

Evaluation Working Group

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What's difference for Ubiquitous computing?

- What is transparent?
- Implications of transparency
- Living with system – critical mass needed?
- Failure recovery/graceful degradation
- Evolvability
- Scalability
- Garbage collection at many levels
- Cost – not just dollars, but computational resources, battery power, bandwidth, devices, infrastructure needed

Questions/Level

Level	Questions
User/Group	Useful, Usable, Interesting/fun Appropriate action taken Predictability/mental model, Forgiving
Task	Desired action occurs when context is matched
Services	Correct decomposition for services, communications, reliability, Latency in service discovery
OS/Networking	Bandwidth constraints, connectivity, performance
Physical Devices/Comms	Interference between devices, Resource scheduling , usability of device

Example: Personal Digital Secretary

Step 1: observation, interviews with really good assistants

Step 2. What can system control? – lighting adjustments

Step 2.5 WOZ – for a day, techniques to assess usefulness

Different levels of WOZ

Step 3.0 Highest risk problem – can we learn rules?

build a database (WOZ)

Step 3.5 algorithms – evaluate against training set

Sensor database needed to use in refining algorithms

Publish paper at this point

Step 4.0 Prototype – hack up system, sensors, actuators, video of users

Set a time limit here for usage

Step 4.5 Whole infrastructure integrated

Performance aspect


Scalability – used for 30 people in 30 rooms

Evolvability - add different functionality

User-centered evaluations

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Evaluation of context

- Discover appropriate context for app
- Capturing context – appropriate, correct
- Matching context
- Inferencing/learning
- Carrying out appropriate action given the context

Conclusions

- **System evaluation needed as well as user evaluation**
 - **Application and infrastructure evaluations are both needed**
- **What are tools, methodologies to help speed up expensive steps?**
- **Evaluation for ubiquitous computing is a research topic in its own right**