

Location Based Services & Mobile GIS/Cartography

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BUZZWORDS:

mobile cartography ~ WebGIS ~
Webcartography ~ telecartography
~ Location Based services
~ distributed GIS
wireless web ~
wireless information devices
smartphones ~ PDA's ~ PocketPC's

"Where will it end...?"

“...CUE TOM CRUISE...!”

[‘Minority Report’ - Steven Spielberg, 2002]

Washington 2039:

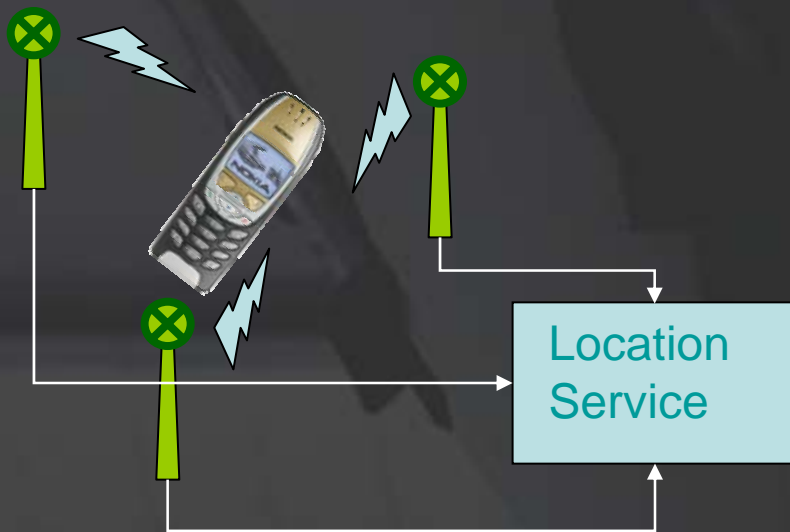
John Anderton
on the run for the
‘pre-crime’ police...

ALL ELEMENTS ALREADY EXIST...

1. Positioning – localising

Localising of person / device by the network

- biometry (iris-scanner / fingerprint)
- magnetic (smart-cards, smart-keys)
- radiometric (transponders / GSM cell-timing)



ALL ELEMENTS ALREADY EXIST...

1. Positioning – localising

Positioning by device (using network)

- feedback of network-positioning (eg. by SMS)
- Global Positioning Systems
- Inertial Navigation Systems
- GSM / UMTS self-positioning



ALL ELEMENTS ALREADY EXIST...

2. Location aware GIS

- distributed data + applications
- locations of services, objects and persons

3. Location based services

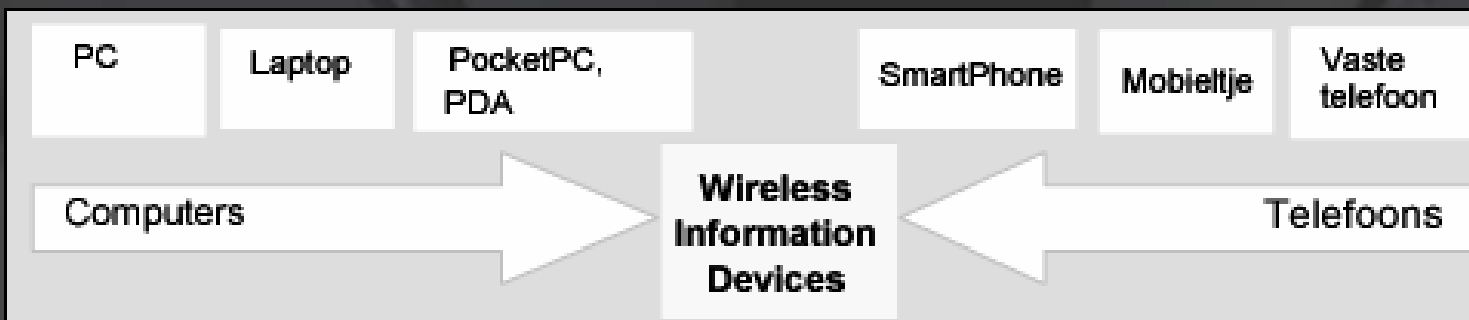
- matched to combination of person+position



ALL ELEMENTS ALREADY EXIST...

4. Mobile information devices (MIDs)

- graphic and alphanumeric display
- simple user interface
- portable



ALL ELEMENTS ALREADY EXIST...

5. wireless connections between the parts

- between MIDs and network (WIDs or using phone)
- between MIDs themselves (IR, bluetooth)
- between MID and user (speach, 3D-gloves)



ALL ELEMENTS ALREADY EXIST...

Many working examples are 'out there'

eg.:

- Bata Positioning System
- Wireless Campus LBS
- GeoTracing
- ...many more...

GeoTracing

"Classic GIS": WHAT+WHERE

- maps with features

GeoTracing: WHAT+WHERE+WHO+WHEN

- user-centric, time-based layers
- allow "Digital geo-story telling"

GeoTracing applications allow users to

- track and share their movements
- users can enter
 - impressions/annotations in the form of media
 - features like Points of Interest
- viewed in real-time on a (Google) Map

GeoTracing: 'mash-up' technology

Put together in a pragmatic way

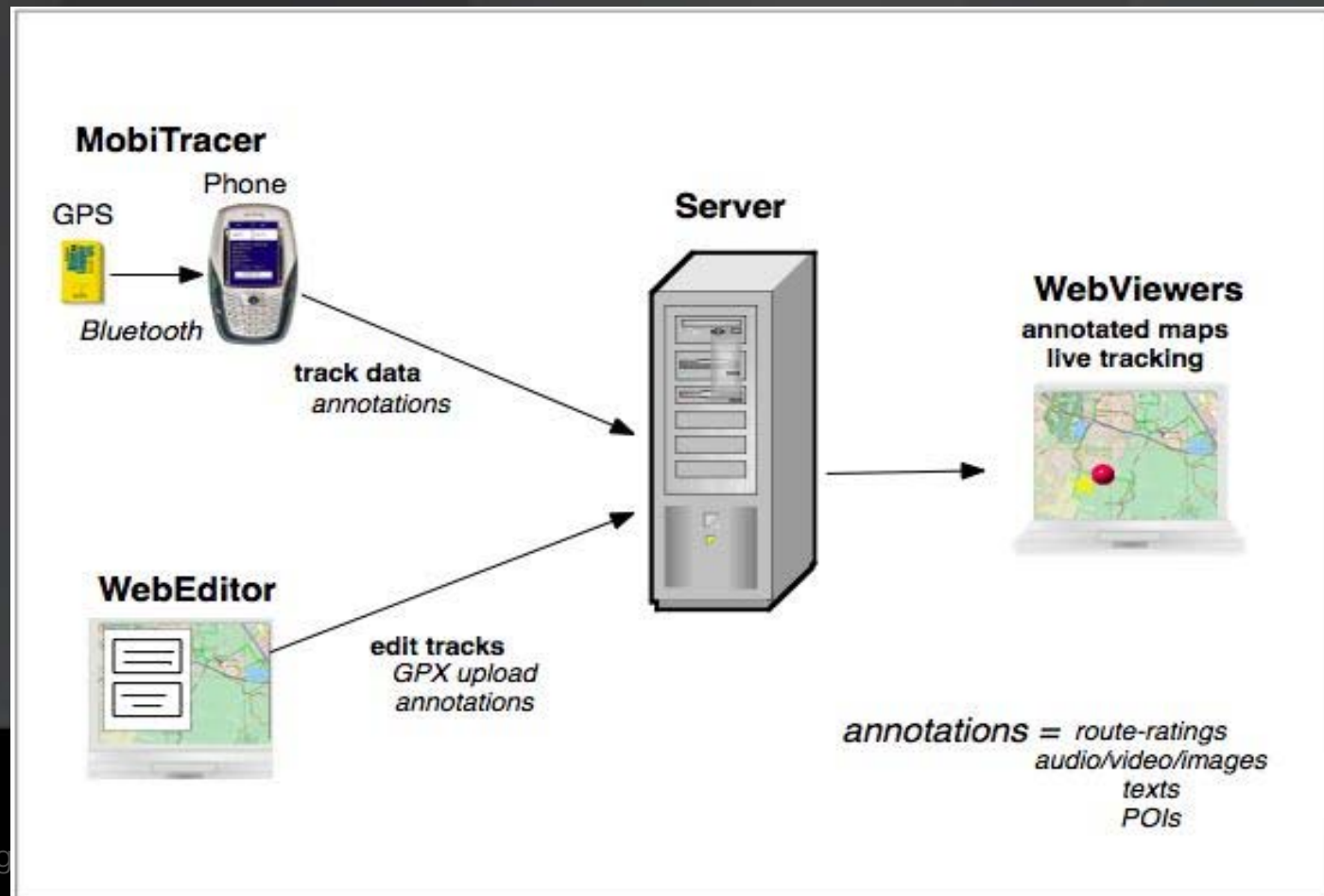
Existing webservices (Google maps)

Combined with own work

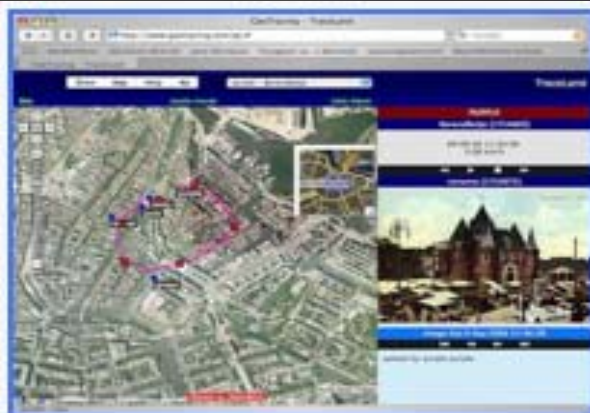
- Java based

Browser technology

- AJAX paradigm



GeoTracing: <http://www.geotracing.com>



Traceland



GeoSailing



N8Spel



OtterTracing



GeoSkating



Sense of the City

WHAT'S MISSING?

COVERAGE:

everywhere, always, immediate & accurate

- position with quality (indoors and outdoors)
- connection with capacity (GPRS, UMTS)

WHAT'S MISSING?

COVERAGE:

everywhere, always, immediate & accurate

DATA & GIS:

operational, independent components

- technical standardisation (openGIS)
- semantic standardisation (semantic Web)

WHAT'S MISSING?

COVERAGE:

everywhere, always, immediate & accurate

DATA & GIS:

operational, independent components

MARKET:

proven 'business-models'

- 'killer-app' 'the sms of lbs' ☹️
- integration in accepted services
I-mode ☹️ DoCoMo 😊

WHAT'S MISSING?

COVERAGE:

everywhere, always, immediate & accurate

DATA & GIS:

operational, independent components

MARKET:

proven 'business-models'

KNOWLEDGE:

mobile cartography

- cartographic design for MIDs
- user aspects of MIDs

MOBILE CARTOGRAPHY

adapt design to circumstances:

- small screen
160x160 (WAP) – 208-320 (GPRS) - 240x320 (PDA)
- low resolution
- limited colours
b&w (WAP) – 16bit (PDA)
- small files
- limited interaction
numerical pad (WAP) – touchscreen (PDA)



MOBILE CARTOGRAPHY

solutions are being developed:

- server-side technology
- adaptive user interfaces + intelligent, adaptive generalisation
 - adaptation to person
 - adaptation to usage (user tasks)
 - adaptation to time/date
 - adaptation to bandwidth

...and of course always to location!

ADAPTIVE INTERFACES & GENERALISATION

- adaptation to person
- adaptation to usage (user tasks)
- adaptation to time/date
- adaptation to bandwidth

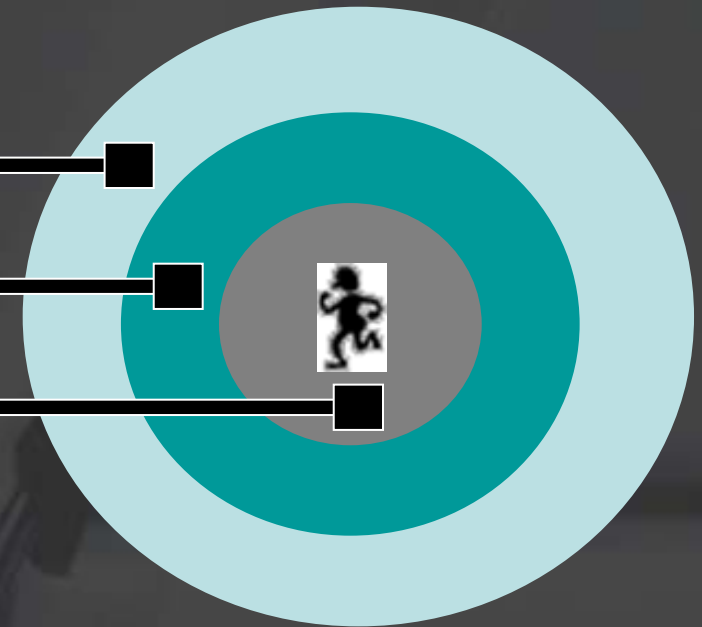


navigation “maps” [Kolbe]

objects for context/overview
(eg. hills, ringroad)

planning-objects
(eg. towers, main roads)

reference-objecten
(eg. houses, streetnames)



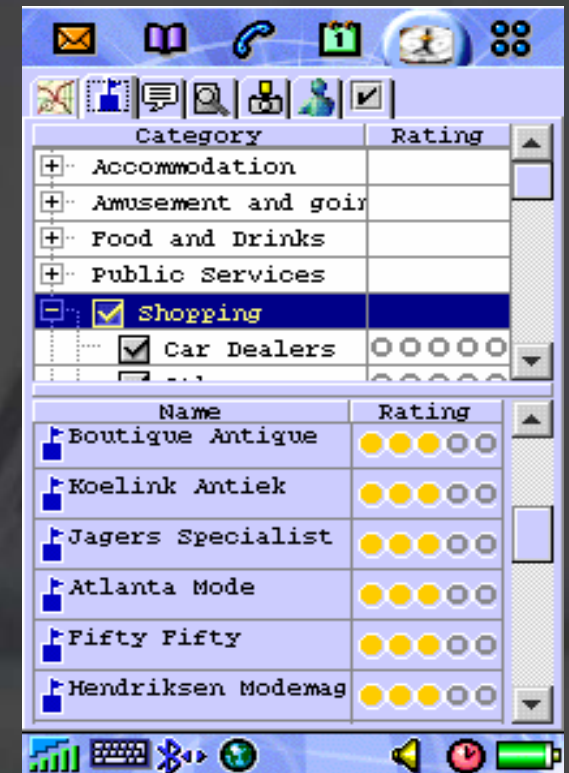
“ego-maps” generalisation [Reichenbacher et al.]

ADAPTIVE INTERFACES & GENERALISATION

- adaptation to person
- adaptation to usage (user tasks)
- adaptation to time/date
- adaptation to bandwidth



GiMoDig project
[Sarjakoski et al.]



Tourist Compass Enschede

MOBILE CARTOGRAPHY

solutions are being developed:

- server-side technology
- adaptive user interfaces + intelligent, adaptive generalisation
- vector formats, standardised and optimised for MIDs & Web
(eg. SVG Basic & SVG Tiny)

HOW DOES IT END?

Mobile cartography, LBS, distributed GIS,
probably are common practice long before
2039...

HOW DOES IT END?

Mobile cartography, LBS, distributed GIS,
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...and for John Anderton...?