



MAGNET

My personal Adaptive Global NET

Scenario construction and personalization of PN services based on user profiles and context information

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About MAGNET Beyond

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Outline

- Introduction
- Constructing scenarios and use cases
- User profiles, context and policies
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 - Conceptual structure of user profiles
 - Common management framework
- Personalization of services in MAGNET Beyond
- Conclusion and future work

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Cases in MAGNET Beyond

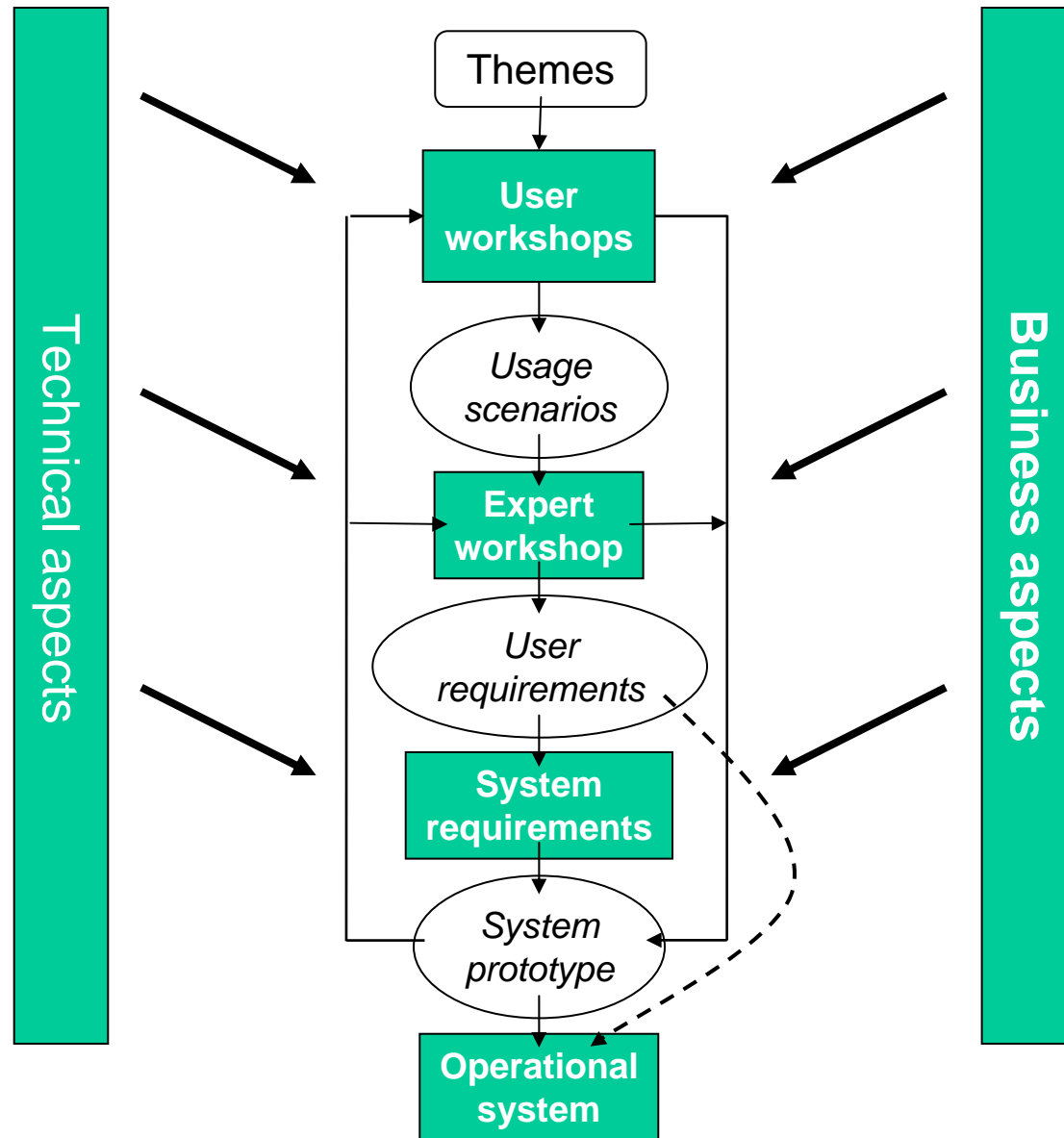
- **Nomadic@work**
 - Technical support for the professional sector
 - Nomadic users with high demands on security and bandwidth and strongly varying environments / working conditions
 - Focus on context management, personalization, security, mobility ...
 - Potential need for high data rates
- **MAGNET.Care**
 - Technical support to handle health care related issues more efficiently than today
 - Focus on personalization, mobility, usability, security ...
 - Lower data rates, sensors

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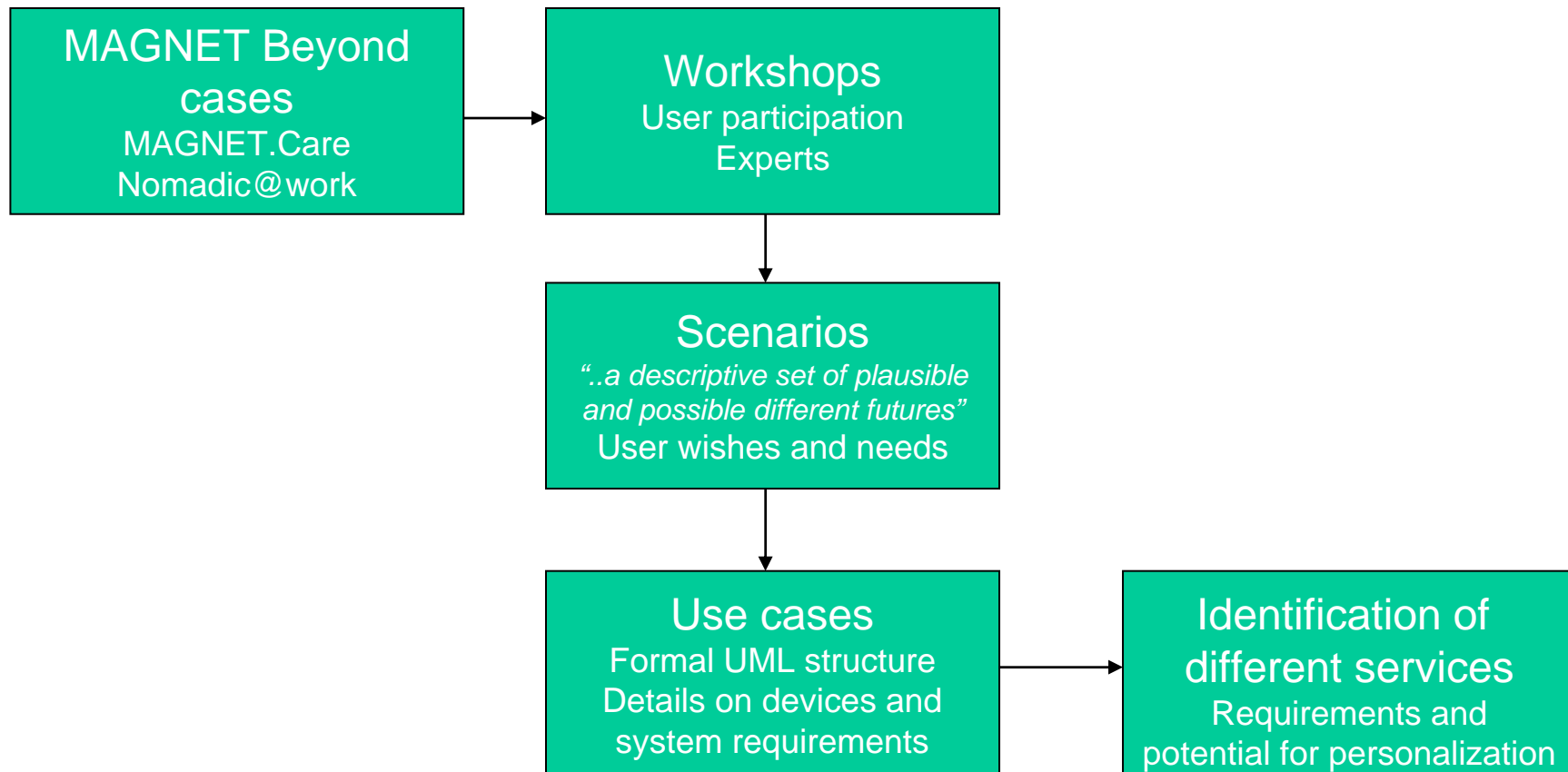
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The user-centric process in MAGNET Beyond



The link between scenarios and services



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User profiles and context

Overall objectives of this work are:

- to develop a **conceptual structure of user profiles**
- to achieve a flexible structure that can adapt services to the user's preferences **in a given context**
- to combine user profiles, context information, security and privacy in a common management framework to **maximize the value of PN services** for the end users
- to enable **personalized, context-aware services**

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Key initiatives and standards

- 3GPP GUP (Generic User Profile) and IMS integration
- Liberty Alliance (identity management and trust)
- IETF Rich Presence
- Device profiles: CC/PP, UAProf (W3C, OMA)
- Policy initiatives (e.g. Rei)
- W3C P3P (Platform for Privacy Preferences)
- MPEG-7, MPEG-21 (user description and media formats)
- OWL ontology architecture (XML/RDF)

Challenge:

How to manage such frameworks in a decentralized PN architecture?

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User meets environment ...

- User profile information
 - Description of the user
 - Role of the user
 - User preferences
- Context information
 - Time, place, persons, devices, available networks and network status, ...
 - Local and remote context
- How to select the relevant parts for processing and adaptation of the service?

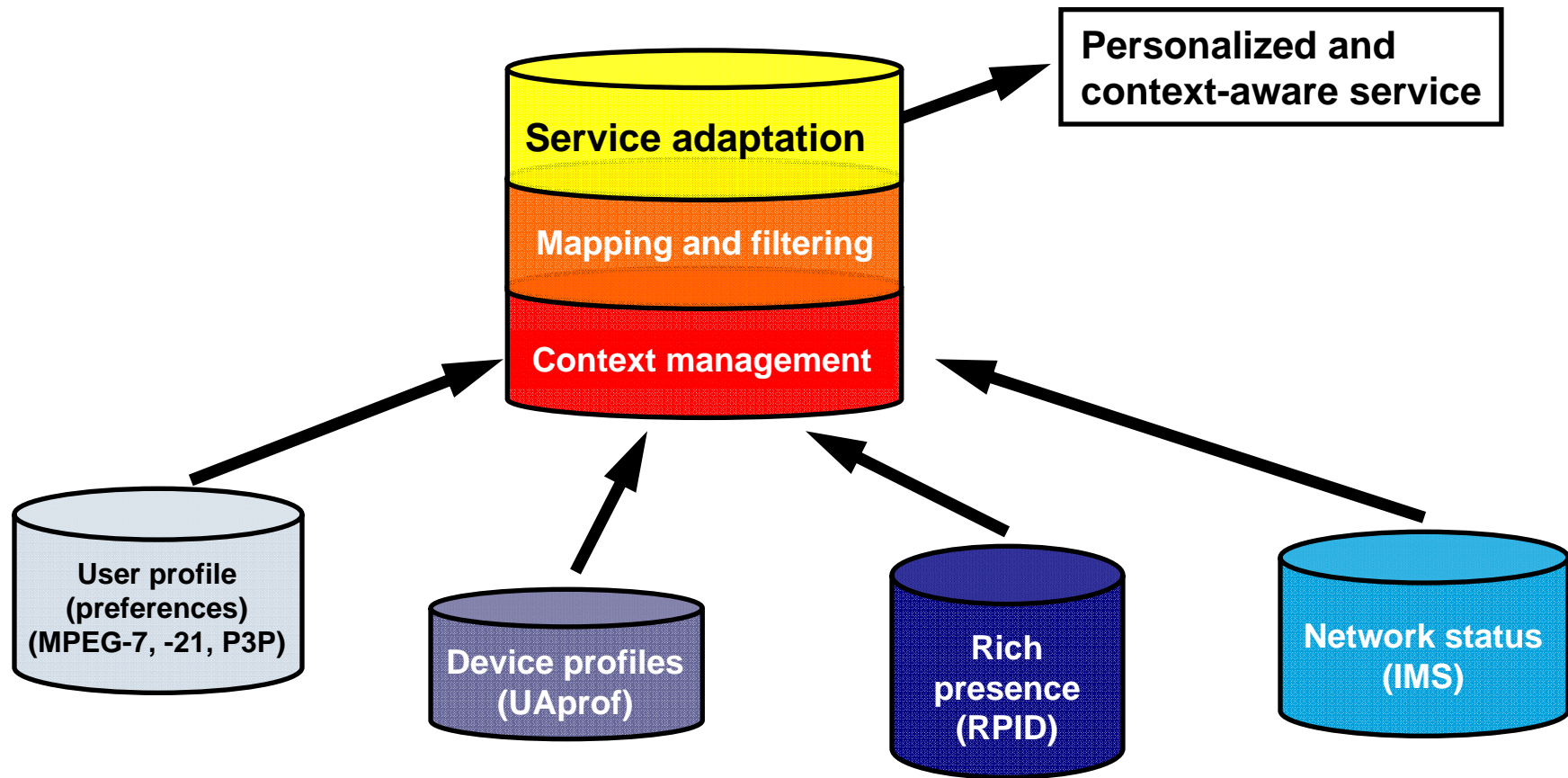
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Service adaptation (high level)



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Elements of the user profile

- Description and facts about the user
 - age, gender, name, address, phone number, birth place, nationality, education, history, ...
- Generic user preferences
 - preferred settings, interests and dislikes, hobbies, ...
- Common roles of the user
 - at work, at home, travelling
- Context-specific user preferences
 - when I am in this environment, I would like ...
- Application-specific preferences
- Security and privacy preferences

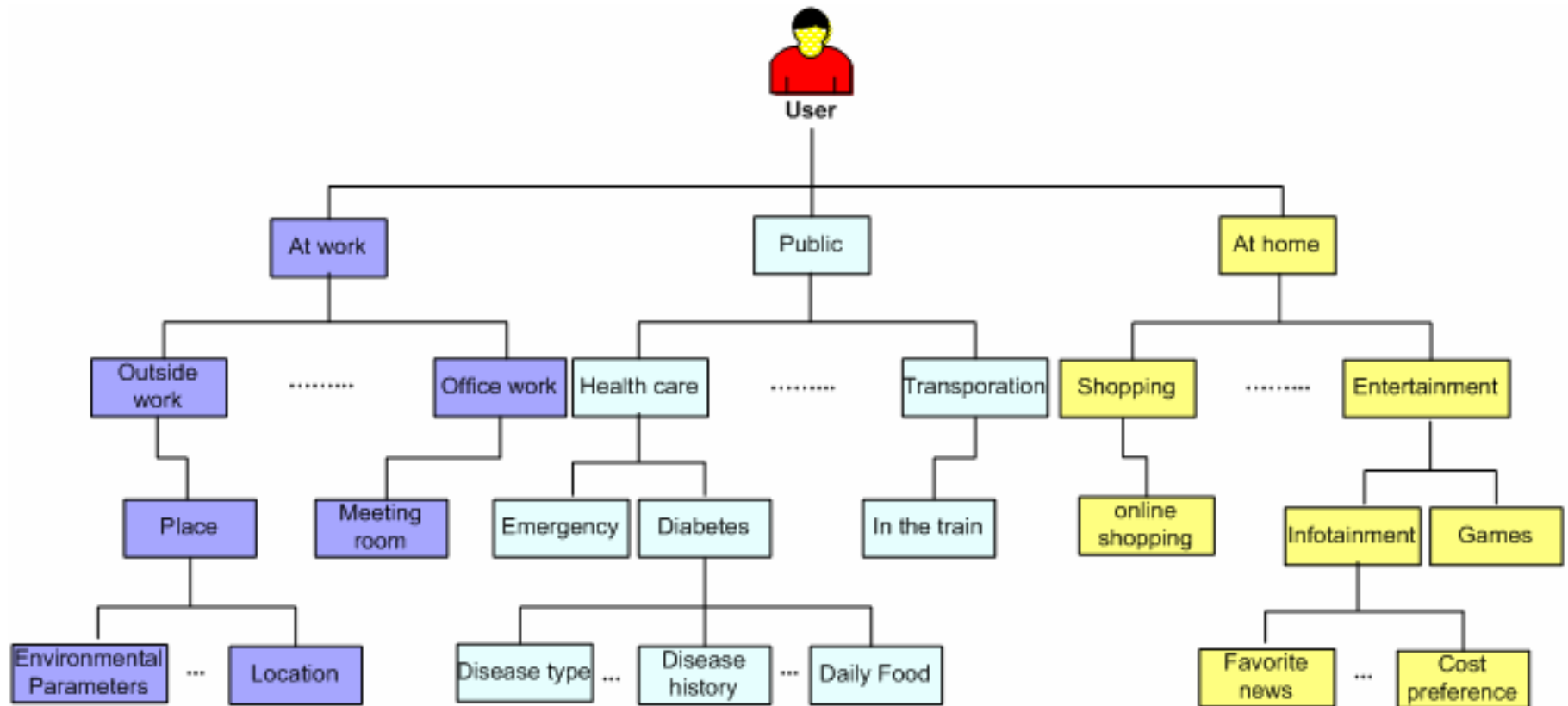
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Role-based profile structure



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Where to store the user profile?

- The user must remain in full control of the profile
- The profile must always be available and open for updates from the user
--> A local version must be on the client's device(s)
- Access control is needed to protect the user's privacy
- The amount of personal information provided to external entities must be kept at a minimum
 - The user may even be anonymous or “in a crowd” of similar users (W3 P3P)
- --> User profiles must be protected by policies
- The PN has access to more information than the individual user
 - Queries and subscriptions to external sources
 - Collaborative filtering - what other users are doing/have done (Amazon)
- --> A “network” version of the user profile can add value and intelligence

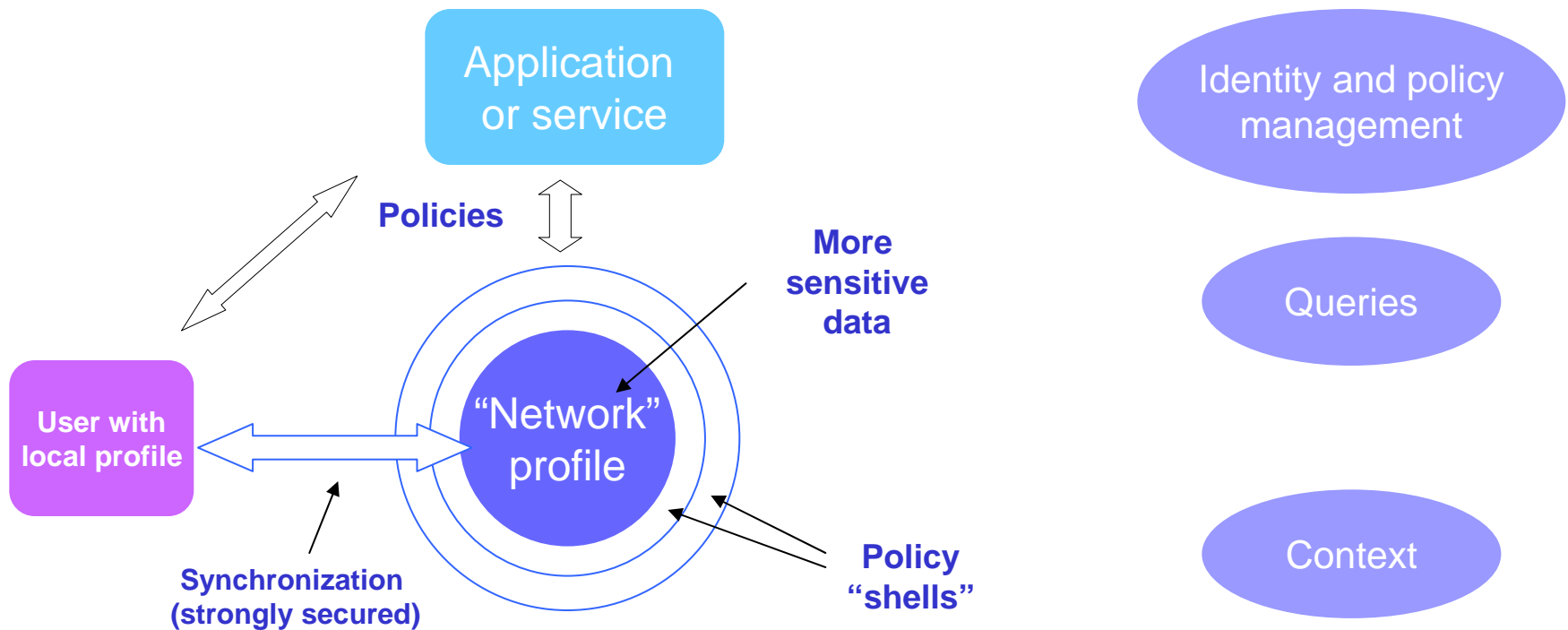
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User profile and policies



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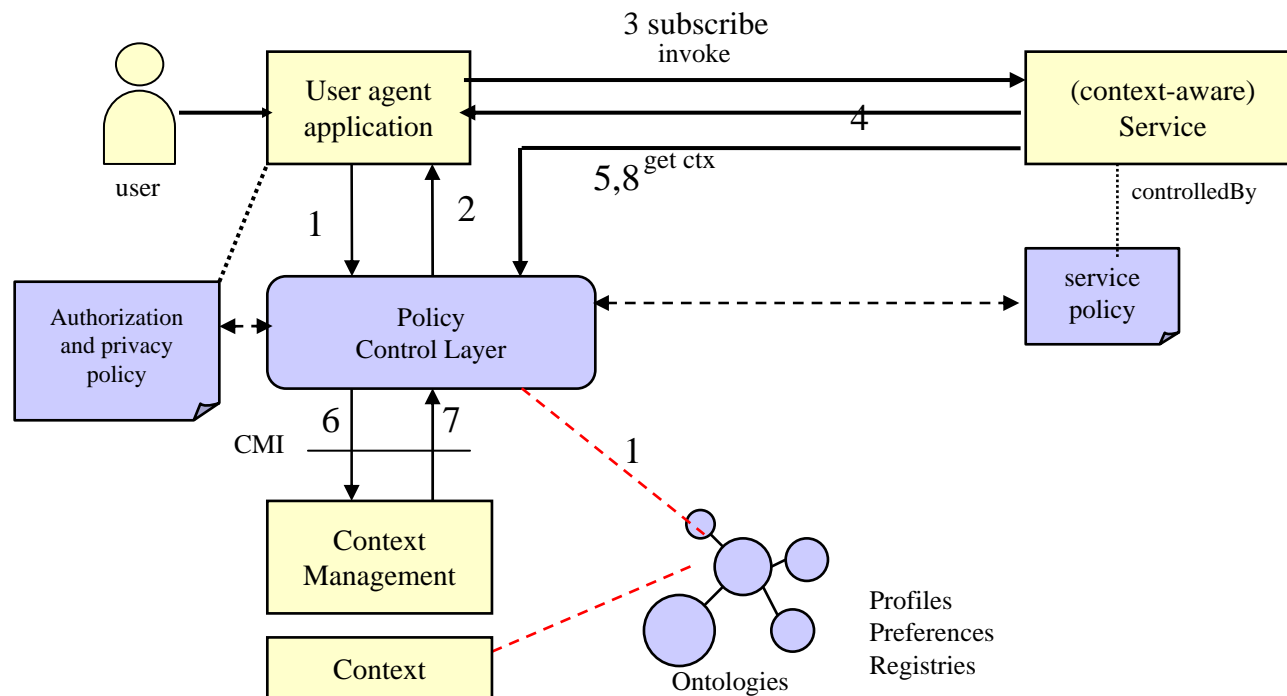
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Context-aware service architecture



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Nomadic@Work: Selection of use cases

5 primary use cases

- Personal travel service
- Personal guide
- Temporary office
- Mobile office
- Digital business cards

Screening criteria:

- Realistic and relevant for users
- Potential for personalization
- Context awareness
- Security, trust and privacy issues
- Novelty (not just 3G/web)
- Sharing/borrowing resources from other users
- Service mobility/transfer
- PN federations involved

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Adaptation of services

- Detailed analysis of use cases
- 3 tier structure
 - Data processing: user profile and context information
 - Application logic: management framework
 - Presentation
- Building on existing standards from 3G and WWW
 - and extending them to a decentralized PN
- Providing access control and policy management
- Special focus on peer-to-peer and PN federations

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Conclusions and future work

- A common management framework can offer significant value for the future users of PN services
- To realize the full potential of the PN service architecture it is essential to
 - consider realistic use cases
 - demonstrate the value of personalization and context awareness of services
 - pave the way for new business opportunities
 - interface smoothly to existing 3G and web services
- Ongoing work:
 - Detailed analysis of use cases
 - Development of a common management framework for user profiles and context
 - Data representation and ontologies for user profiles and context
 - Very fruitful interaction between user-oriented and technical approaches

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The balance: Privacy versus utility



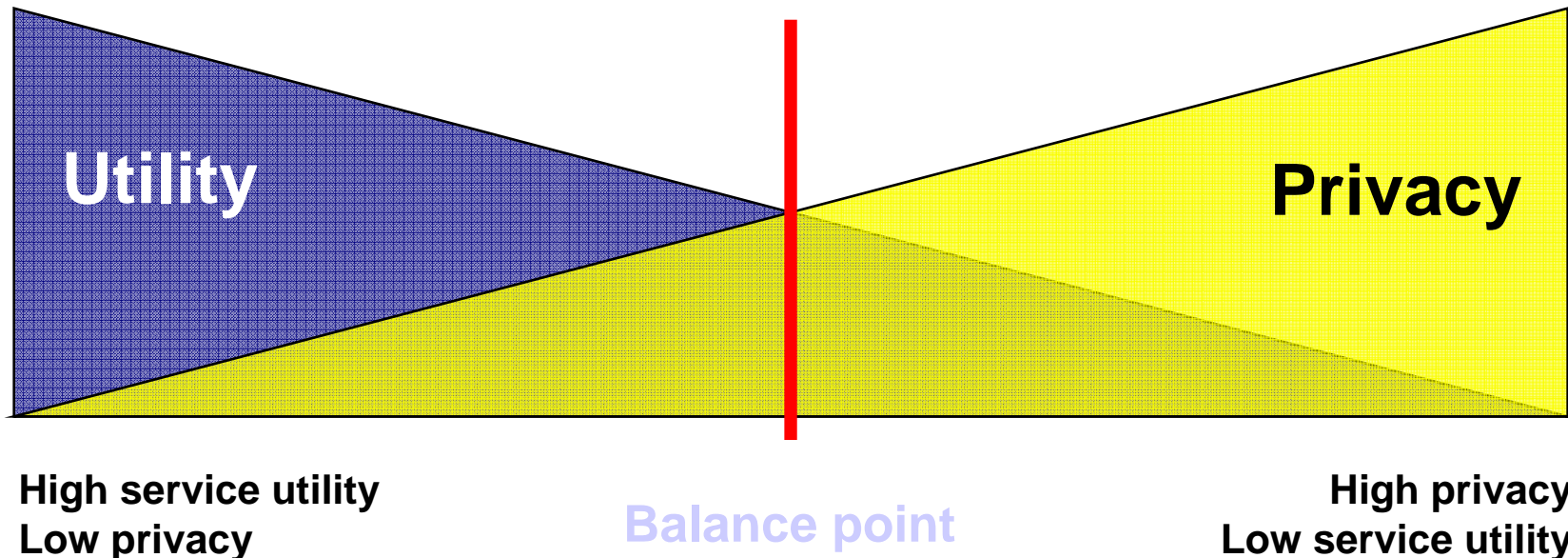
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Service provider

- Better service utility requires more personal information from the user
- May charge more for higher privacy

User

- Highest possible service utility
- As much privacy as possible
- Cheap service



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P3P

- P3P (Platform for Privacy Preferences) is a W3C proposal for controlling the use of personal information on websites
- P3P provides a standard XML format that web sites use to encode their privacy policies
- Sites also provide XML “policy reference files” to indicate which policy applies to which part of the site
- No special server software required
- User software to read P3P policies is called a “P3P user agent”

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P3P online privacy issues

- Data being tracked:
 - Who is collecting the data?
 - Exactly what information is being collected?
 - For what purposes?
 - Which information is being shared with others?
 - And who are these data recipients?
- Internal privacy policies
 - Can users make changes in how their data is used?
 - How are disputes resolved?
 - What is the policy for retaining data?
 - And finally, where can the detailed policies be found in “human readable” form?

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Policy examples

Personal travel service:

- the user makes a subscription to the travel service, exchange of policies, payment means, contact info. The travel booking is based on the subscription.
- The user handles each trip individually, there is a user policy and a service policy (credit card privacy, contact privacy...)
- Ticket to the mobile: authorization
- Service policy to track the user at the airport and send him messages
- Service search based on presence activity (travel) and location

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Important considerations

- Build on existing standards or initiatives
- Provide flexibility (XML, XSLT, XPath, ...?)
- Role-based (what is the user doing right now?) and rule-based (policies)
- How “standardized” do we want to assume the daily life of users to be?
- Local vs. distributed control?
- What can be done / should be possible in a P2P situation (communication between local user profiles based on rules and policies)?

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Intelligence?

- A network entity (profile manager / personalization provider / identity provider) can gather information on usage patterns, history, etc. and learn about the user's behaviour over time
- Technologies: data mining, collaborative filtering, ...
- This can be used to improve usability and provide intelligent suggestions to the user (like Amazon.com)
- This would be a 2nd step and would not have to affect the management architecture

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