Digital Graffiti

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Corporate Technology
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Digital Graffiti

... is a technique which allows

- to associate information virtually to any position

- to visualize information location and situation dependent on an appropriate device (e.g. a mobile phone or a PDA)

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Digital Graffiti

**... is a special kind
of Location Based Services:**

- Information can be created
  by everybody
  at each location
  at each time
  for a certain period of time

- Each person approaching this location can
  receive this information

- Group of addresses can be limited:
  this allows limitation of information access
  to a well specified group of people

- Recipients can filter information to avoid
  information spamming

- Normally, Digital Graffiti is associated to a fixed
  position; it can also be mobile by associating to
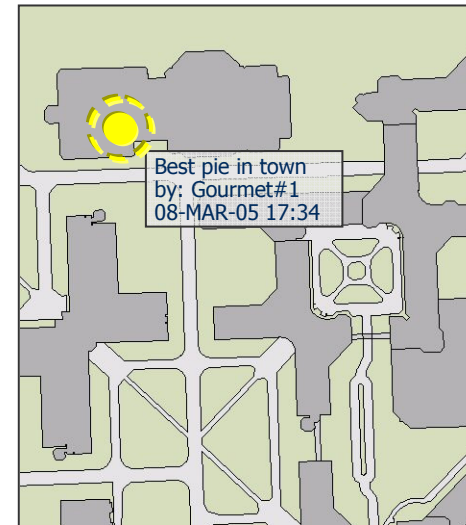 a mobile object

Digital Graffiti is a Push Service

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Aspects of a Digital Graffito

- Summary:
    - Graffito title
    - Author
    - Creation date
- Content,
  any combination of
    - Text
    - Pictures
    - Links to other information
    - ...
- Lifetime
- Field of visibility
- Recipients
    - persons specified by name
    - persons specified by attributes
      or interests

Best pie in town
by: Gourmet#1
08-MAR-05 17:34

Hier gibt es die besten Pies in
der Stadt.
Egal ob süß oder pikant, alle
sind super.
Insbesondere zu empfehlen:
Apple Pie mit Cream.

Examples of Consumer Applications

Tourist Information

- Description of a building,
  its opening hours,
  special attractions, ...

- Explanation of an object,
  of a sculpture, ...

- Visualization of guide tourist route and
  description of the passed points of interest

**Predefined location- and time-specific information
presented to an anonymous
group of addressees
in a specific context**

Summary

Spielzeugmuseum
by: Stadt München
15.10.2003 09:36

Description

Turm des alten Rathauses am
Marienplatz, beherbergt das
Spielzeugmuseum.
Über die vier Stockwerke des
Turms breiten sich liebens-
werte Schätze aus der Vor-
Game-boy-Ära aus. Die
Ausstellung, die Jung und Alt
beeindruckt, zeigt auch das
neueste Sammlerobjekt:
Barbie und die Ausstellung
"Teddybär 100 Jahre alt".
Täglich 10:00-17:30

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Examples of Consumer Applications

Comments and Annotation in a Tourist Environment

- Comments about a tourist attraction, a work of art, ...

- Individual recommendations of a restaurant, of a performance, a movie, ...

- Individual warnings of special danger or difficulties, e.g. at a mountain trip

Individually created location- and time-specific information presented to an anonymous group of addressees in a specific context

Summary

Spielzeugmuseum
by: Ilovetoys
26.12.2004 15:24

Description

Im Vergleich zum Spielzeug-
museum in Nürnberg wirkt
das Münchner Spielzeug-
museum geradezu winzig.
Aber bei der Darstellung der
Geschichte der Teddybären
hat es die Nase eindeutig
vorne. Ich würde es jedem
München Besucher als kleines
Appetithäppchen zwischen-
durch empfehlen.

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Examples of a Industrial Applications

Support of Maintenance Groups

■ Step 1:
Marking of damaged places and describing of necessary repair activities by an inspection group

■ Step 2:
Retrieving the damages places and repairing the damage by the repair group

At airports, damages on run ways or taxi ways must not be marked with conventional paint to avoid irritation of pilots.

Individually created location- and time-based information for a well-specified group of addressees in a specific context

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Examples of Consumer Applications
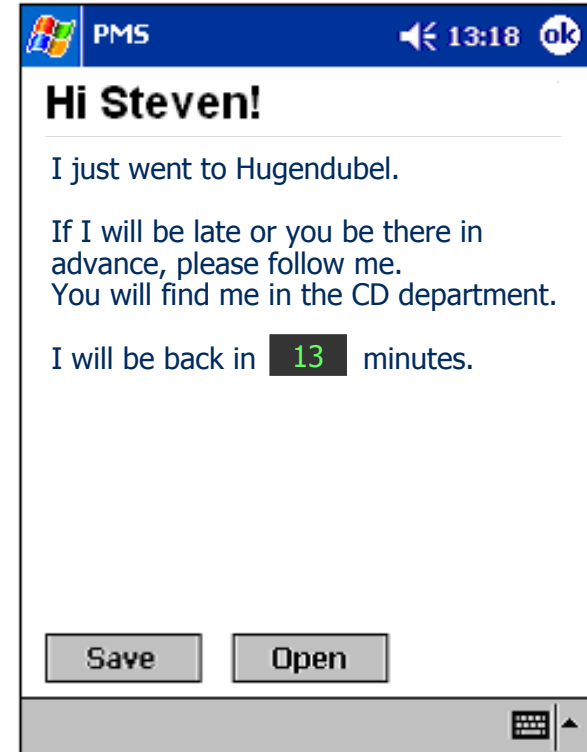
Personal Messages

... to oneself

- personal records with location context
  ("their '98 Barolo was excellent";
  "next time I should visit this restaurant")

... to friends

- Information about temporary absence
- Information about time until expected return

Individually created location- and time-based information for a well-specified group of addressees in a specific context

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PMS ◀€ 13:18 **ok**

Hi Steven!

I just went to Hugendubel.

If I will be late or you be there in advance, please follow me.
You will find me in the CD department.

I will be back in `13` minutes.

[Save] [Open]

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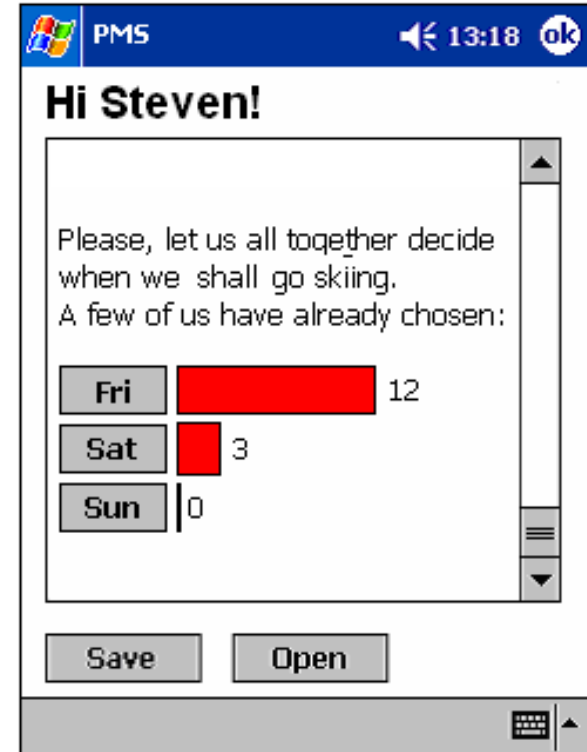# Examples of Consumer Applications

**Interactive Messages
... Polling**

- Polling mechanims for votes

... Gaming

- Retrieval of instructions at specified locations (Schnitzeljagd)
- Dropping signals and creating tracks
- Supervising the position of the other players

Individually created location- and time-based information for a well-specified group of addressees in a specific context

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Examples of Consumer Applications

Personal Locator (Friend Finder)

- Providing information about my current position for my friends

- Getting information about the current position of my friends

- Information will be updates permanently during the lifetime of the graffito

- Tracking terminates when the graffito will be deleted

Individually created location- and time-based information for a well-specified group of addressees in a specific context

Application Areas

Consumer
- (Official) tourist information
- Comments, remarks of tourists about sights, restaurants etc.
- Reminders at "fridge door"

Office
- Information about meeting (location, time, agenda, ...)
- Information about current position of people or objects
- Work instructions

Industry
- Information about necessary maintenance activities and recording of performed actions
- Virtual user interface: visualization of device parameters and measurements; setting of device parameters

Traffic
- Marking and retrieving damages at airport, railway, or road (position and description), recording of performed actions
- Virtual parking ticket

Medical
- Patient's log file and required treatment
- Usage log file of devices
- Current position of mobile devices and people

Security
- Time stamps of inspection round

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Types of Content in Digital Graffiti

Static Content

- Text
- Drawings
- Pictures
- Audio notes
- Video clips
- Routes
- Answers, comments
- ...

Dynamic Content (Smart Graffiti)

- Timer
- Counter
- Voting value
- Link to a web page
- Link to a database entry
- Position tracker
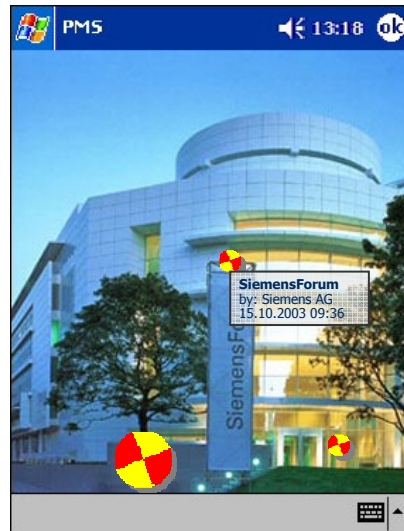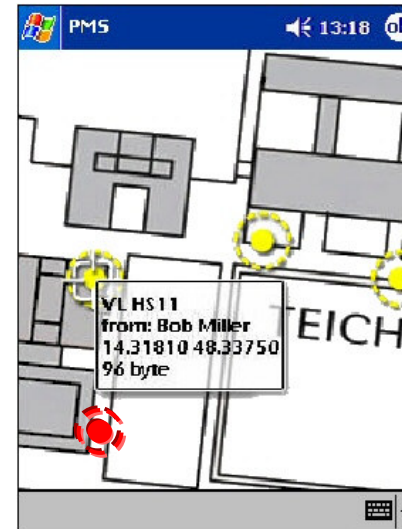- ...

Content types can be combined

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Visualization of Digital Graffiti

... in a map

- A map shows
  the current position of the user
  and the positions of all visible graffiti
- The user can select each graffito:
  the map shows an abstract of the graffito
- The user can open each graffito:
  the display shows the graffito content
  in an appropriate way

... using Augmented Reality

- A camera captures the view of the environment
- The graffiti positions are embedded into the camera view
- The size of the graffito symbol corresponds to its distance
- The user can select each graffito:
  he moves the camera until the graffito symbol is centered;
  the abstract of the graffito appears in the camera view
- The user can open each graffito:
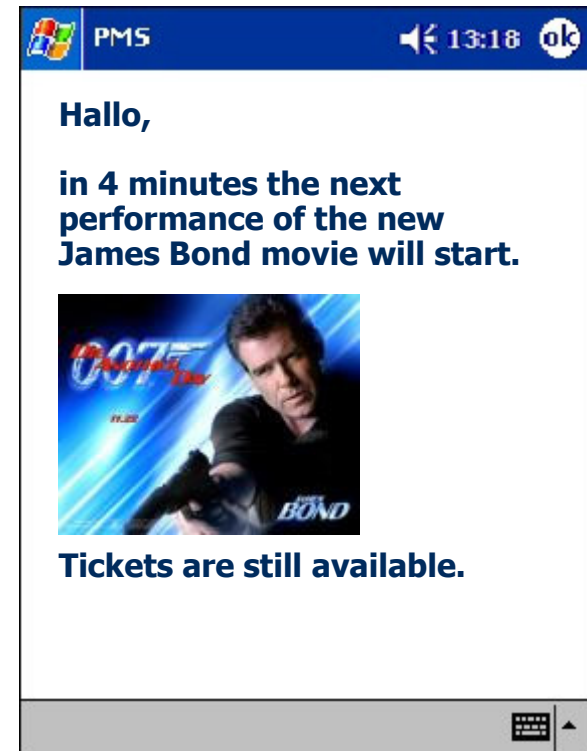 the display shows the graffito content in an appropriate way

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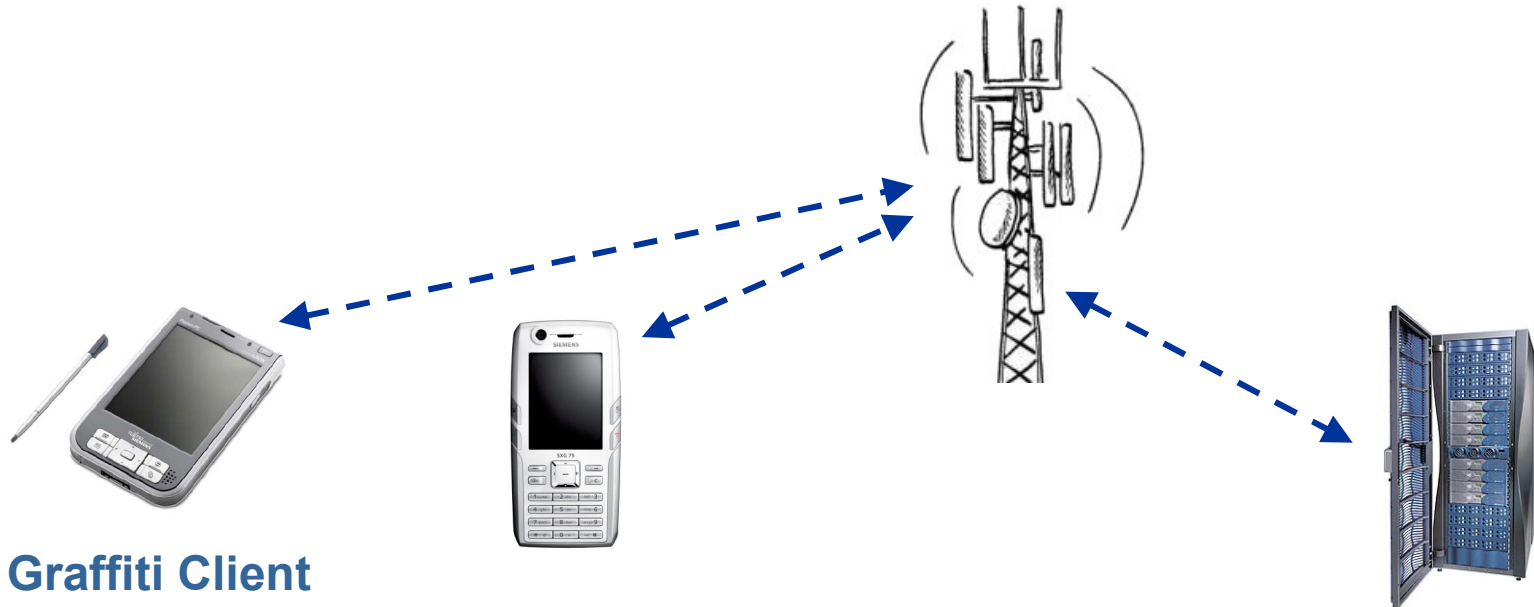Techniques

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Visualization of Digital Graffiti

... as pop-up information

- The graffito content appears automatically in the display when the user enters the visibility area of the graffito

- The graffito disappears automatically from the display when the user leaves the visibility area

- Outside of the visibility area of a graffito, the display shows he map with the current position of the user

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Digital Graffiti - How It Works

Graffiti Client

- Knows the current position of the user
- Displays graffiti in a map
- Shows the content of the selected graffito
- Creates and edits graffiti
- Runs on Windows Pocket PC 2003 and as Java application on mobile phones

Graffiti Server

Stores

- Graffiti content
- Maps
- Client profiles

Client and server communicate via GPRS / UMTS and Internet

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Techniques for Position Detection

... outdoor and indoor

- GPS / A-GPS
- Galileo
- Cell Ids
    - Bluetooth
    - Wireless LAN
    - Mobile phone
- WLAN signal strength
- RFID
- Analysis of camera image
    - Marker detection
    - Image identification
- ...

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Differences between Digital Graffiti and SMS and conventional Location Based Services

SMS vs. Digital Graffiti (DG)

- SMS delivers a message immediately;
  DG delivers a message only if the recipient is at the location of the message and if the message is still valid

- SMS delivers a message to well specified recipients;
  DG may deliver a message to an anonymous group of recipients

- SMS delivers a message always to the specified recipient;
  DG delivers the message only if the recipient is interested in it

Location Based Services (LBS) vs. Digital Graffiti (DG)

- LBS will be created and maintained by special content providers;
  DG can be created by everybody

- LBS are messages to everybody;
  DG can be addressed to specified people or communities

- LBS are one-way messages, from the provider to the recipient;
  DG can be commented by the recipient

- LBS is a pull service; DG is a push service

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Demonstration of Digital Graffiti

... on the DLR area

- 2 Fujitsu-Siemens Pocket LOOX 720
- Holux Bluetooth GPS mouse
  for position detection
- Connected via GPRS
  with the graffiti server

- Several predefined graffiti
  containing text, pictures, and sound
  are placed on the DLR area
- Additional graffiti can be created by
  the participants of the demonstration
- The client shows its current position
  and the position of the other client

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Thank you

for your attention

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