Using Mobile Phones for Domain Specific Information Appliances

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Mobile Phones - A Versatile Platform

A wide variety of powerful mobile phones are available at low cost

Extensive multimedia functionality
- camera for still images and movies
- sound recording and playback
- extensive storage capability
- voice and data connectivity

Extensible with Bluetooth or WLAN
- mobile wireless printers
- GPS-receivers
- other mobile phone based appliances
- stationary computers

Open to third party developers
- operating system level (e.g. C/C++)
- JAVA (e.g. JAVA 2 Micro Edition).
- APIs to multimedia and network communication

Mobile Information Appliances

Usage domains
- conductors on trains
- facility management, security personnel
- delivery personnel of parcel services
- traffic and parking police

Typical tasks of mobile workers are information creation and access

Devices are designed for a specific usage domain. This makes such appliances only cost effective for large deployments.

Mobile workers often use paper and pens due to high costs of the development.

Mobile phones are a platform alternative.

Application and Evaluation

Case study: Traffic Wardens
- specialized appliance
- printed parking tickets
- cases are archived

Redesign using a Mobile Phone
Basic considerations
- let the human do what they are good at
- optimize the overall process
- minimize errors and improve documentation

Workflow
- human user judges the situation
- if there is a violation start a case and select a violation
- take a picture of the overall situation and of the number plate
- location data is automatically recorded via GPS using Bluetooth
- optionally provide audio comment
- transmit to server
- print a ticket via Bluetooth printer

Why a Prototype?
- Explore the concept
- Show practical advantages of such an approach
- Investigate the suitability of current hardware

Advantages
- variety of form factors at low prices
- good general usability of devices
- user’s familiarity
- good development support
- appropriate APIs
- short and long range network communication

Problems
- the battery time may be too short
- form factor (button and display size)

Implementation
- two different mobile phones
  - Siemens S65 and Nokia 6600
  - GPS device RoyalTek BlueGPS RBT-3000
  - mobile printer Brother MPRINT MV-140BT
  - software implementation in JAVA

Guidelines for Designing Information Appliances on Mobile Phones
- selection of the central device
- selection of additional devices
- make use of the capabilities to link the real world efficiently with the virtual world
  - accelerates the workflow
  - helps to prevent human errors
  - restrict the functionality to support the task

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