Why Ubicomp in the Home

• Automating/replacing common chores/ reducing complexity
• Empowering us to do more difficult things
• Enriching social lives, fostering local community
• Blur between work/entertainment/home

• Human capabilities aren’t changing that quickly
Properties/Requirements

- Reliability/dependability
- Maintainability
- Individualization
  - Automatic adaptation vs. customization
  - Profiles
- Predictability
- Affordances/transparency
- Observability and mental model
- Recoverability
- Simplicity – will people get smarter
- Training wheel/scaffolding for frequently used appliances
- Interoperability
Applications

• Capture of experiences:
  – Reminder services/lost objects/how-tos/share info
• Personal communications/keep in touch
• Cleaning robots
• Home automation and entertainment – coming soon
• Information filtering: in and out
• Looking after pets while you’re away
• Looking after kids from a remote location
• Remote control, energy management
• Improved security/safety
Applications cont’d.

- Store keeping
- More awareness of consumables
- Home a/v integration
- Home diagnostics/health care
- Electronic butler: where are my favorite socks?
- Locator services
- Shopping list reminders
- Food tests – alarms when things go bad
  - Allergies, too spicy
Past Experiences

• Video on Demand failure
• Home theater success
• Games and interactive toys success
• Personal video recorders success
Limitations

- Storage doubling every year
- Processor speed every 18 months
- Network bandwidth increasing more slowly
- Battery power much more slowly
- Ability to create high-quality, usable, reliable software not increasing
- Human capacity ????
Impediments

• Need for additional technology not seen as contributing to better life
• Cost
• Technical feasibility
• Still too complex – do we need home system administrators
• Privacy and security concerns
• Recording everything will fundamentally change our lives – not necessarily in a good way
View of House

- Universal user interface, implicit user interaction
- Looks similar to current house or homes of the past: physicality
Methodology

• Ethnography, cultural probes
  – Collecting ideas from other user groups
• Programming tools/ rapid prototyping
• Evaluation techniques
The Future

• In 5/10 years, will we have mass acceptance and availability of cameras/microphones/sensing technology?
• Coming soon: home health, entertainment, home automation, home support
• 50 years: 3-D printing, nanites to create functional devices we see on the Internet
Impacts on home/city design

• Build homes close to companies
  – Mixed initiative/multi-purpose developments
• Interior design
• Environmental impact
• More focus on the artifacts that we value
• Greater focus on aesthetics combined with functionality: best of both worlds