

SPECTER

A User-Centered View on Ubiquitous Computing

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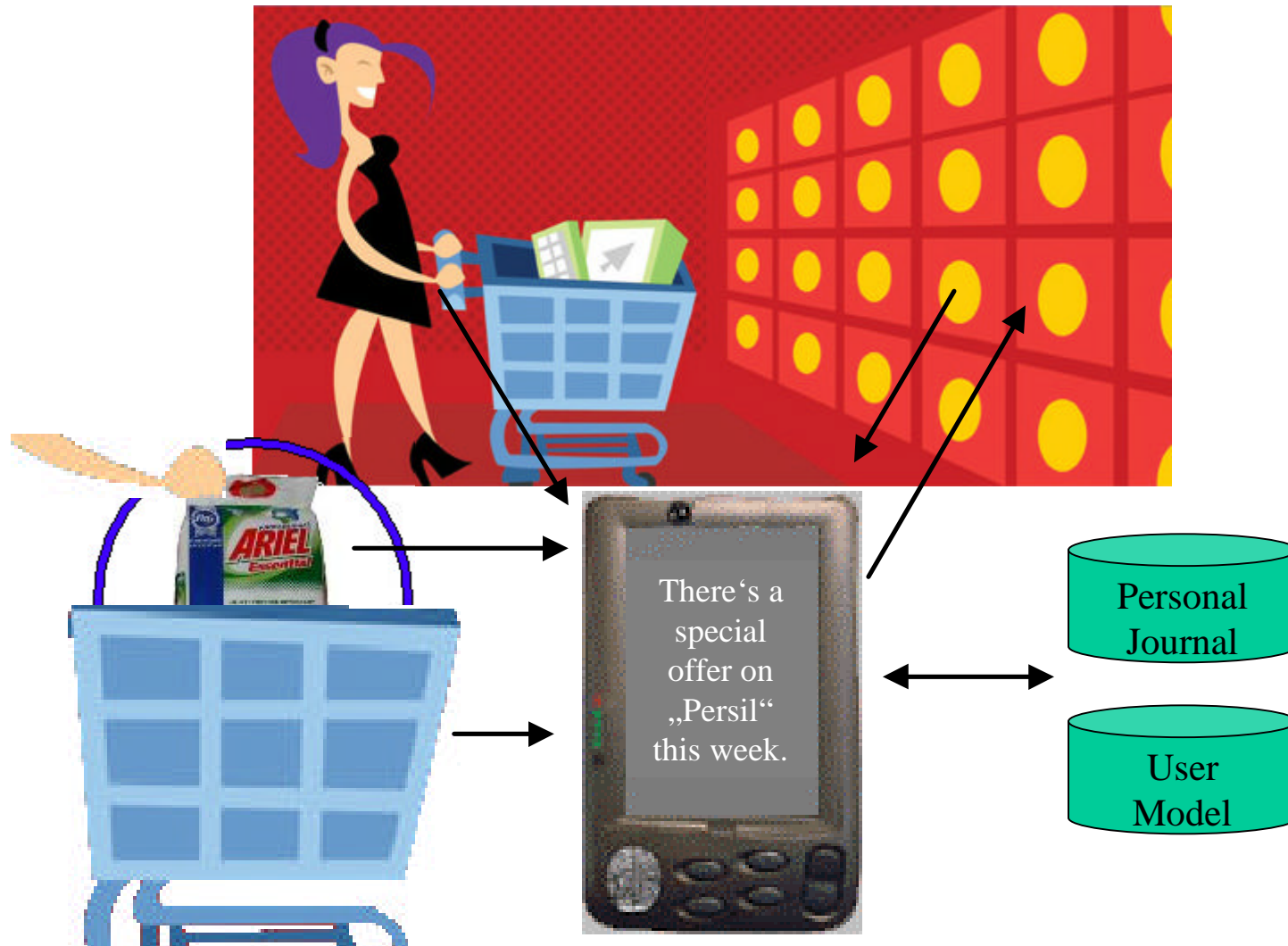
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Outline of this talk

- Sample scenario
- The Personal Journal
- World Knowledge
- User Model
- Learning

Sample scenario: *A Shopping Tour*



Sample scenario - Components

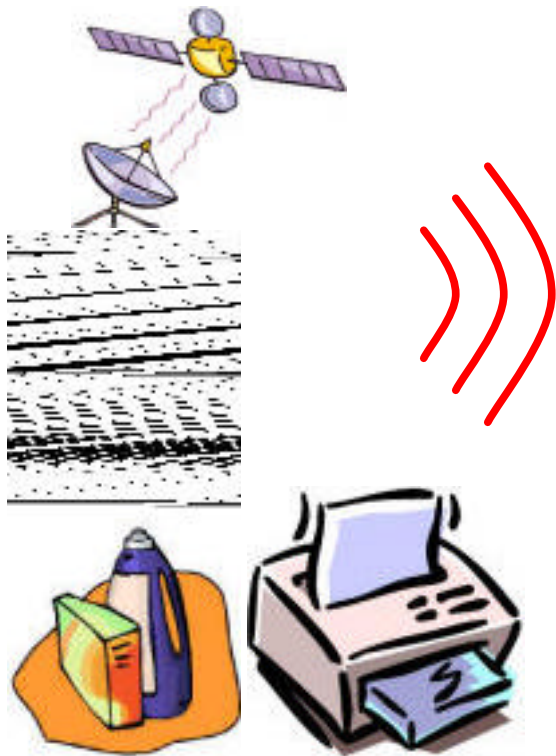
- User Interface
 - PDA, Cell Phone
- Sensors
 - Environment
 - Smart Objects (shopping cart, product)
 - LBS (detergent area, special offers)
 - User
 - Biosensors (heart rate, pupil diameter)
- Knowledge bases
 - Personal Journal, User Model

Personal Journal

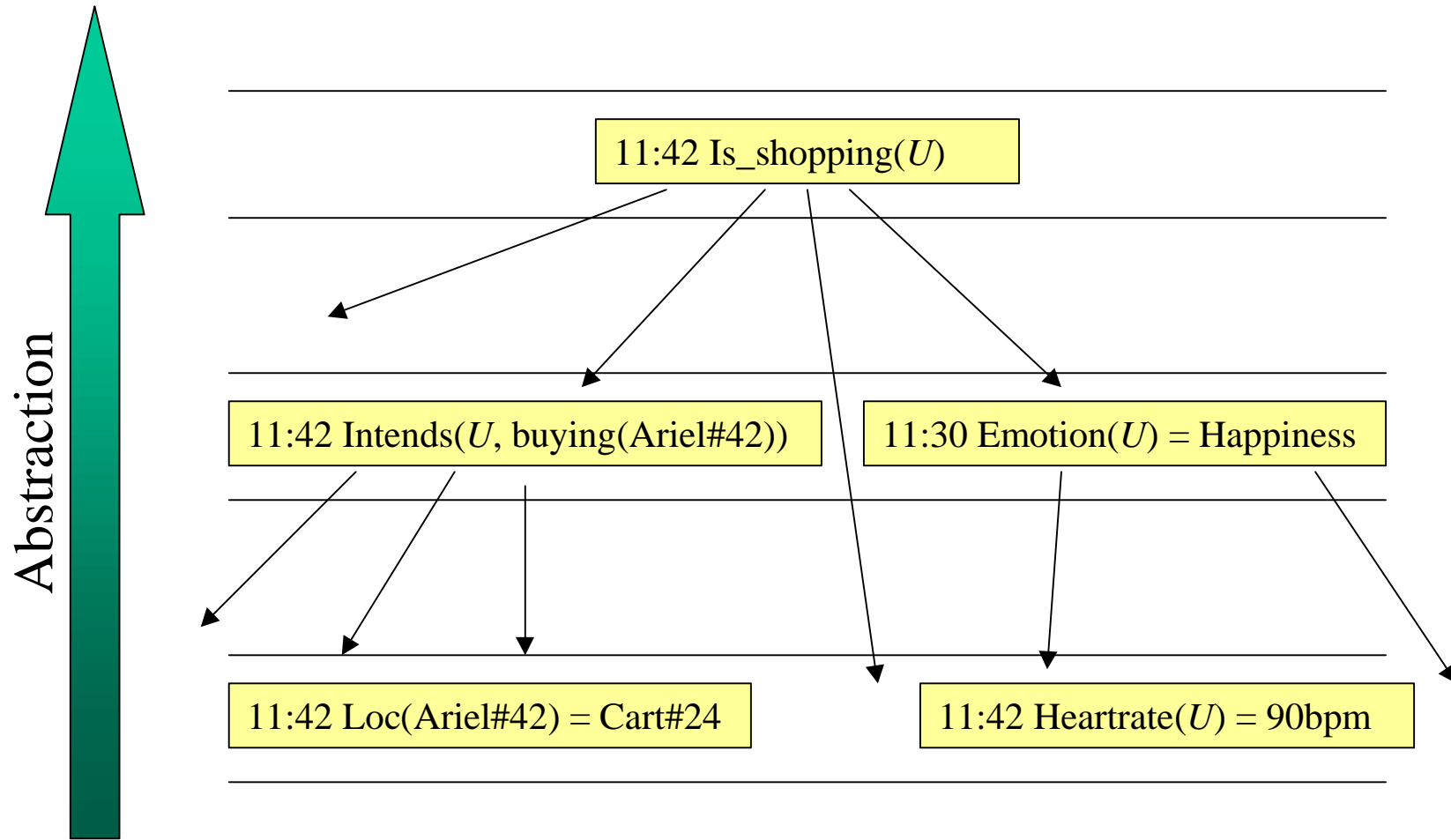
- History of past events
 - User's / SPECTER's (inter-)actions
 - U's environments
- *U* can query the PJ
 - „When was the last time I bought *Ariel*?“
- *S* can use the PJ to behave proactively
 - „There's a special offer on *Persil* today!“
- Where do the contents of the PJ come from?
 - Storage of sensor data
 - Explicit user input

What to include in the PJ?

- Let U decide
 - Cumbersome, if feasible at all
- All low-level sensor input
 - Huge amount of data
 - Hard to process
- Omit unimportant data
 - How to rate importance?
- „Higher“ level abstraction
 - What if original data is needed at a later time?



Layers in the Personal Journal



World Knowledge

- General knowledge
 - *Ariel* is a detergent
 - If a person intends to buy a product she puts it into her cart
- Events and actions
 - *U* puts *Ariel* into her cart
 - *U* feels happy
- Inference
 - *U* intends to buy *Ariel*

User Model

- Helps resolving ambiguous interpretation of sensor data
 - e.g. Shopper / Security Guard
 - Multiple views of the model
- ← Sensor data help activation of the correct view
 - Views relate to the different roles each person portrays in everyday life
 - Filters on SPECTER's actions
 - Present a simple form of adaptivity

Views and Privacy

- Already the use of a system can give away information about the user (model)
 - „There’s a popular bar around the corner.“
- S must base its actions on the current active view
- U can control which view is active
- „Mask views“
 - Intentionally activate an apparently inappropriate view
 - Good alternative to having U decide about which data is stored in the PJ

Learning

- On the basis of PJ entries
 - $\text{Buys}(U, \text{Ariel}) + \text{Happy}(U) \Rightarrow \text{Likes}(U, \text{Buying}(\text{Ariel}))$
- U's goals
 - Prerequisite for active behavior of S
 - „Query for special offers on detergents“
- Activation of views in the UM

Summary

