

# Mobile Web



# Mobile Web Today

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- Lots of people think Mobile Web will be next big thing
- However, huge barriers:
  - Network speed
  - Poor input
  - Small screens
- How to make existing content work on such devices?



# Today's Outline

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- Alternative markup languages and protocols
- Methods for transforming existing web content
- Methods for managing small screens
- Physical hyperlinks

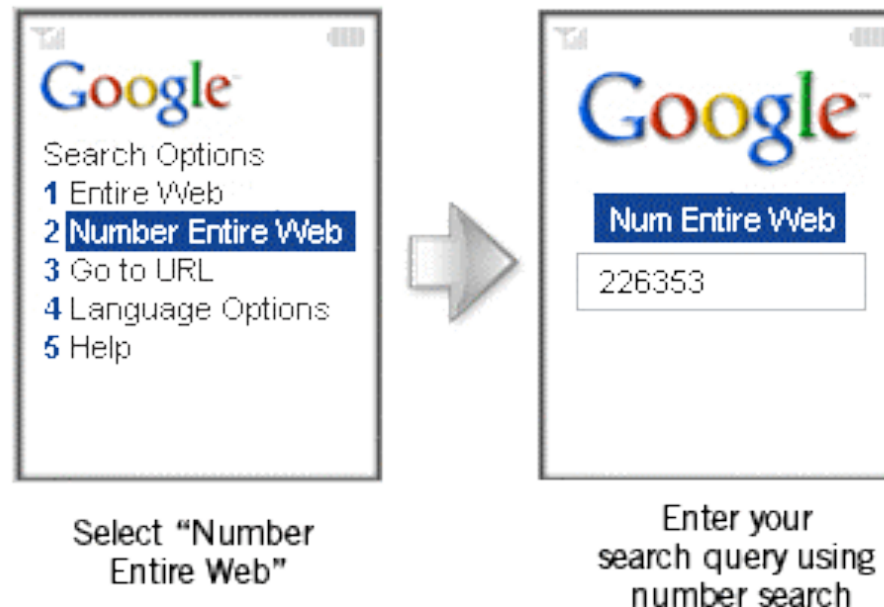
# Alternative Markup and Protocols

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- Basic idea: standard HTTP and HTML don't work well for mobile, so manually rewrite your content
- Two variants:
  - WAP / WML
  - Compact HTML (i-Mode)

# Alternative Markup and Protocols

- Wireless Application Protocol (WAP) and Wireless Markup Language (WML)
  - Analogous to HTTP and HTML
- Requires special browser
  - Available on many phones



# Alternative Markup and Protocols

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- Download “deck of cards”
  - Represents transaction
  - Faster than lots of back and forth
- Most major sites offer WAP pages
  - Google, Yahoo, EBay

# Alternative Markup and Protocols

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- Compact HTML (CHTML)
  - Developed by NTT DoCoMo, for use on i-mode phones
    - Do Communication Mobile, “Everywhere”
  - Subset of HTML, plus some features for keypad
- Taken off in Japan
  - ~50 million customers in Japan
  - 5000 official sites, ~100,000 unofficial
  - Trying to move overseas



# Alternative Markup and Protocols

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- WAP / WML and Compact HTML (i-Mode)
  - Rivals
  - Fairly popular
  - Have to rewrite your content to make it work though



# Today's Outline

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# Transforming Existing Content

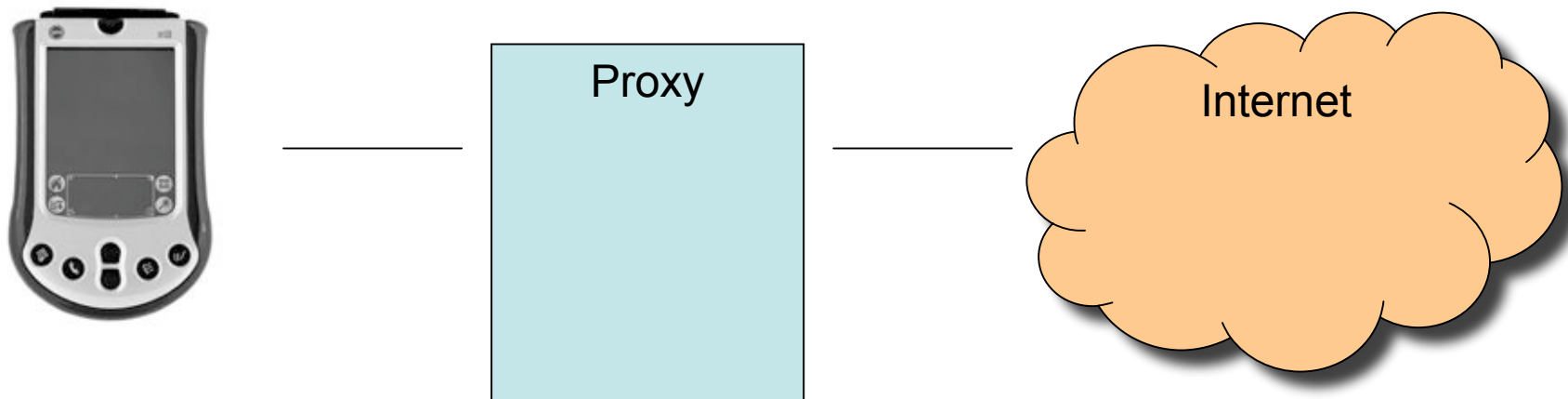
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- Basic idea: rather than manually re-writing all content, can we do it automatically
  - Ex. Server or proxy modifies content on the fly

# Transforming Existing Content

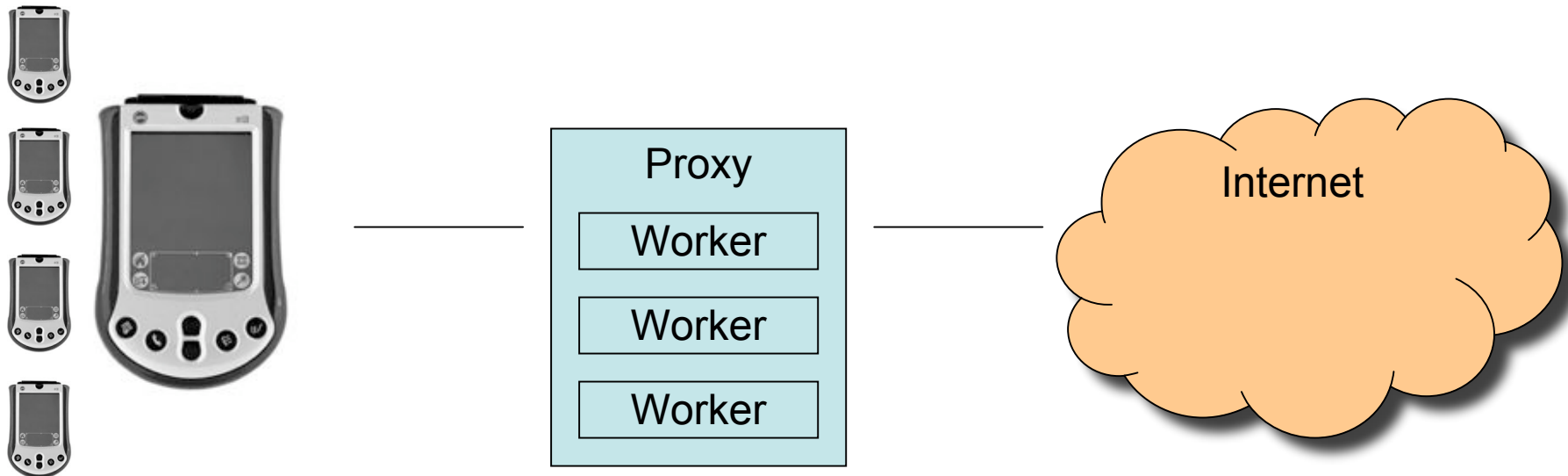
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- Top Gun Wingman
  - Make it so Palm Pilots with wireless could browse web
  - However, Palm Pilots had very little processing power
- Key idea: have a proxy manage everything
  - Proxy takes web page, hands pre-formatted text and images
  - Palm Pilot just prints to screen (very thin client)



# Transforming Existing Content

- Early example of cluster-based computing
  - Proxy could scale up to support thousands of people
  - Proxy could improve overall throughput (caching, distilling)
  - Proxy could improve compatibility (transforming)
- Smart network, dumb clients



# Proxies for Better User Experience

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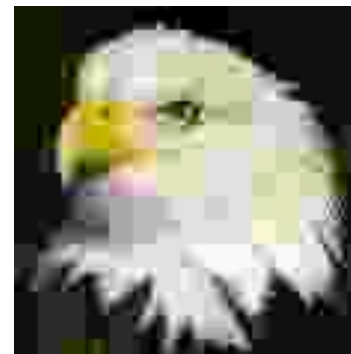
- Proxy could improve user experience
  - Improve download speeds (distilling)



**10.3 KB**



**2.0 KB**



**1.1 KB**

- Cache content
  - Large shared proxy more likely to have content you want
  - Thus faster download

# Proxies for Better Compatibility

- Proxy can improve compatibility
  - Customize web pages and images for a specific device
  - Ex. Palm Pilot could only do 2-bit grayscale



(a)



(b)



(c)

guides will be available to allow everyone to enjoy this unique setting.



Lake Windermere is England's longest lake, stretching 11.5 miles (18.4 km) from Waterhead near Ambleside to Lakeside at its narrow southern end. Wooded slopes dotted with villas line the shores while the water itself is

(a)

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(b)



(c)

# Other Benefits of Proxies

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- Other arguments for proxy-based architectures
  - More expensive proxies → cheaper devices
  - Harder to lose your data (you are your own worst enemy)
  - Amortize total cost of ownership better
- Back in dotcom days
  - ProxiNet → Puma → Intellisync

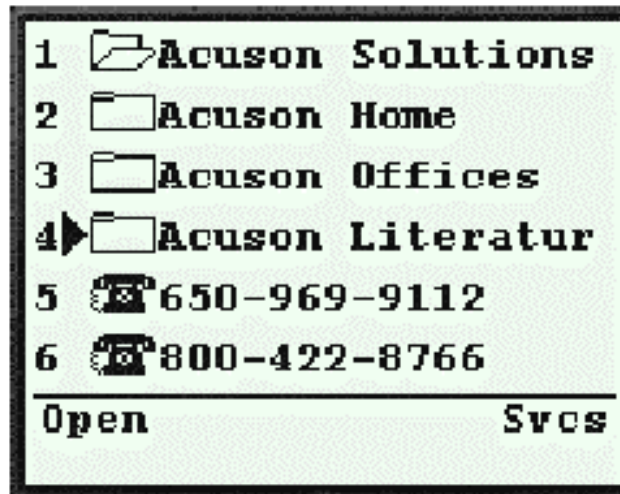


# Transforming Existing Content

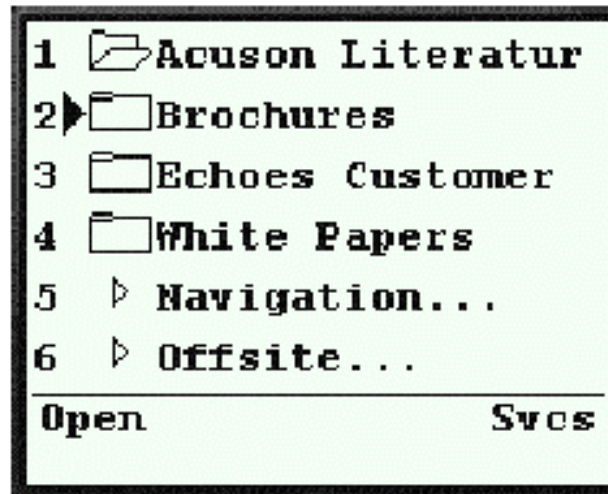
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- m-Links proxy for transforming web pages
- People don't use web on phones same as desktop
- Transform web pages to fit likely mobile needs
  - Not surfing
  - Better navigation
  - Printing, saving, emailing, faxing, translating

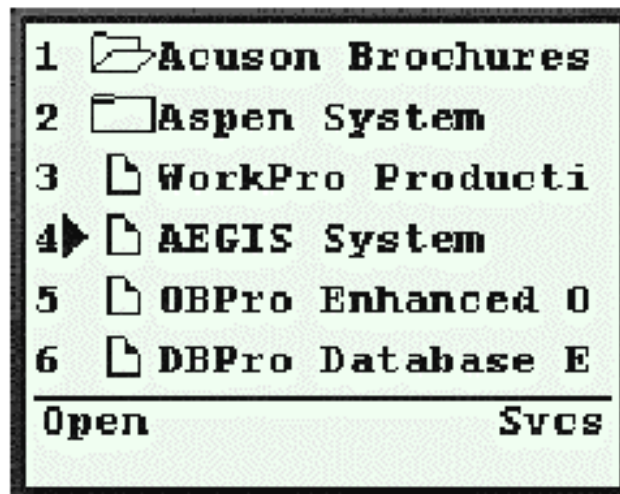
# m-Links example



(a)



(b)



(c)



(d)

# Features in m-Links

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- Data detector
  - Create links to phone nums and email addresses
- Better navigation
  - Fixes bad link names like “click here”
  - Automatic link categorization
- Better services
  - Adds useful services (e.g. email, view, fax)
  - All with a minimum of user input
- Other thoughts on m-Links paper?

# Why Not More Proxies?

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- Mobile devices rapidly improved
  - Got to a good enough state fairly quickly
  - CPU, storage, display, web browsers
  - Wireless networking still could be improved
- Wireless web hasn't taken off
  - Slow, expensive, not a strong need for proxies (yet?)
- Caches are everywhere (though hidden)
  - Vodafone, AOL cache
- Business model for proxies
  - Makes sense for wireless provider, but elsewhere?
  - Not clear how many people willing to pay for it

# Today's Outline

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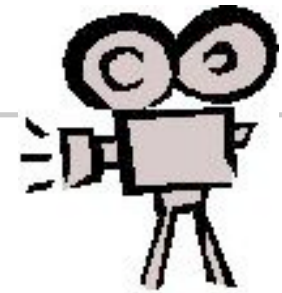
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# Managing Small Displays

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- Problem: small screen real estate makes it hard to see anything useful
- Two techniques:
  - Collapse to Zoom
  - Summary Thumbnails

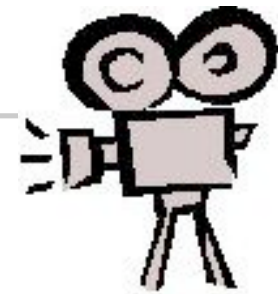
# Managing Small Displays



- Manually collapsing portions of the screen



# Managing Small Displays



- Automatically augmenting important details





# Today's Outline

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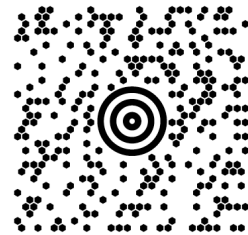
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# Physical Hyperlinks

- Lots of people have proposed ways of linking physical world to web



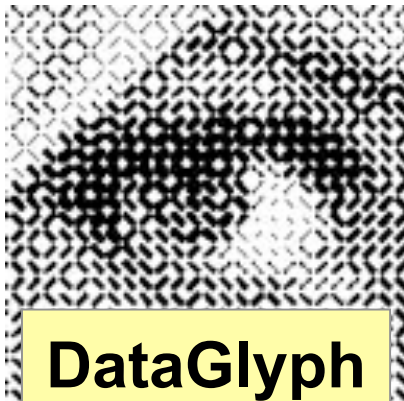
**Bar Code**



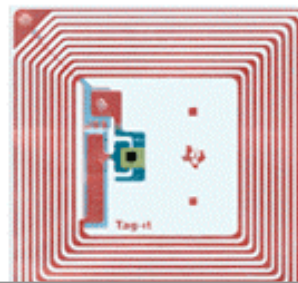
**UPS 2D Barcode**



**QR Code**



**DataGlyph**



**RFID**



**SemaCode**

# Videos

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- RFID



- Aura



# Physical Hyperlinks: Key Issues

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- Findability
  - How to know what you can use?
  - RFIDs invisible
  - Can be hard to find others unless obvious position
- Aesthetics
  - How to make the links attractive?
- Security?
  - Protect from print & stick.
- What content to link to?
  - Book barcode always go to Amazon?

# Summary

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