Mobile Interaction

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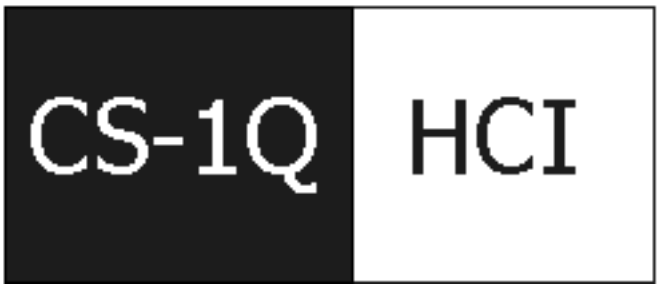


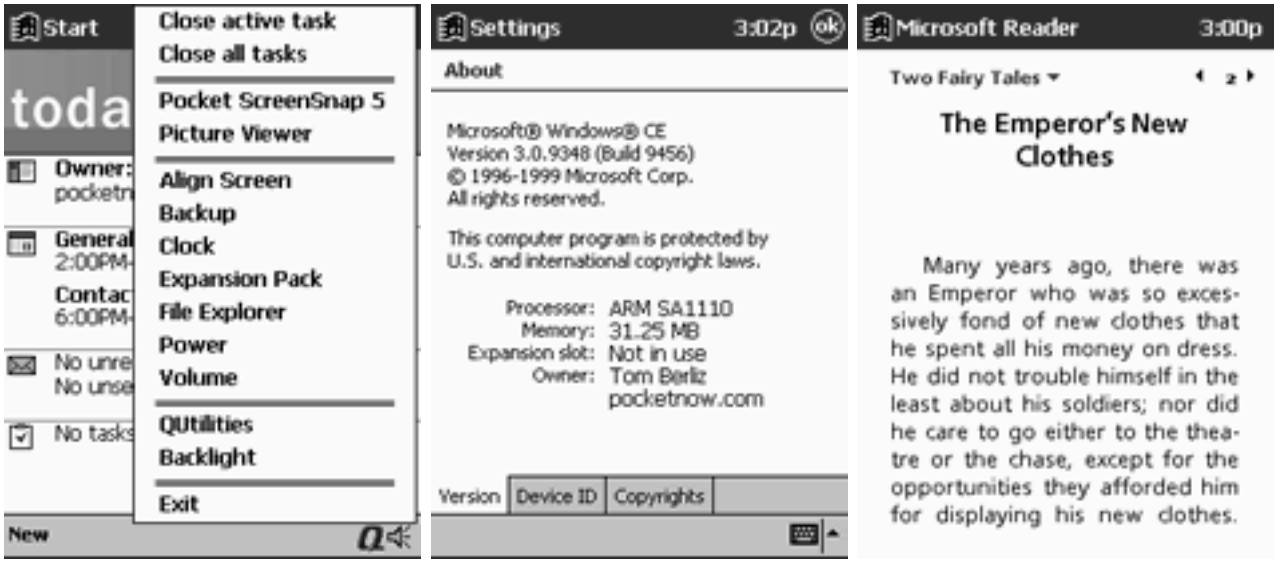
Mobile Interaction

- Input and output issues.
- Processor, battery and memory issues.
- WAP, G3 and Bluetooth.
- Context Awareness and GCS.
- Reality Checks...

Input and Output

- Display limitations:

- flicking through decks of cards;
- tiling, click to maximise;
- also 3D audio, tactile output.



Acknowledgement: T. Berlitz, www.pocketnow.com

- Input limitations:

- character recognition;
- automatic word completion;
- speech recognition;
- gloves and cameras.

Processor, Memory and Battery Limitations

- HP Jornada 710:

– 206MHz Strong ARM processor;

- 32MB RAM, 32 MB Flash Memory,

- Pocket Microsoft Windows Office.

Acknowledgement: www.hp.com

- 12-14 hours battery life.

Processor, Memory and Battery Limitations

- Compaq iPaq H3650:

- StrongArm 200 mhz
- 12 bit (4,096) color
- 32 MB RAM.

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- What can you do with them?

Wireless Application Protocol

- Similarities to desktop web:

- phone has a browser like on a PC;
- no special server is needed.

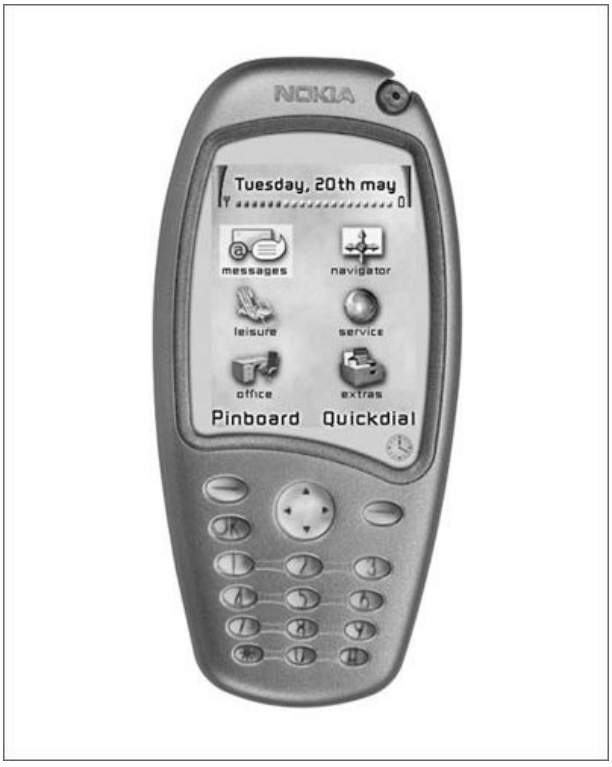
```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml.xml">
<wml>
<card id="Card1" title="Card 1">
<p align="center"> Happy Hippy's WML Demo<br/>
<big>This is card 1</big>
</p>

<do type="accept" label="Card 2">
<go href=">"
</do> </card>
<card id="Card2" title="Card 2">
<p align="center">
Happy Hippy's WML Demo<br/>
<big>This is card 2</big> </p>
<do type="accept" label="Card 1">
<go href=">"
</do>
</card>
</wml>
```

- But:

- HTML is now Wireless Markup Language;
- rules are more rigid to support small display.

Third Generation (3G)

"Peter Bodor, public relations manager at Ericsson:
"WAP's disappointment was caused by industry failure to manage expectations, and the main problem was its slowness. This won't be a problem with 3G. The 3G Internet experience will be as good as surfing from home, with the added benefit of location-based services making the experience more personal." `http://news.zdnet.co.uk/`



- What is 3G and why pay so much for licenses?

Third Generation (3G)

- Simplest 3G phones for talking and
- will store all their information on the network.

- Second type video-streaming, news and web.

- Third type will be 'information centres',
- more like conventional top-end PDAs.

- They will be equipped with *Bluetooth*.

Third Generation (3G)

- More technical information:

- 1st generation provide analogue voice telephony
- 2nd (current) generation add some data (fax and email)
- 3rd will provide data rates of up to 2 Mb per second.

- UMTS (Universal Mobile Telecommunications System)

- 3G standard being developed across globe;
- International Telecommunications Union (ITU);
- family of standards to switch between, not one

- Expectation that 3G will be here in 2002;

- based on EU's UMTS Decision for licensing schedule.

Bluetooth

• Local Area Network radio systems:
- IEC 802.11 (Apple AirPort, Lucent Orinoco;
- can be up to 10Mb/s depending on card;
- cover 50-200 meter cells depending on walls etc.

• But - need for shorter connections:
- connect laptop to your phone to your TV to your fridge.

• Infra-red (IrDA) communications:
- operate over a few meters, line of sight;
- difficult to maintain and slow data rates.

• Bluetooth:
- ow-cost, short range radio links;
- 1Mb/s with an actual data rate of 728 Kb/s.

• BUT - IEC802.11 now rivals Bluetooth!

Context Awareness

- Why are cell sizes important?

- inside GPS receivers will not work;
- so find out what cell a user is in;
- follow-me applications such as phone switching.

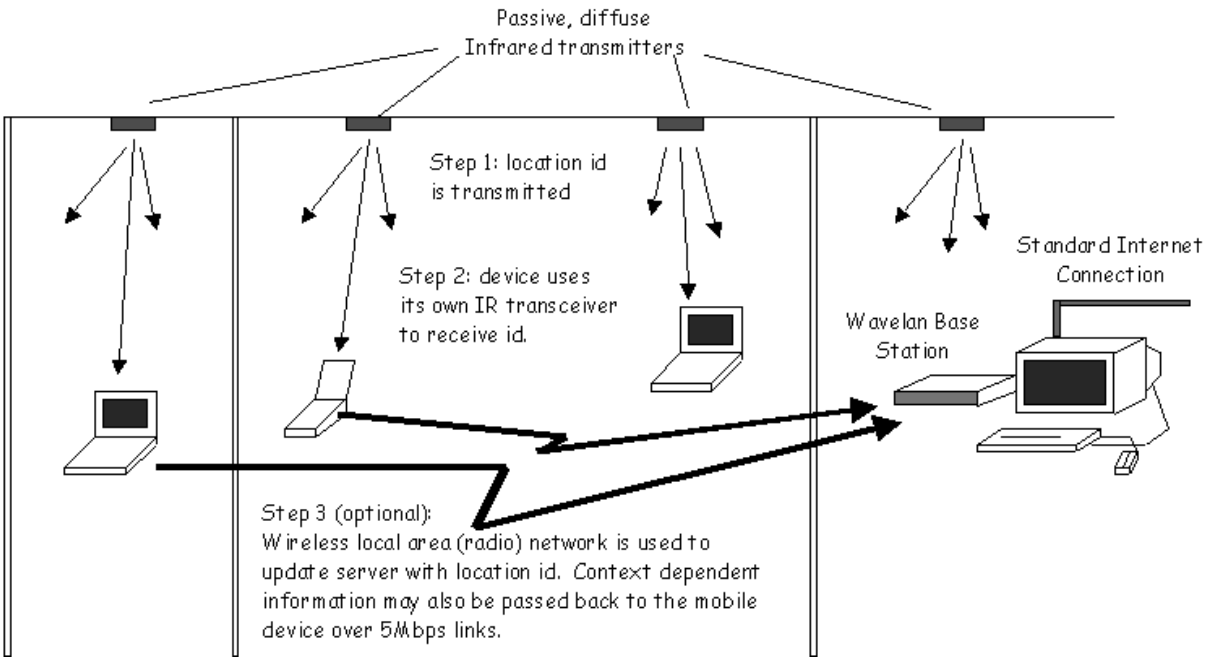
Acknowledgement: Olivetti and iButton.

- Alter information to users location.

Glasgow Context Server

- Key principles:

- passive location detection;
- 'off the shelf' hardware;
- uses infra-red and radio LAN (IEC 802.11).



- Currently working on human PAC-MAN.

Reality Check 1

- What will all these devices be used for?

- Nokia 9000 Communicator:

- developed, marketed and sold;
- all before anyone knew how it would be used.

- Market opportunity not user-centred design:

- but Nokia then do close observational studies;
- inform subsequent development of product;
- after initial market is established.

Reality Check 2

- Mobile devices pose huge challenges.

- Physical constraints demand new widgets.

- User tasks are difficult to predict.

- Users move and so are difficult to observe.

- Marketing hype often claims early adopters;

- difficult to anticipate longer term usability issues.

Summary

- Input and output issues.
- Processor, battery and memory issues.
- WAP, G3 and Bluetooth.
- Context Awareness and GCS.
- Reality Checks...

Further Reading

- Shneiderman isn't very good on this area.

`http://www.cs.strath.ac.uk/ mdd/mobilehci/procs/`

- Read a couple of articles instead?