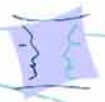
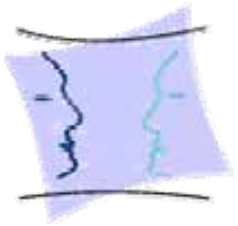


Web Services as Building Blocks for Context-Aware Applications



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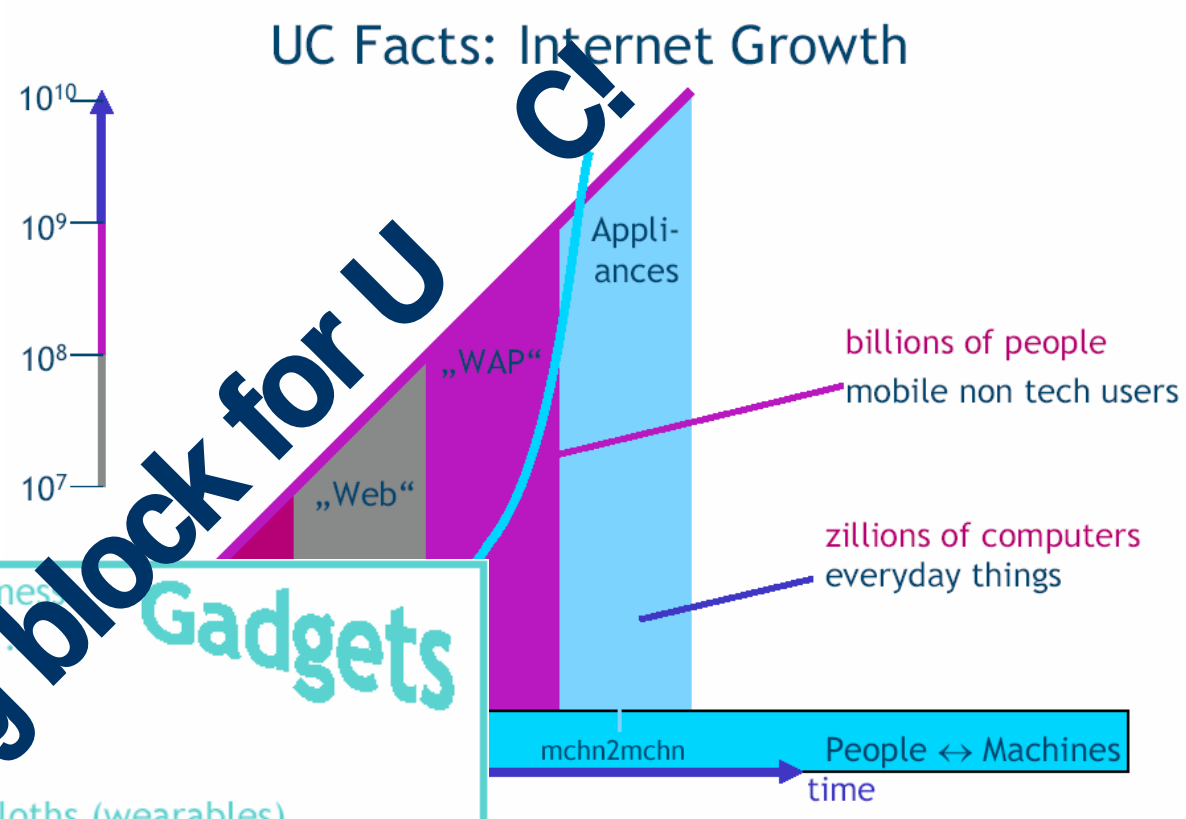
Context in (Mobile) Computing

UC world:
- autonomous...
- ...action
- no „interface"



location / time / temp./... awareness
ambient walls / offices / homes /...
augmented reality
pico / ad-hoc networks
Internet appliances
smart labels - badges - devices, cloths (wearables)
smart cars (/WebOn Wheels) - goods & spaces - paper ... dust

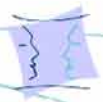
Gadgets

Building block for U C!

- ADAPTABILITY
  - wrt. „sensed" context (smart, ambient, location++ - aware)
  - wrt. „computed" context (device- / user- / activity- awareness)

Context in (Mobile) Computing

- Goal:
  - Applications, environments… that reduce cognitive load on users to fulfil a task?
- How:
  - Restore environment of room depending on participants (login and load slides,…)
  - Turn device on/off, filter incoming messages depending on location, time, situation (lecture, cinema, meeting,…)
  - Automated filling-in of forms (location, time in HEAG timetable)
  - Present information depending on output device
  - …



What is context?

- Context (Dey):

  Context is **any information** that can be used to **characterize the situation of an entity**. An entity is a **person**, **place or object** that is considered **relevant** to the interaction between a user and an application, including the user and application themselves.

- Context-Awareness:

  A system is context-aware if it uses context to **provide relevant information and/or services to the user**, where relevancy depends on the user‘s task.

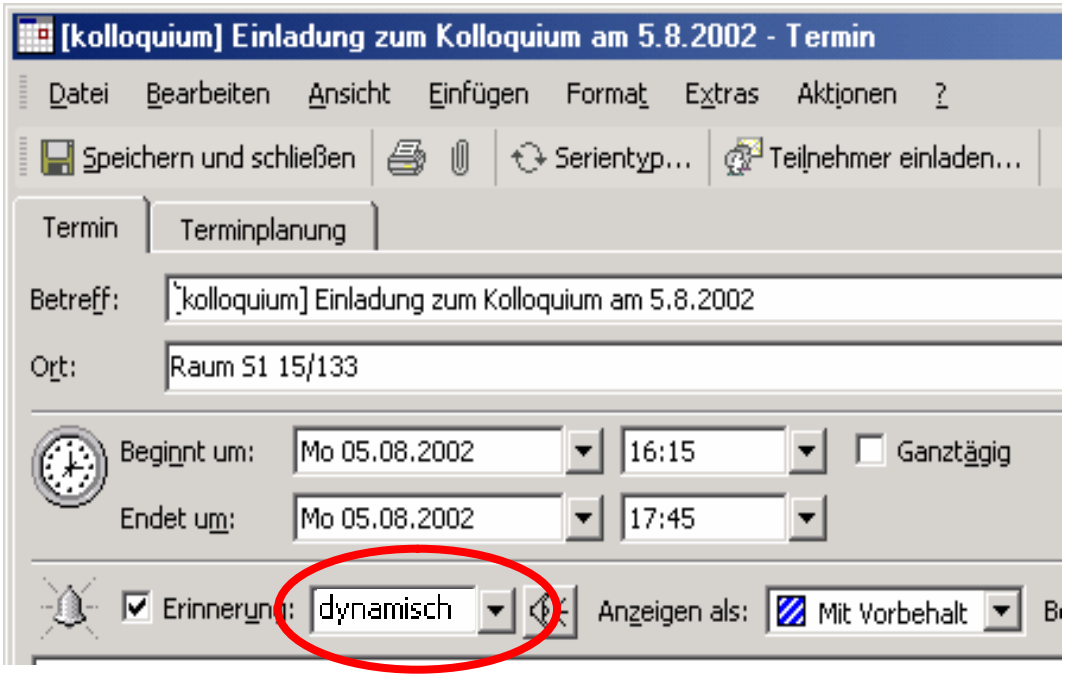
- Kontext (Schmidt/Gellersen):

  Abstrakte Beschreibung der Situation oder von **signifikanten Merkmalen** der Situation in der lokalen Umgebung eines Benutzers.

- System mit Kontextbezug:

  Ein System das die Fähigkeit hat Aspekte der Umgebung als Kontext zu erfassen und diese für ein **situatives Verhalten** zu nutzen.

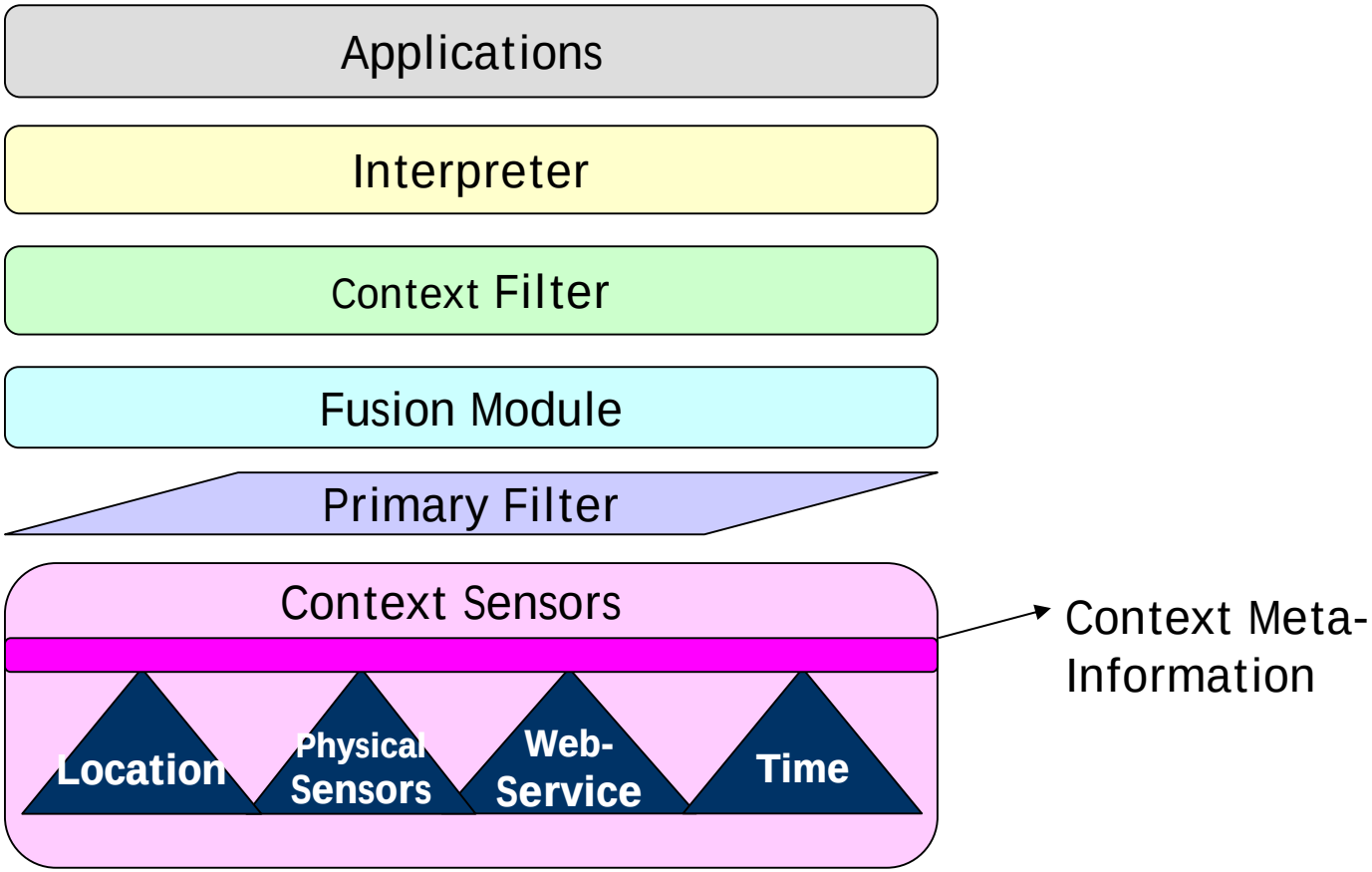
Motivation - Scenario



Research Objectives

- Context Representation and Retrieval System
  - Still most times physical sensor paradigm, but **more complex context** is needed
- Context Data Fusion, Filtering, Interpretation, Prediction
  - Several sensors represent one context
  - Person enters/leaves a room
  - People on one place, noise level -> meeting, lesson
  - What's the next room a person will go into

General Model For Context Aware Systems

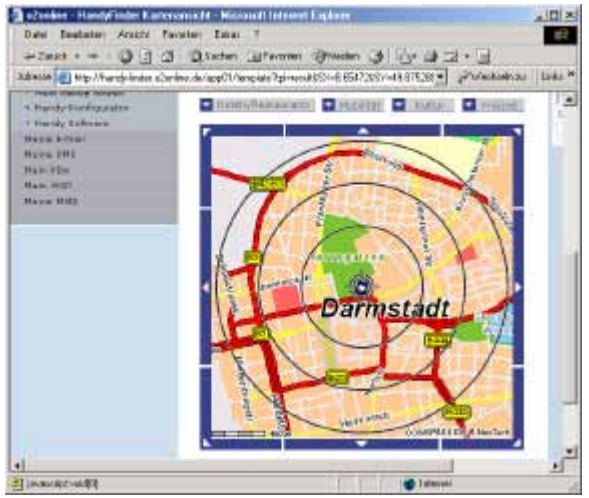


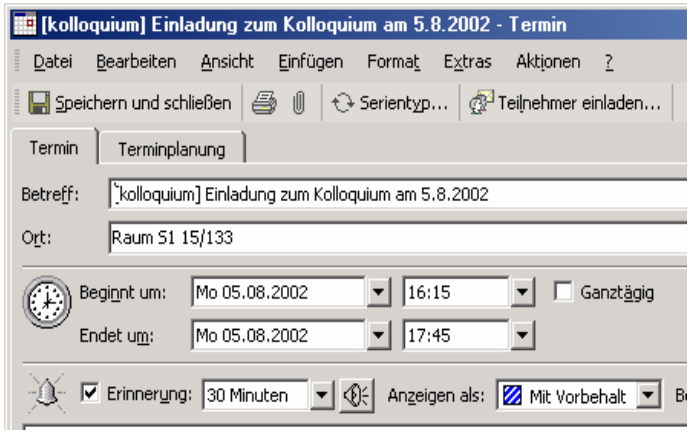
Building Blocks

RMV-Time-table

Cellular Phone

O2-Handyfinder





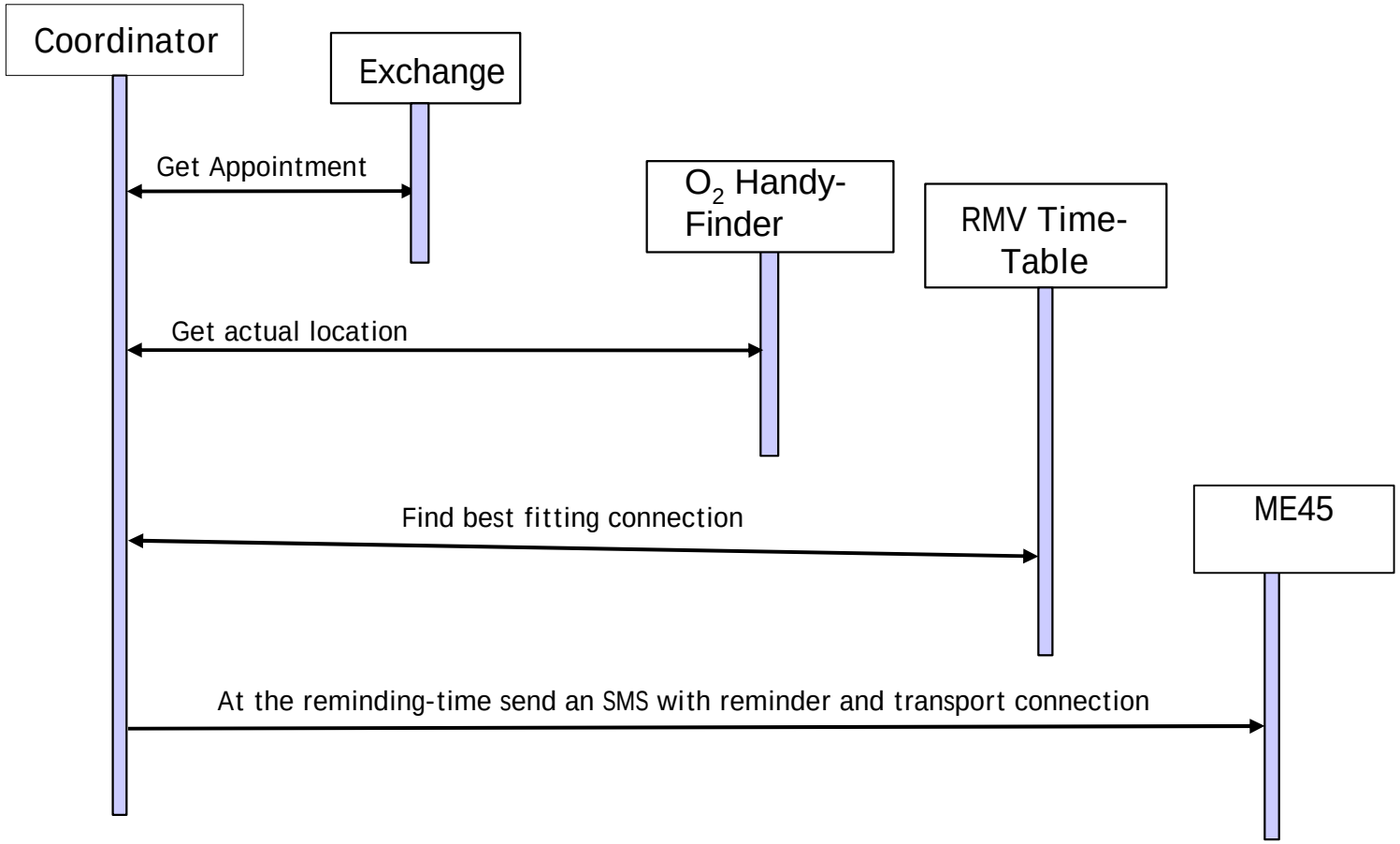
Exchange Server

Nokia D211

Application of our Model

Application	Automatic reminder with public transport connections
Interpreter	Logic
Context Filter	Significant context change
Fusion Module	Translation of formats
Primary Filter	Frequency of requests
Context Sensors	O_2 Location Service, Exchange, RMV, Time

Logic Sequence Diagram



Hurry Up!


ME45
Loslaufen!
Haltestelle:
Hauptbahnhof
Meeting: ab:
24.06.03 18:10,
Ort:
Antwort
Optionen
SIEMENS

Concerns

- Privacy:
  - Who gets information about my current context?
    - Location based services need my location to process but I don't want them to be able to track me.
    - I don't want my boss to know how much time I spend per day in the coffee kitchen.

COMPUTER

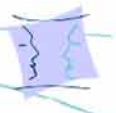
Verräterische Etiketten

Winzige Funkchips auf den Waren im Supermarkt sollen bald den Strichcode ersetzen. Doch die Technik ist auch zum Überwachen der Kundschaft geeignet.

RFID
Spiegel Nr. 31 / 2003

Discussion

- Are Web Services a suitable technology for UC/CTX?
- Yes…
  - Broad support for tools by industry
  - Much effort put into standards
  - "Managers like Web Services"
- …but…
  - Hardly any free Web Service available (amazon, google, …)
    - No benefit for provider → micropayment
  - Will there be standards (interfaces) for everything?
  - How to find services?
  - Too heavy-weight (in some scenarios)
  - Applications interested in changes → push needed



Thanks for your attention!