Computers and Media: Mobile Technology

CSCI 1200
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Mobile Media
Mobile Media

There are very few established companies in this area, it is wide open for new companies to innovate.

Mobile devices are always on, the user is always connected, how can we take advantage of this?

What do people want to do with a mobile device?
It is not a Small Computer..

Not a simple matter of transferring desktop applications to the phone
They are very different devices, so this rarely works
Need to develop applications that fit the device, take advantage of its strong points, avoid its weaknesses
Device Characteristics

Small and portable

The two main constraints in mobile devices are:
- Display size
- Input, particularly text

These tend to vary significantly from one device to another
Mobile Displays

Display size is limited by the size of the device, a large display would make the device too large to be convenient

In theory could have desktop resolution on a small display, but it would be unreadable..
Mobile Displays

One of the main problems with mobile displays is their range of resolutions.

Desktop applications can assume a minimum resolution that all displays can handle and is large enough for most applications.

A safe minimum for mobile devices would be too small to be useful for most applications.

Need to adapt to the range of display sizes:
- So most applications are designed for a specific device.
Projectors

Suggestion to add projectors to mobile devices, can use any convenient surface as a display

Problem: everything would be public, anyone could see what you are doing, interfere with your work

This could work in an office environment or at home, but these are the places where you are likely to use a desktop computer
Mobile Input

Input is also a major issue with mobile devices

Many mobile devices have the standard phone keypad plus a few extra buttons

Strong trend toward completely touch screen

This is the minimum that application developers need to consider
Mobile Input

The problem with the phone keypad is its hard to do text, a combination of keystrokes is required for each character.

The first solution was to add a limited keyboard to the phone, this has been used by RIM and Nokia.

The keys are small so typing can be difficult, no touch typing.

Not a full keyboard, need to use a variety of shift keys and other techniques.
Mobile Touch Screens

The current approach is to use a touch screen

Replace the display and keypad by a larger touch screen

Display a virtual keyboard for text entry

The main advantage is the screen is reconfigurable, can add any buttons you like

The main problem is it's still hard to type, can't feel the keys, easy to make mistakes
Mobile Phones are not Small Desktops

Can’t treat a mobile device like a desktop computer

Implications for applications:
- Can’t display a large amount of information
- Context switching is hard
- Can’t enter large amounts of text
- Pointing not always possible, no mouse
Mobile Device Unique Capabilities

Mobile devices are always on, no need to wait for them to boot up

Mobile devices know where they are, can use GPS to determine position, usually within 10 feet or less

This can be used for location based services (LBS), the information presented is based on the current location, relevant to right now, where you are
Location Based Services

iOS Yelp App: Monocle Feature
Mobile Device Unique Capabilities

Potential for a wider range of interactions
Can use camera to control the interaction, or motion sensitive devices
Mobile devices tend to have tighter integration of their features
Mobile Device Use

How do we use mobile devices?

North American usage patterns are different from the rest of the world, tend to lag

The CIP survey has some information on mobile device usage from 2007

Over 70% of Canadian households have at least one cell phone, there is an increasing trend here

2007 = Old News
Mobile Device Usage

In the general population 85% use a mobile device as a phone and 44% send text messages, the only other popular service is taking pictures with 36%

All other services are minor:

<table>
<thead>
<tr>
<th>Service</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Download ring tones</td>
<td>19%</td>
</tr>
<tr>
<td>Play games</td>
<td>14%</td>
</tr>
<tr>
<td>Surf Web or send emails</td>
<td>13%</td>
</tr>
<tr>
<td>Download music</td>
<td>10%</td>
</tr>
<tr>
<td>Watch Videos or television</td>
<td>3%</td>
</tr>
</tbody>
</table>

Mobile Device Usage

At first this looks fairly dismal, many of the advanced features aren’t used.

The survey also breaks down the data by age group, and this is where the interesting trends occur.

Text messaging is popular amongst younger users, with those under 18 texting more than they talk on their mobile devices.
Mobile Device Usage

It is the 45 and up groups where texting falls off, these groups also make very limited use of the other services.

Returning to our previous table we have the following of the under 18 group:

<table>
<thead>
<tr>
<th>Service</th>
<th>18+</th>
<th>Under 18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Download ring tones</td>
<td>19%</td>
<td>48%</td>
</tr>
<tr>
<td>Play games</td>
<td>14%</td>
<td>48%</td>
</tr>
<tr>
<td>Surf Web or send emails</td>
<td>13%</td>
<td>27%</td>
</tr>
<tr>
<td>Download music</td>
<td>10%</td>
<td>28%</td>
</tr>
<tr>
<td>Watch Videos or television</td>
<td>3%</td>
<td>7%</td>
</tr>
</tbody>
</table>
Mobile Device Usage

This is a significantly different usage pattern, and is similar to what we see in other countries.

Young people get old, does this mean that older groups will start using a wider range of services?

This is highly likely, so we should expect the development of new services in Canada and world wide.
Pew 2013 Cell Internet Use

Take 10 minutes, in groups, and review the Pew Internet 2013 Cell phone report:

http://www.pewinternet.org/2013/09/16/cell-internet-use-2013/
Services

What are the current opportunities?

What are the barriers to new services?

The opportunities most often mentioned are:

- Games
- Music
- Video
- Health Care
- Financial Services
Games

Has long been predicted to be a major winner, only happening in a real way in last 5 years

There are several good possibilities here:

- Causal games – good for spending short periods of time, easy to pickup and doesn’t make heavy demands on the device
- Networked games – good money earner for the carriers, social networking and location based games
- Spinoffs – additions to existing desktop and console games, good example is FIFA Soccer
Games

Why were games slow to take off?

One reason is mobile devices didn’t have good enough graphics and processing power until recently.

A related reason is the wide range of hardware configurations, games that work well on one device don’t work well on others, controls and screen sizes.
Game Distribution

Another reason is distribution channels

Until recently could only purchase mobile games from the carriers (e.g. Rogers/Bell), could only download from carrier site

If the carrier wasn’t interested in games, there was nothing you could do

Many carriers didn’t view games as a good source of income, so didn’t bother with them
Game Distribution Changes

Handset/OS manufacturers are now the main channel for distribution
  ◦ Apple App store
  ◦ Android Marketplace
  ◦ Blackberry App World

This gave game developers a more centralized distribution channel

EA is also exploring direct sales for mobile devices
Music and Video

Mobile devices now have a considerable amount of storage, can store many songs and full length videos

Currently most downloads occur through PCs or Wifi, they don’t use the phone network

This is a loss of revenue for the carriers, they could be getting a piece of the action, both in terms of bandwidth and their own stores
Music and Video

Music obviously fits the mobile experience, phone can take the place of music players

But what about video?

Most people won’t want to watch a full length movie on a phone:
- Screen size is too small
- Rarely have long period of uninterrupted time with the phone, would need to break viewing into several chunks
Music and Video

What types of video content fit mobile devices?
Video Content

Aim at video content that is around 5 minutes in length, this is what people will watch

News and sports casts follow this format, but would people be willing to pay for this?

A subscription model would work well here

This could also be a bundled service, sold as part of a phone plan
  ◦ E.g. movie previews from Cineplex app not counted toward bandwidth
Mobile Video

Another possibility is short episodes of popular TV programs

Could tie this to the TV program, provide additional content / non-linear narratives:
 ◦ Background for the TV show
 ◦ Alternative endings

This is an area where there are lots of possibilities, someone just needs to find the right format
Health Care

Most developed countries have an aging population, many of these people want to stay independent, live in their own homes. This raises a number of health issues, how can they be monitored to detect health problems? If someone is living alone they may not be able to summon help in a medical emergency, no one may know that they are in trouble.
Health Care

Elderly people should have their health monitored more regularly, but they have more difficulty getting to doctors than other people.

Idea: use technology to monitor their health.

Continuous monitoring of vital signs, can save the data and transmit to doctor, detect irregularities and call for assistance.

All of this could be coordinated through a cell phone.
Mobile Health Monitoring

Monitor heard rate & view electrocardiogram on Android phone

Gather motion and other sensor data from device for social sharing, health monitoring, gaming (Fletcher Lu @ UOIT!)

http://www.sciencedaily.com/releases/2010/10/101005085500.htm

Health Care

Phones are easy to carry so can have 24 hour/day monitoring.

Phones also know where they are, can be used to track people who tend to wander away (as long as they take their phone with them).

While this is a good idea, it hasn’t occurred yet, one of the main issues is privacy, the other is to get all the equipment manufacturers to agree to one standard.
Financial Services

Can access your bank account online, why not do this on your phone as well?

Could carry this a step further, store your money on your phone, not in your wallet

Have your phone act like a debit card, just need to present your phone to the cashier when making a purchase

Touch your phone to a vending machine when making a purchase instead of using coins
Financial Services

What happens if someone steals your phone, is all your money gone as well?

Makes it easier to steal your financial information

Need standards and a large number of companies need to cooperate

Hasn’t been viewed as something consumers really want, but maybe retailers might want it, easier to separate customer from their money
Mobile Web

A large portion of web use is now mobile

Many sites have a mobile and a desktop version for different screen sizes
Canadian Situation

Mobile has been slow to develop in Canada, several reasons:

- High data rates
- Small customer base
- Incompatible carriers

Data has been viewed mainly as a business service and not a personal service

Rates have been high because business have been willing to pay the high rates, the alternatives were more expensive
Canadian Situation

Rates are just coming down now, thanks to iPhone and similar devices

Small customer base means that Canadian developers must think globally, can’t rely on the local market to make a profit
Canadian Situation

This could be a win for us, if we play our cards right

GTA is one of the most ethnically diverse places in the world

Have local developers that speak many languages and understand many cultures

Should be able to produce applications for the world, internationalized to many different countries

This is an opportunity that is currently being missed
Canadian Situation

Carriers use different technology, their systems are incompatible

Further fragments our local market

Services either aren’t available or work differently

Forces developers to do more work, must produce slightly different application for each carrier

This is beginning to go away, but is still a major barrier
”How to live before you die”

Talk by Steve Jobs at Stanford University

http://www.ted.com/talks/steve_jobs_how_to_live_before_you_die
Summary

Younger generation views mobile devices as more than a phone, use a wide range of services

An area that is still under development, not clear how things will develop, good opportunities for new companies

Many false starts, need to think differently about how these devices will be used