

# User Profile Management for Personalizing Services in Pervasive Computing

Olivier Coutand, Michael Sutterer, SianLun Lau, Olaf Droegehorn,  
Klaus David

Speaker: Olivier Coutand

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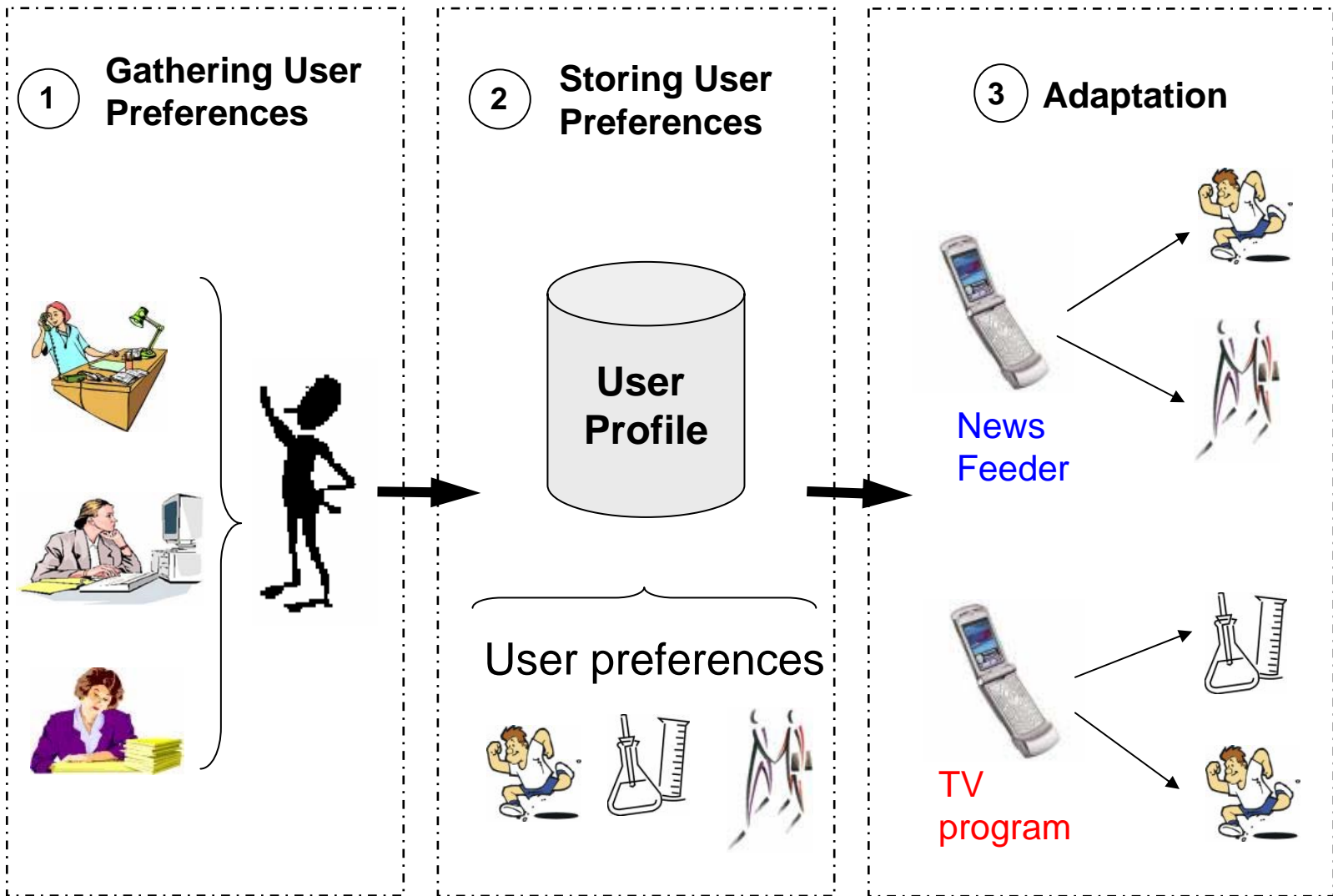
# Outline

- **Service personalization**
- **Requirements on user profiles for service personalization**
- **Current Profile Management systems**
- **Our approach**
- **Conclusion**

# Service personalization

- **Personalization**
  - Adapting services to user's preferences
- **Advantages**
  - Assisting the user when interacting with the service
  - Providing accurate information to the user
  - No exchange of redundant data
- **Future type of service personalization**
  - adaptation to user's situations and environments
    - Context-awareness
    - User's preferences changing in different contexts
      - Location, activity, time, ....

# Personalization process





# Requirements for Profile Management

- **Common profile for user preferences**
- **Avoiding storage of redundant preferences**
- **Providing different services with context-dependent preferences**
  - Preferences changing according to the context
- **User privacy**
  - The description of the user's context should not be passed to the untrusted service
  - Confidentiality of user preferences
    - Authorized services only

# Profile Management systems

- **Profiles for assisting web navigation**
    - **Storage of information about the web pages visited**
      - **Bookmark-like fashion**
      - **Lists of concepts (*words*) in the page**
      - **Hierarchy-arranged collection of concepts**
    - ⇒ **A profile serves one specific service (for web navigation)**
  - **Profiles in mobile devices**
    - **CC/PP (composite capability/ preference profile) and UAProf (User Agent Profile)**
      - **general profile formats to describe the capabilities of a user**
    - **GUP (General User Profile)**
      - **Hierarchical structure, described using the Data Description Model**
- ⇒ **No context-dependent data in the profiles**

# Our Approach

- **A Profile Management System**
  - User preferences are stored in one common profile
  - Views to structure the profile
- **Separating meaning and value of data**
  - Data is stored once accessed by different services
- **Contextual annotation**
  - Only relevant data w.r.t. the user's context are passed to services

# Context-dependent view

Description of  
the service

Description of  
the context

View "layer"

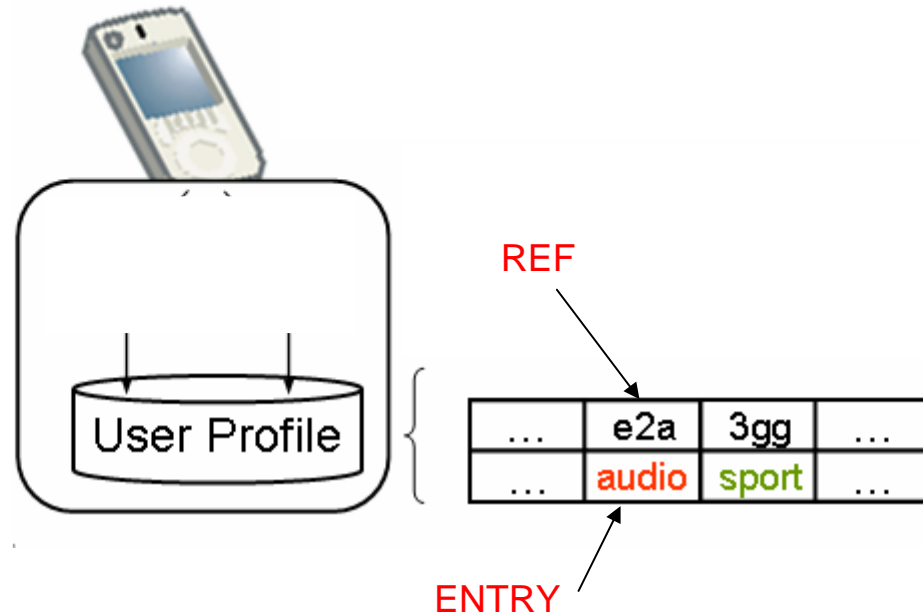
Service qualifier		Context qualifiers	
#name	#city	#hobby	
11a3	e92b	r5f2	

Profile "layer"

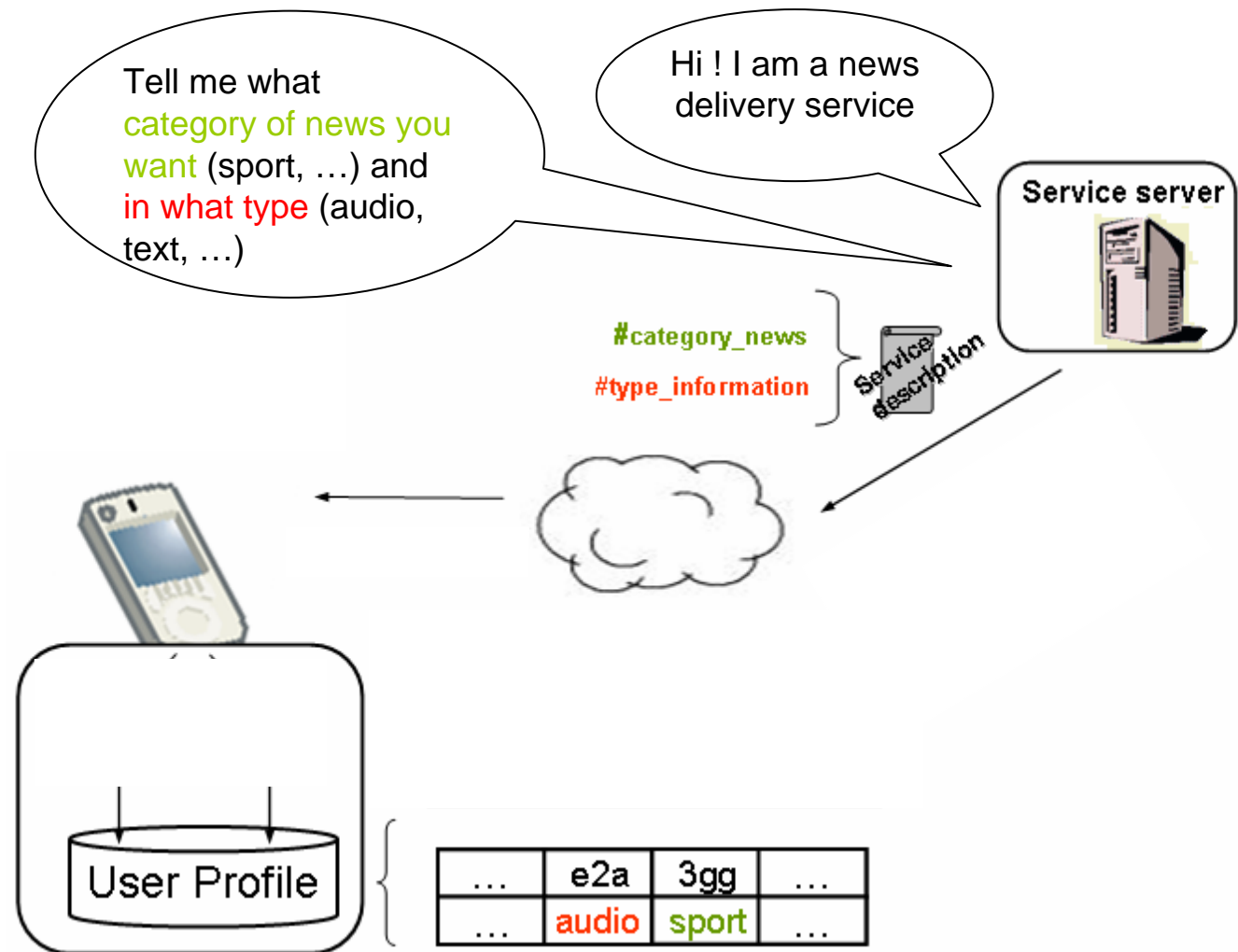
5v45	33cf	11a3	e92b	r5f2	e23rt
Rule 3	16	Dave	Berlin	Rule 1	Rule 2



# Personalizing services using views

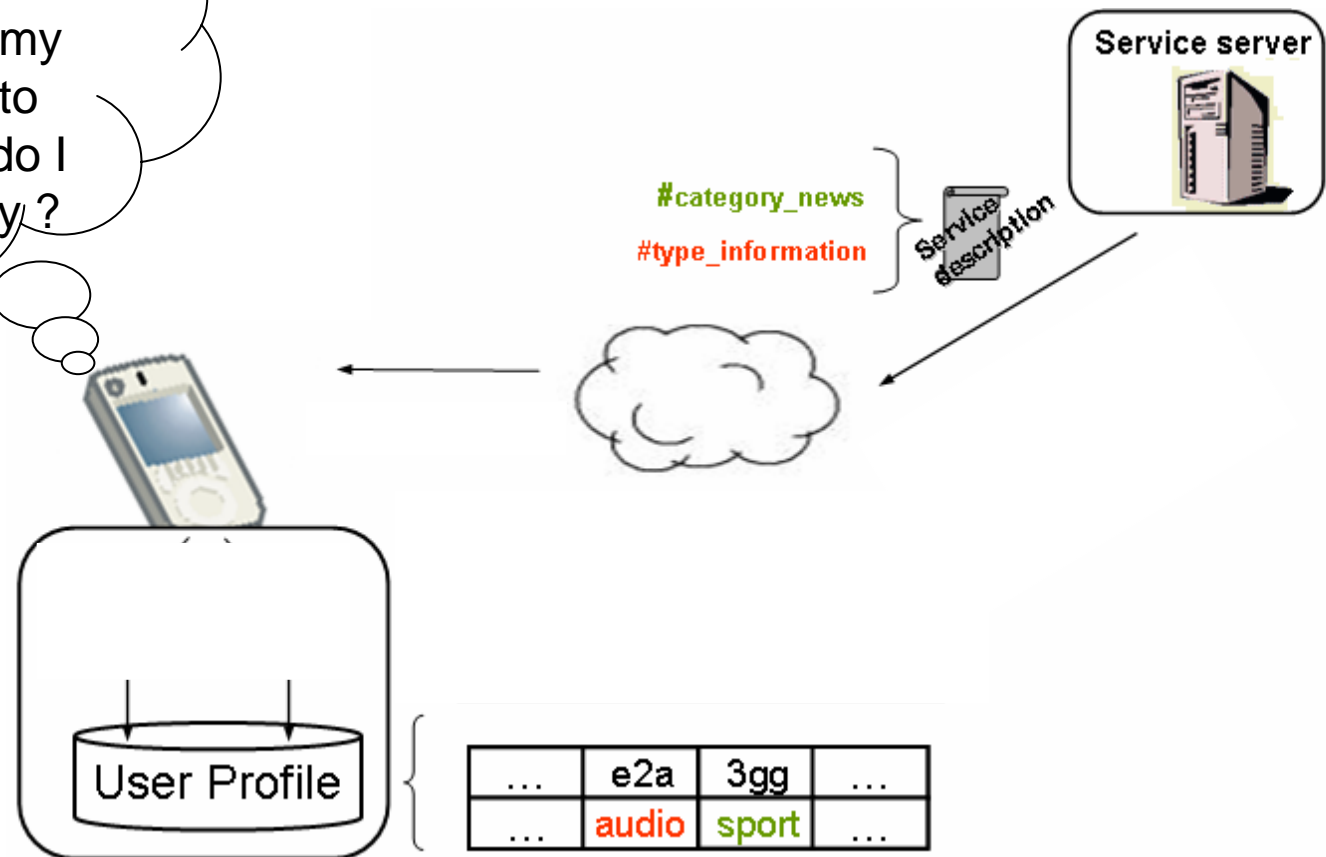


# Personalizing services using views

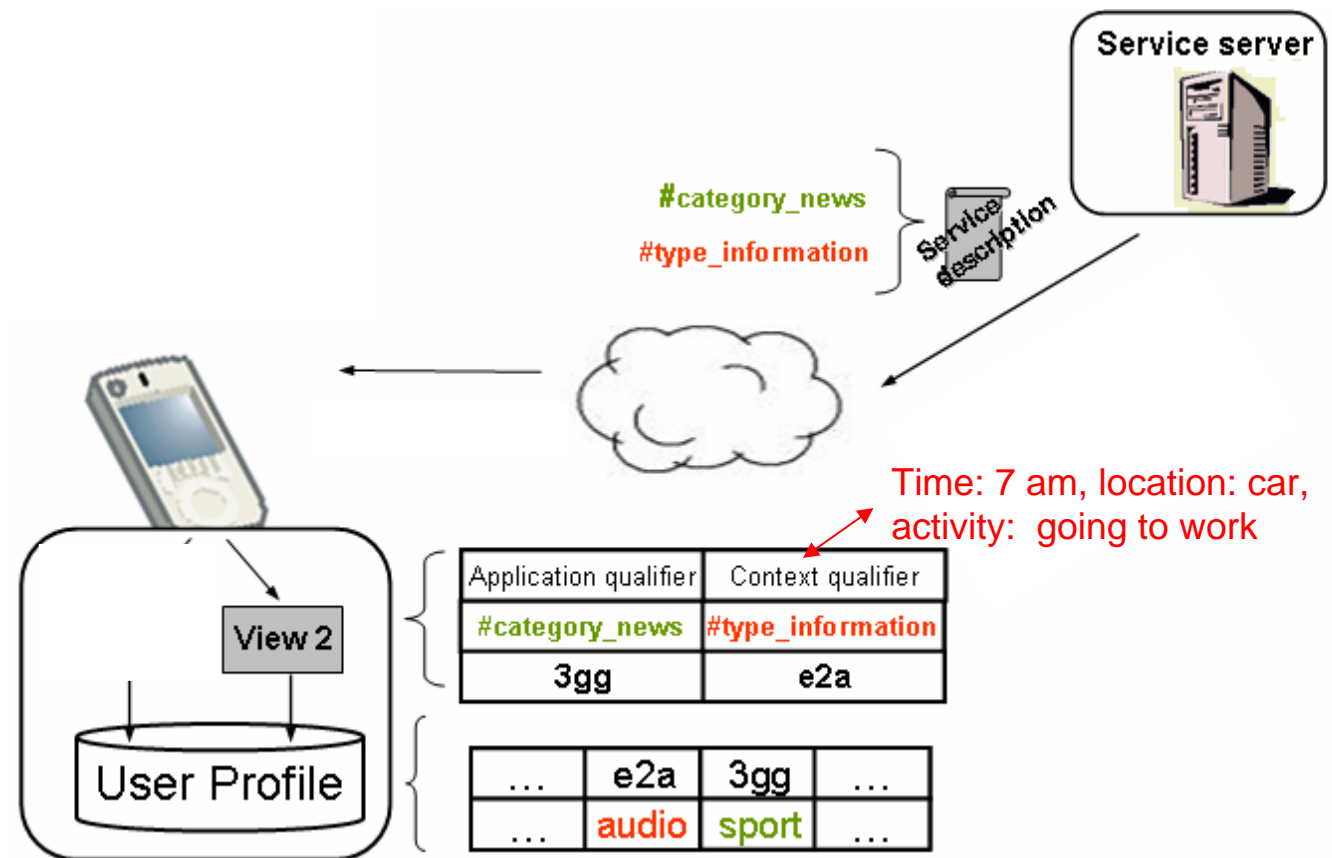


# Personalizing services using views

It's 7 am, I am currently in my car, going to work, what do I need exactly?

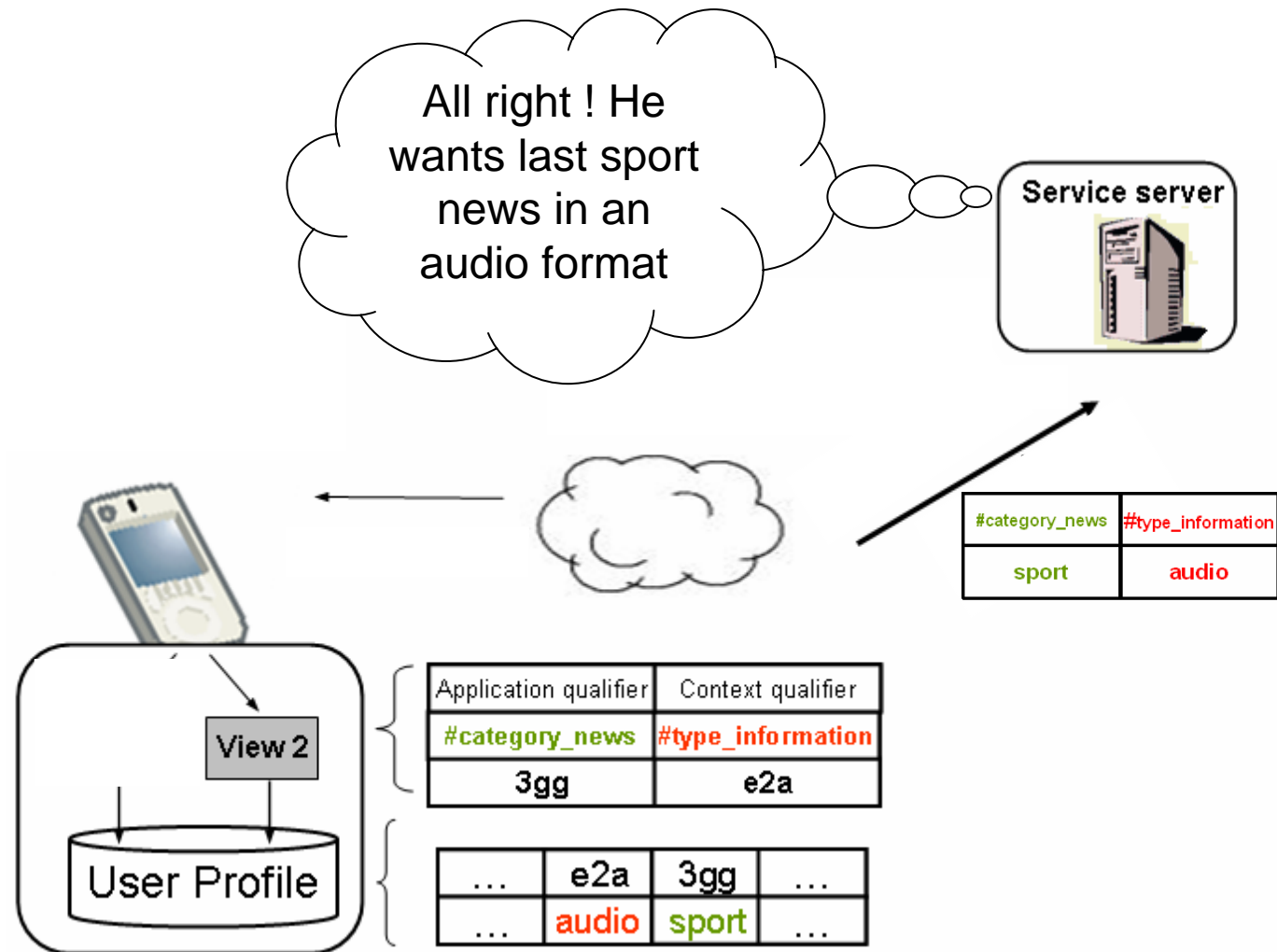


# Personalizing services using views

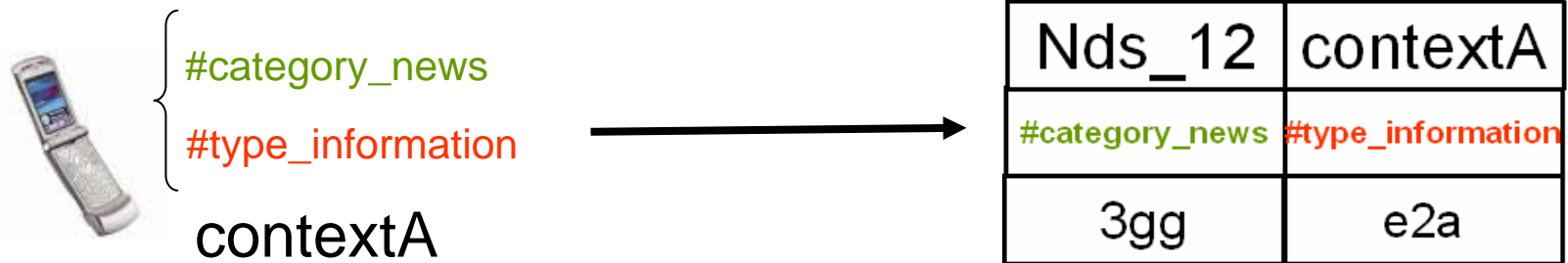




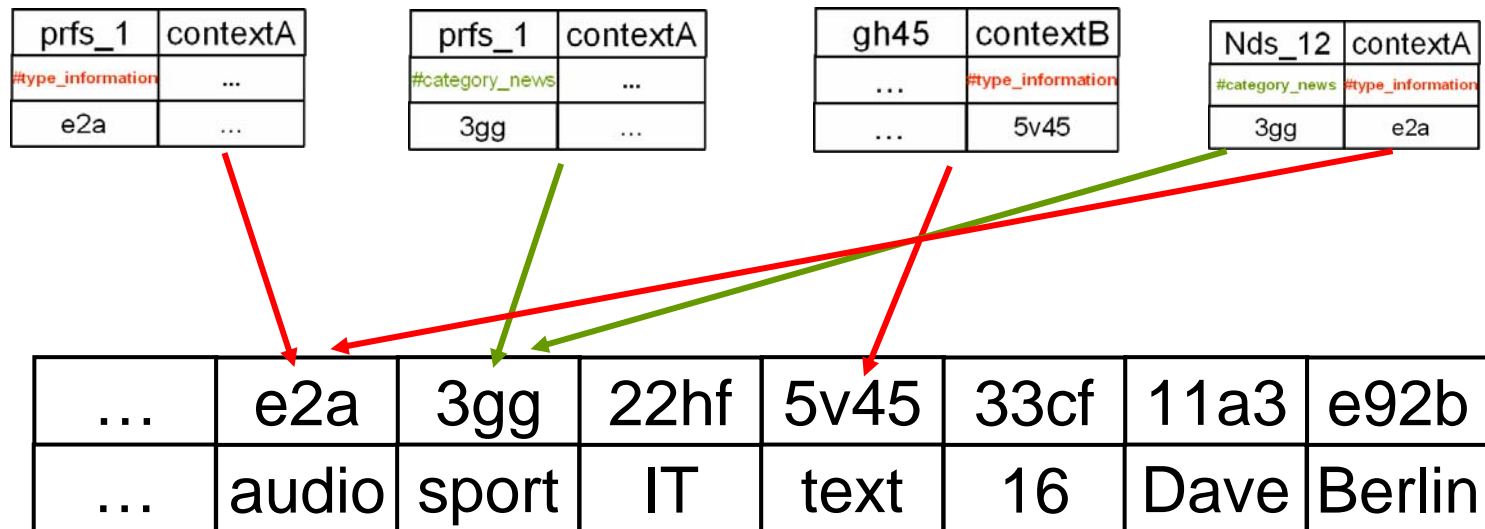
# Personalizing services using views



# Creating a view

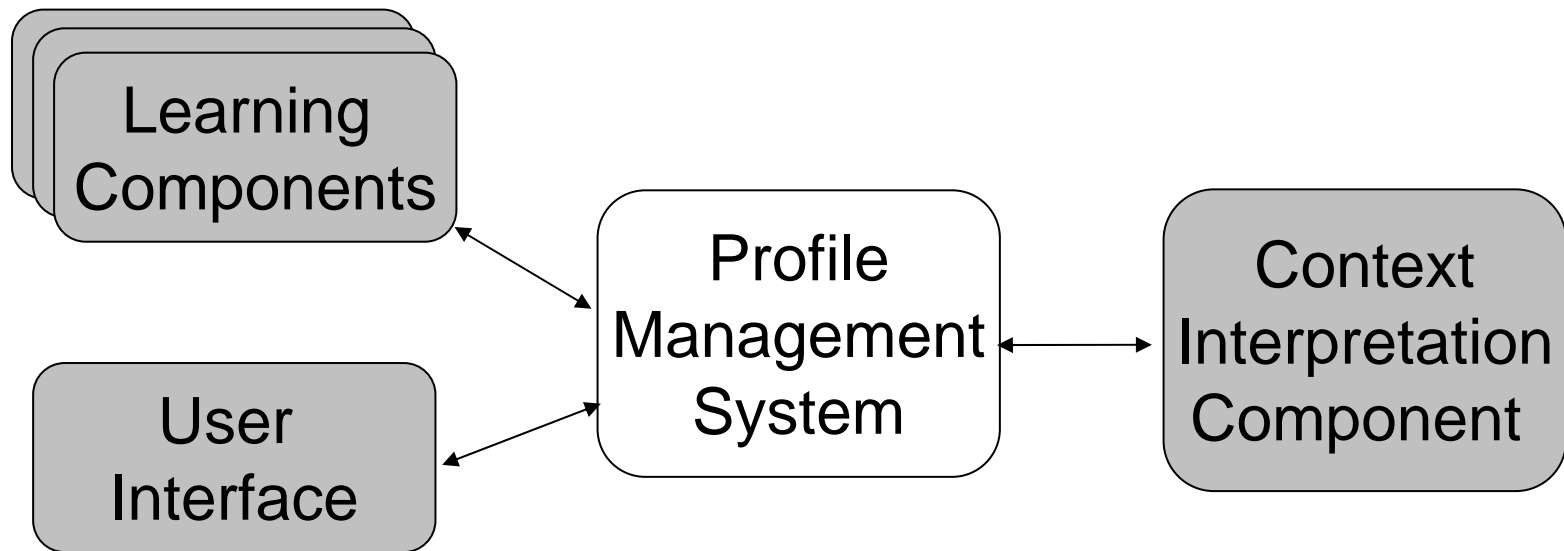


- Comparing context
- Comparing semantic



# Framework for service personalization

- **Service personalization enabled by a framework**
  - Including the Profile Management System

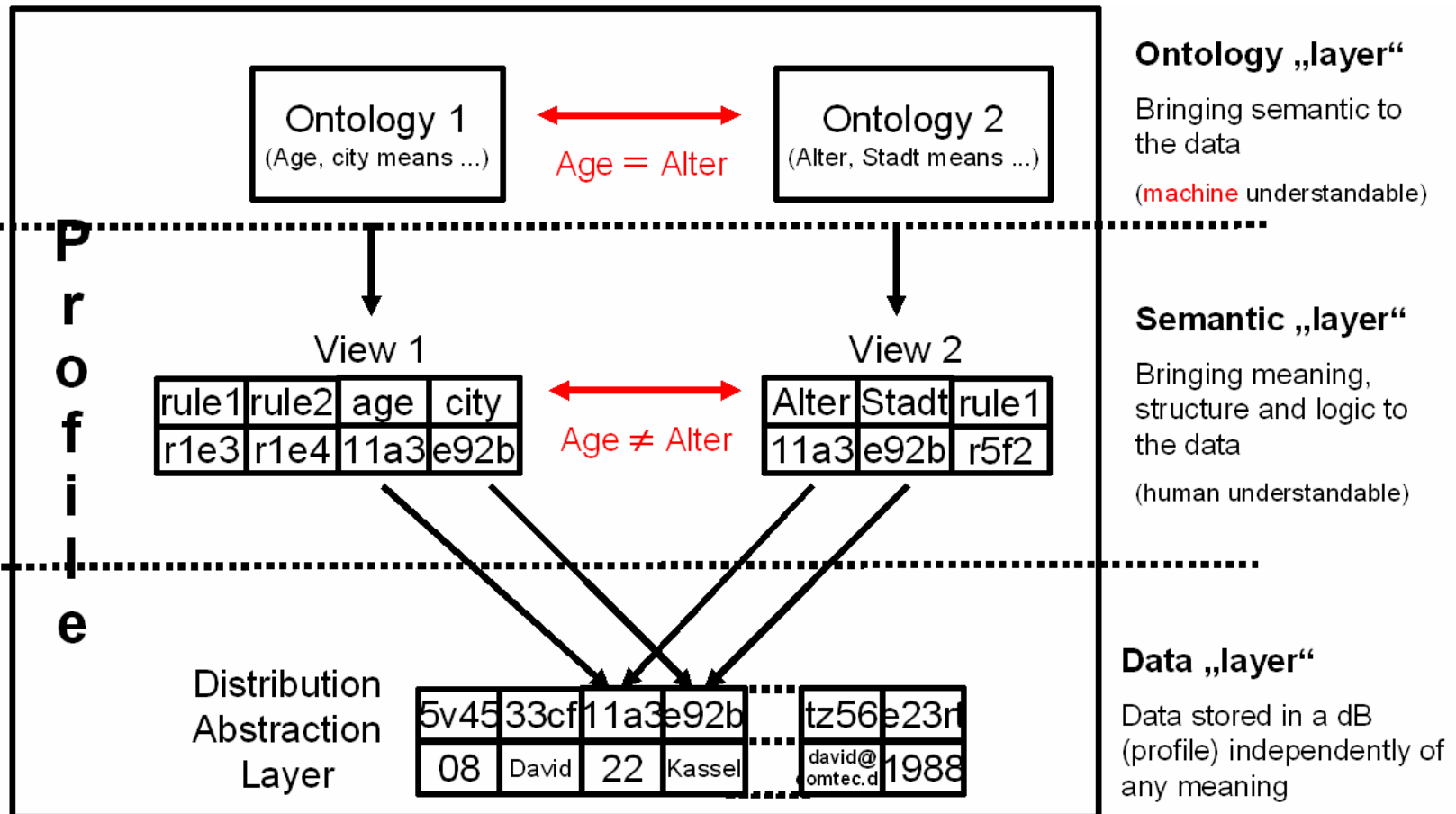


# Implementation and further work

- **Implemented in Java J2ME**
- **On iPAQ**
- **Further work targets**
  - **Ontology mapping**
  - **Context mapping**



# Views to separate meaning and value



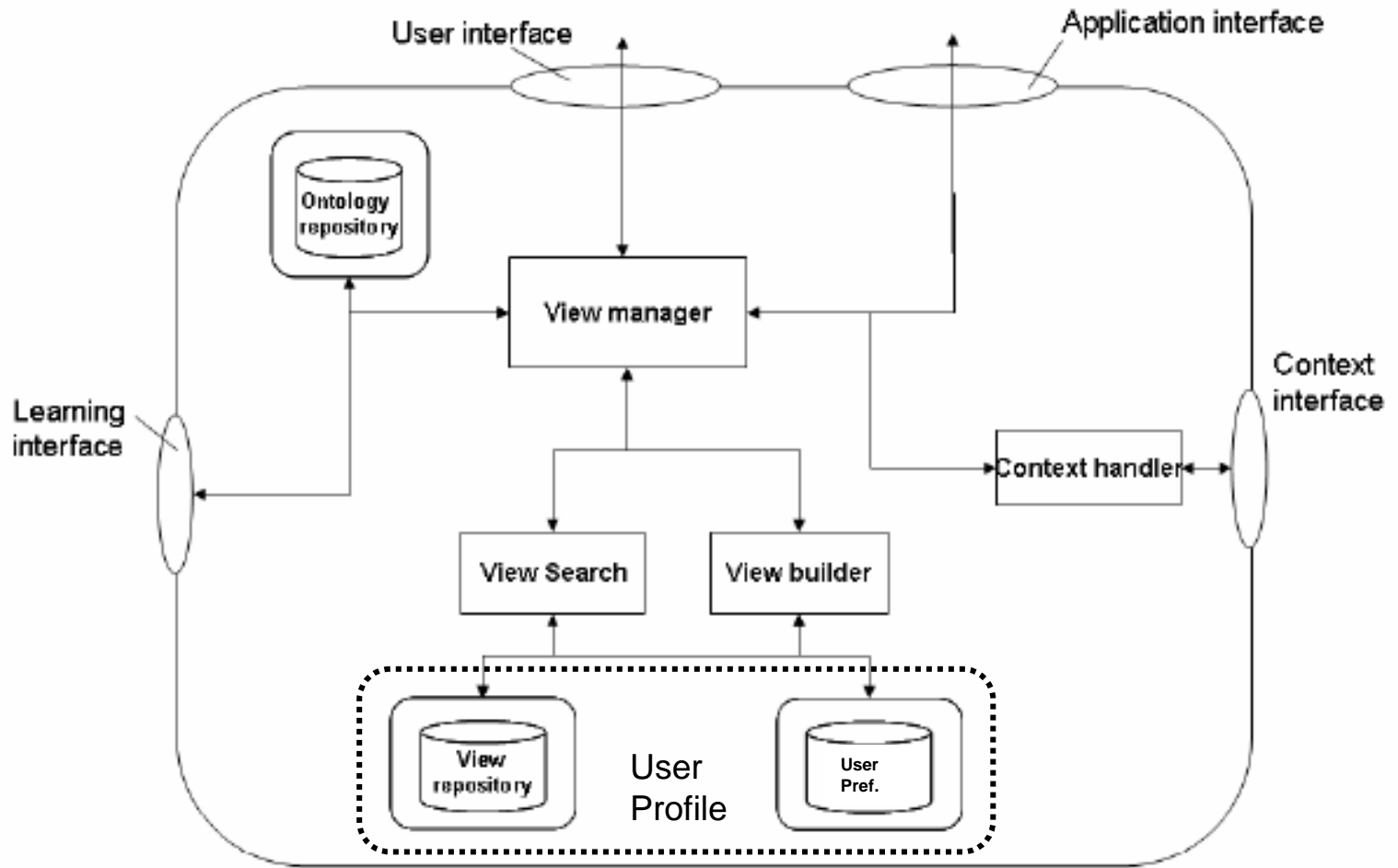
# Conclusion

- **Profile Management System for personalizing services**
  - Storage of user preferences
- **Requirements for profile management systems:**
  - Avoiding storage of redundant data
  - Providing different services
    - with context-dependent user preferences
- **Our Approach:**
  - Common profile management system
    - using views to structure the profile
- **Views enable**
  - the avoidance of redundant data storage
    - through separation of meaning and value of data
  - the retrieval context-relevant preferences

# Questions ?

[coutand@uni-kassel.de](mailto:coutand@uni-kassel.de)

# Architecture





# Example of CC/PP Profile

```

<?xml version="1.0"?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:ccpp="http://www.w3.org/2002/11/08-ccpp-schema#"
  xmlns:ex="http://www.example.com/schema#">

  <rdf:Description
    rdf:about="http://www.example.com/profile#MyProfile">

    <ccpp:component>
      <rdf:Description
        rdf:about="http://www.example.com/profile#TerminalHardware">
        <rdf:type
          rdf:resource="http://www.example.com/schema#HardwarePlatform" />
        <ex:displaywidth>320</ex:displaywidth>
        <ex:displayHeight>200</ex:displayHeight>
        </rdf:Description>
      </ccpp:component>

      <ccpp:component>
        <rdf:Description
          rdf:about="http://www.example.com/profile#TerminalSoftware">
          <rdf:type
            rdf:resource="http://www.example.com/schema#SoftwarePlatform" />
          <ex:name>EPOC</ex:name>
          <ex:version>2.0</ex:version>
          <ex:vendor>Symbian</ex:vendor>
          </rdf:Description>
        </ccpp:component>

      <ccpp:component>
        <rdf:Description
          rdf:about="http://www.example.com/profile#TerminalBrowser">
          <rdf:type
            rdf:resource="http://www.example.com/schema#BrowserUA" />
          <ex:name>Mozilla</ex:name>
          <ex:version>5.0</ex:version>
          <ex:vendor>Symbian</ex:vendor>
          <ex:htmlVersionsSupported>
            <rdf:Bag>
              <rdf:li>3.2</rdf:li>
              <rdf:li>4.0</rdf:li>
            </rdf:Bag>
          </ex:htmlVersionsSupported>
          </rdf:Description>
        </ccpp:component>

    </rdf:Description>
  </rdf:RDF>

```

# Example of GUP Profile

```
<Profile ...>
<user:User>
<user:Identity>
<user:FirstName>Enrico</user:FirstName>
<user:LastName>Rukzio</user:LastName>
</user:Identity>
<user:Contact>
<user:Email>Enrico.Rukio@ifi.lmu.de</user:Email>
<user:Homepage>http://www.mimuc.de</user:Homepage>
<user:TelephoneWork>+49 89 2180-4656</user:TelephoneWork>
</user:Contact>
</user:User>
<device:Device>
<device:HardwarePlatform>
<device:ScreenSize>101x80</device:ScreenSize>
<device:Model>T68R1</device:Model>
<device:ImageCapable>true</device:ImageCapable>
<device:Keyboard>PhoneKeypad</device:Keyboard>
<device:Vendor>Ericsson Mobile </device:Vendor>
</device:HardwarePlatform>
...
</device:Device>
....
</Profile>
```