interface includes navigation links (Gmail, Calendar, Documents, Photos, Reader, Web) and a search bar. The right sidebar shows a 'Tasks' list with items like 'Finish Presentation', 'Sleep', and 'Practice!'.

Google Calendar interface showing a list of search results. The results include links to 'Gmail', 'Calendar', 'Documents', 'Photos', 'Reader', 'Web', and 'more'. Below the search results, there are input fields for 'Search', 'Show search options', and 'Quick add'. The date selector shows 'May 8 - 14, 2011'.



# Accessibility in Android



# Accessible mobile apps are everywhere

- Inherent accessibility
- Designed for being distracted
- Open, customizable platform

# Many eyes and ears

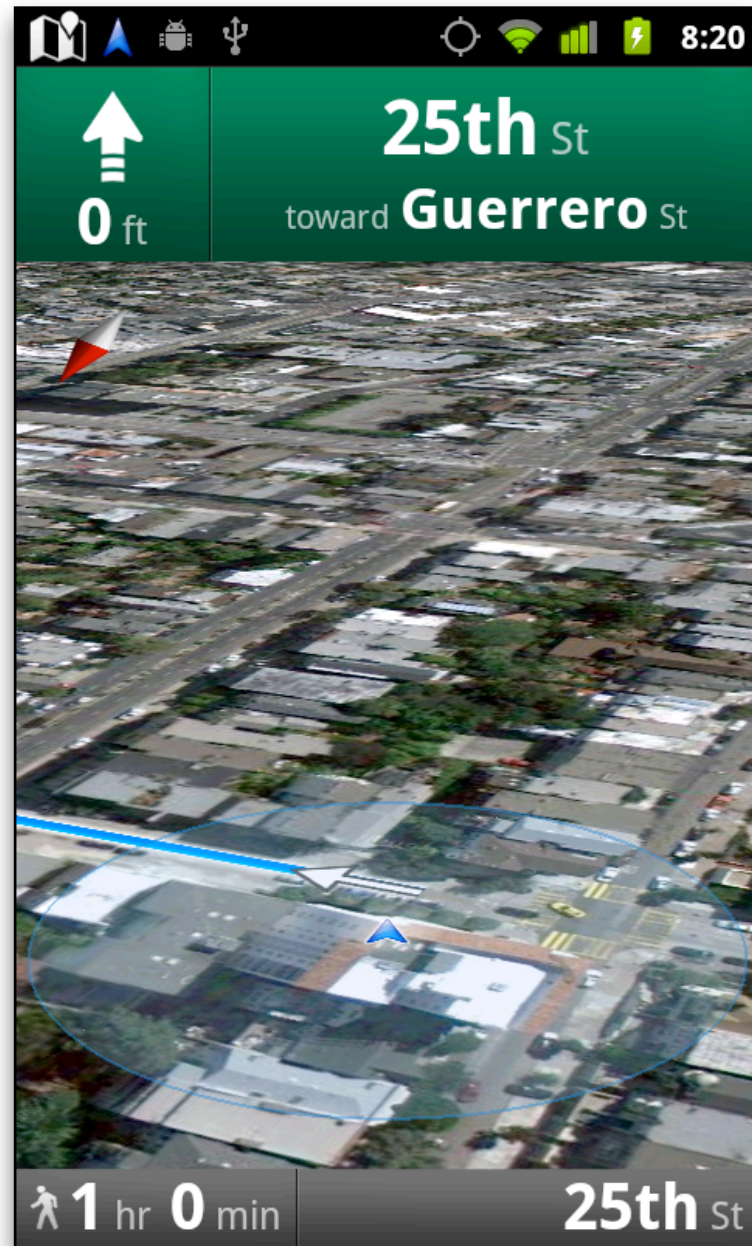
Phone  
Speaker  
Microphone  
Touch Screen



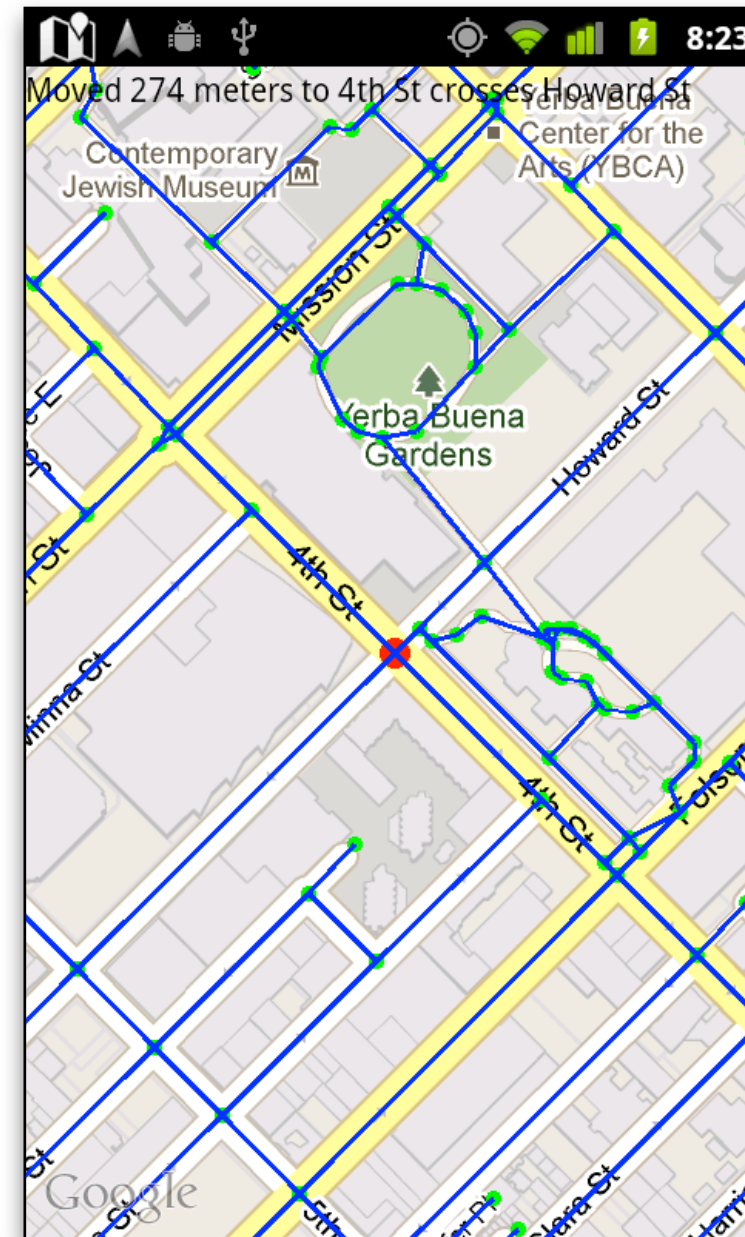
Internet  
Camera  
GPS  
Near field  
communication

Location aware. Context aware. Extremely powerful

# Take advantage of the technology



Walky Talky



Intersection Explorer

# Android Accessibility Support

- Accessible framework
- Accessible services
  - TalkBack
  - KickBack
  - SoundBack
- Open, highly customizable platform



# What makes an Android App Accessible?



- Use standard controls
- Label controls with `contentDescription`
- Make all controls reachable with D-pad and Trackball
- Include focused states
- Raise accessibility events

# Demo: Cool Reader & KhAndroid

Steve Jacobs

*President, IDEAL Group, Inc*

*CEO, Apps4Android, Inc*

# IDEAL Group

- CoolReader
  - Uses gestures to interact without needing to see the screen
  - Provides verbal feedback
- KhAndroid
  - Provides great access to great content for everyone
  - Based on Google Accessibility Developer Challenge



“Deaf people can do anything but hear.”

Dr. I. King Jordan  
*The first Deaf president of Gallaudet University*

# Enabling communities

- Quickly adopted by the deaf community
- Text chat & SMS
- Video phones
- Watching videos with captions

# Demo: Mobile ASL

Jaehong Chon

*Ph.D. Student at University of Washington*

# Mobile ASL Android App

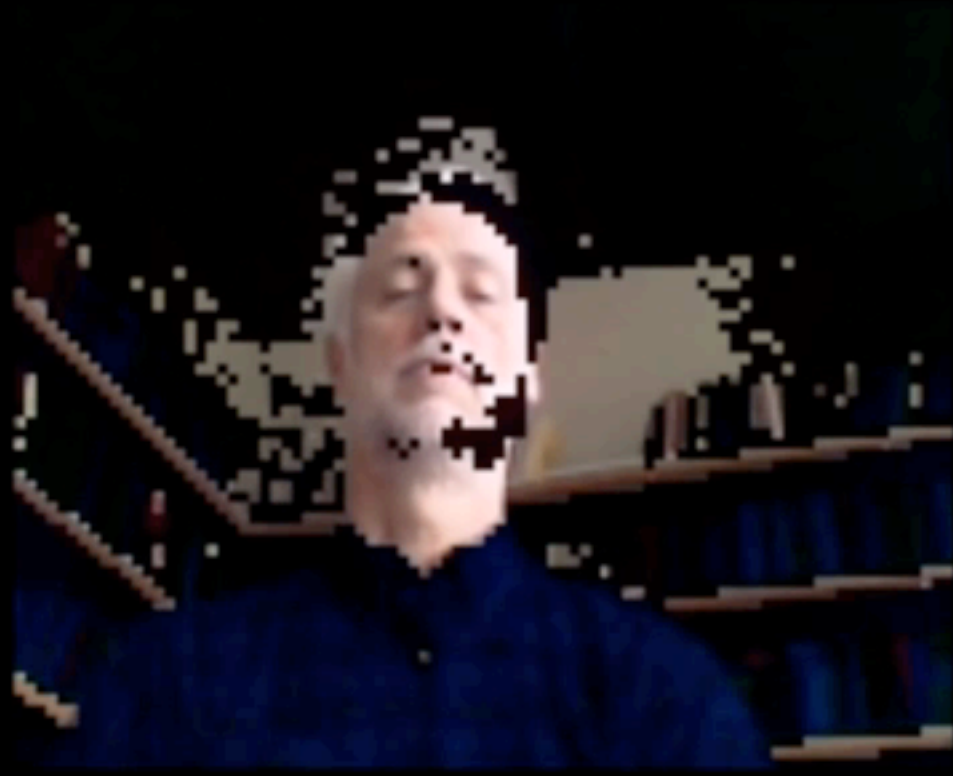


- Video chat for sign language
- Works on Cellular network and Wi-Fi
- Optimized for low bandwidth
  - Maintain quality of face and hands in image
  - Audio stream removed
  - Lower FPS for static content (when listening)

<http://mobileasl.cs.washington.edu>



**Original**



**Skin Pixel**



**Skin Block**

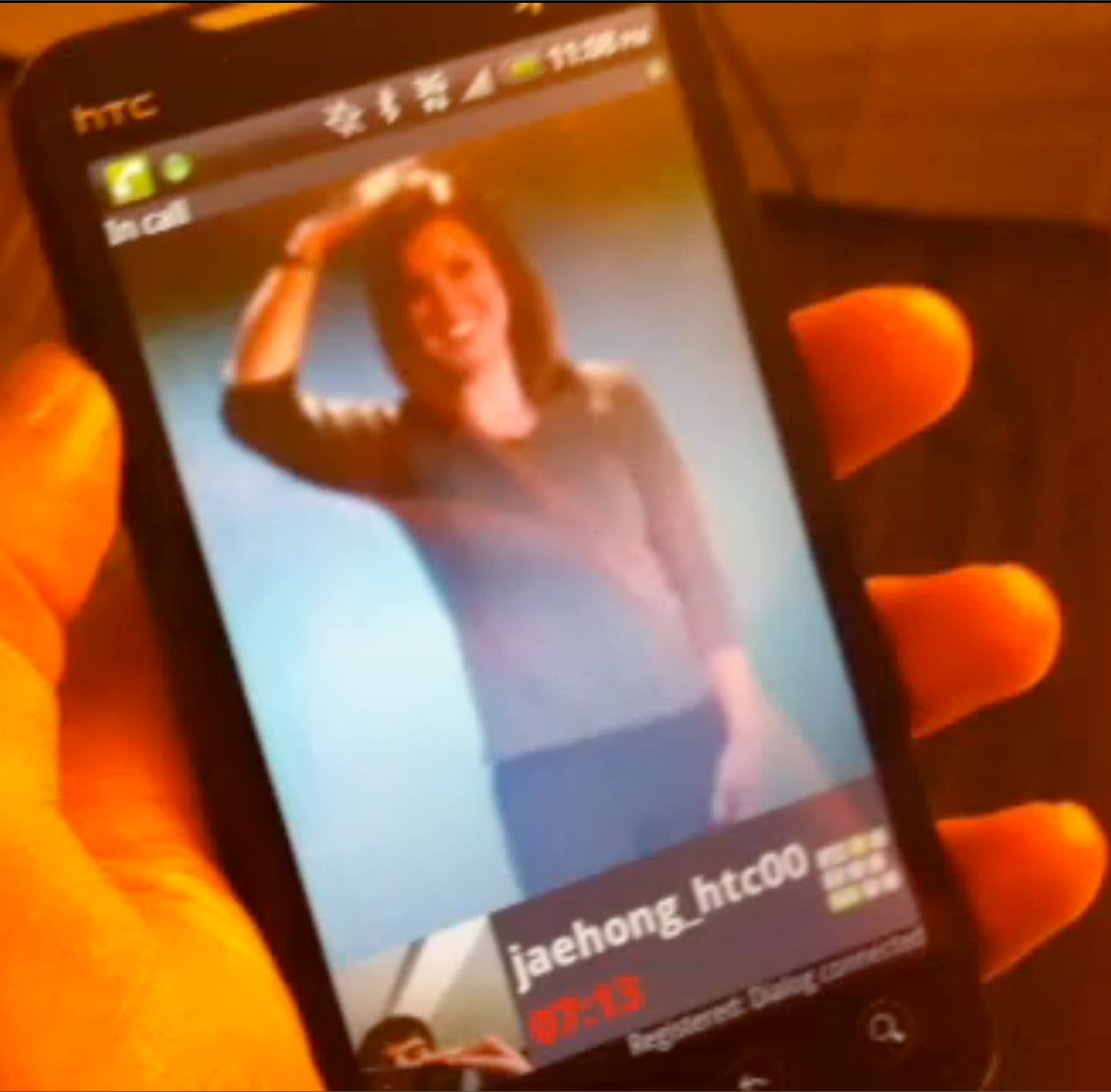


**30K**



**30K ROI**





htc

11:58 AM

In call

jaehong\_htc00

07:13

Registered: Dialog Connect

# Making your applications accessible

- Understand your users and use cases
- Enable independence
  - Multiple ways to interact
  - Good feedback
- End to end experience



# Making your applications accessible

- Use standard toolkits
- Make sure there are keyboard workflows for all tasks
- Be aware of tab order and focus
- Test it in a screen reader, like ChromeVox

# Learning more @ I/O

## Accessibility Sessions

*Today*

*10:15am – 11:15am (available on YouTube)*

**Leveraging Android Accessibility APIs to Create an Accessible Experience**

*Tomorrow*

*12:30pm – 1:30pm*

**The YouTube Caption API, Speech Recognition, and WebVTT captions for HTML5**

*3pm – 4pm*

**Creating Accessible Interactive Web Apps using HTML5**

## Developer Sandbox – 2nd Floor

All day

## Office Hours – 2nd Floor

Tuesday 3pm – 6:30pm

Wednesday 3pm – 5pm

## Contact us

Brad Green (bradgreen@google.com)

Erin Rosenthal (erosenthal@google.com)

Session Hash Tags: #io2011, #TechTalk

Feedback: [goo.gl/n9BBr](http://goo.gl/n9BBr)

## Other Links

[google.com/accessibility](http://google.com/accessibility)

[code.google.com/p/google-axs-chrome/](http://code.google.com/p/google-axs-chrome/)

[developer.android.com/guide/practices/design/accessibility.html](http://developer.android.com/guide/practices/design/accessibility.html)



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