PHILIPS

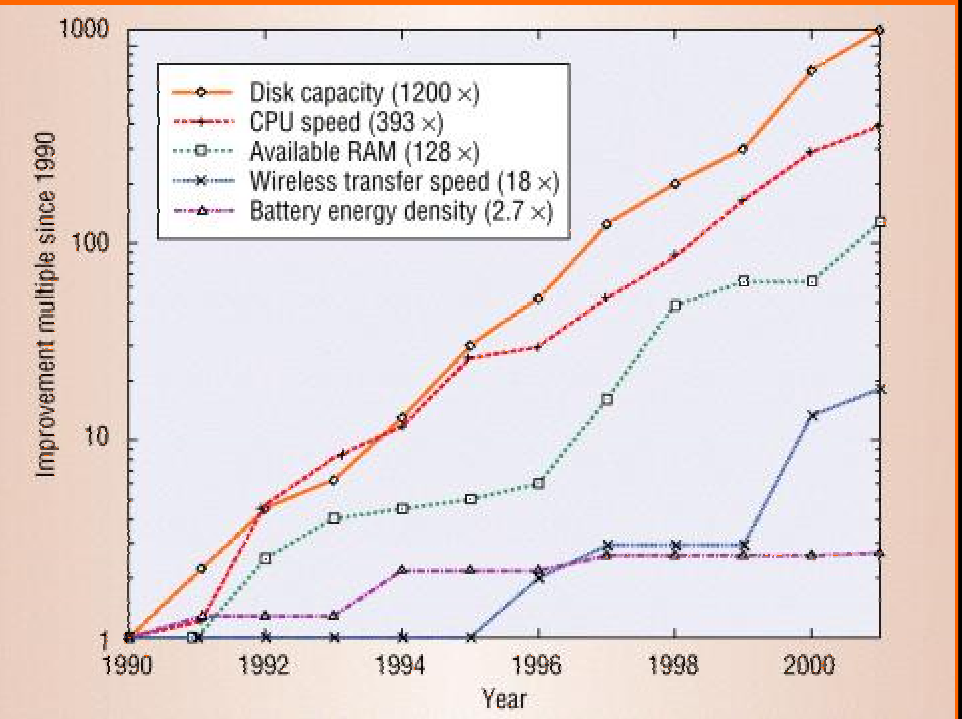
Ambient Intelligence research in HomeLab

Boris de Ruyter

Ambient Intelligence Research In HomeLab

- Technology trends
- The vision
- Fact file
  - historical facts
  - international projects
  - keynote speeches
  - press coverage
  - benchmarking
- HomeLab
  - usability research
  - projects

Storage
Displays
Platforms
Connectivity



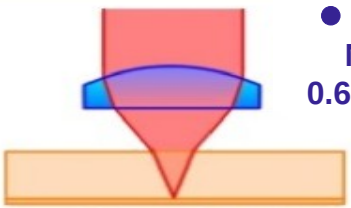
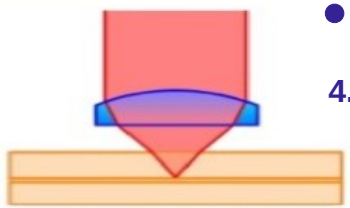
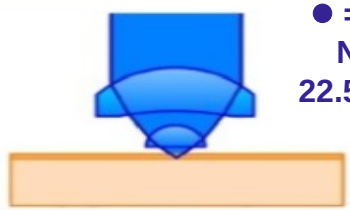
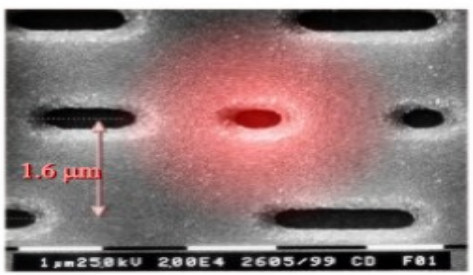
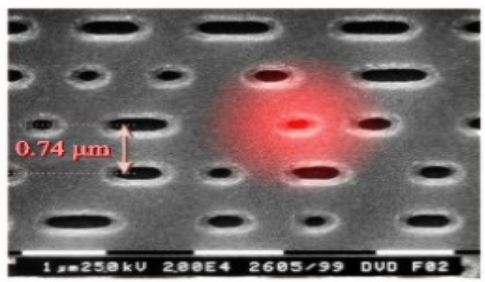
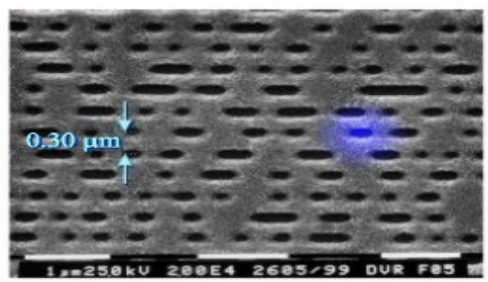
The ongoing miniaturization

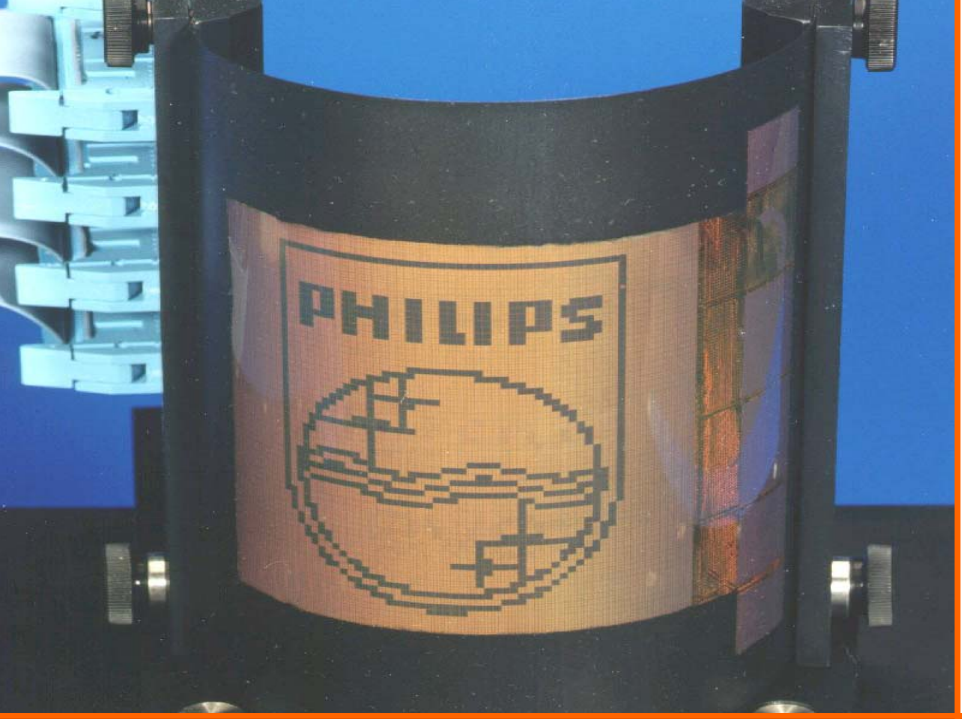
allows integration of electronics
into peoples' environments

Blu-ray disc for high-definition TV

- Small read-out spot achieved by
  - Blue laser
  - Very strong lens (NA = 0.85)
  - Thin cover layer
- 22.5 GB on a single side RW disc

Storage

CD 0.65 GB	*DVD (2x)4.7GB*	*Blu-ray (2x)22.5 GB*
● = 780 nm NA = 0.45 0.65 GBytes  1.2 mm substrate	● = 650 nm NA = 0.6 4.7 GBytes  0.6 mm substrate	● = 405 nm NA = 0.85 22.5 GBytes  0.1 mm substrate
		



Displays

- World’s first
  - working flexible matrix display
  - all-polymer active-matrix display
- Light, thin and roll-up capability
- Unlimited shape and form
- On any surface

Cholesteric texture LCD

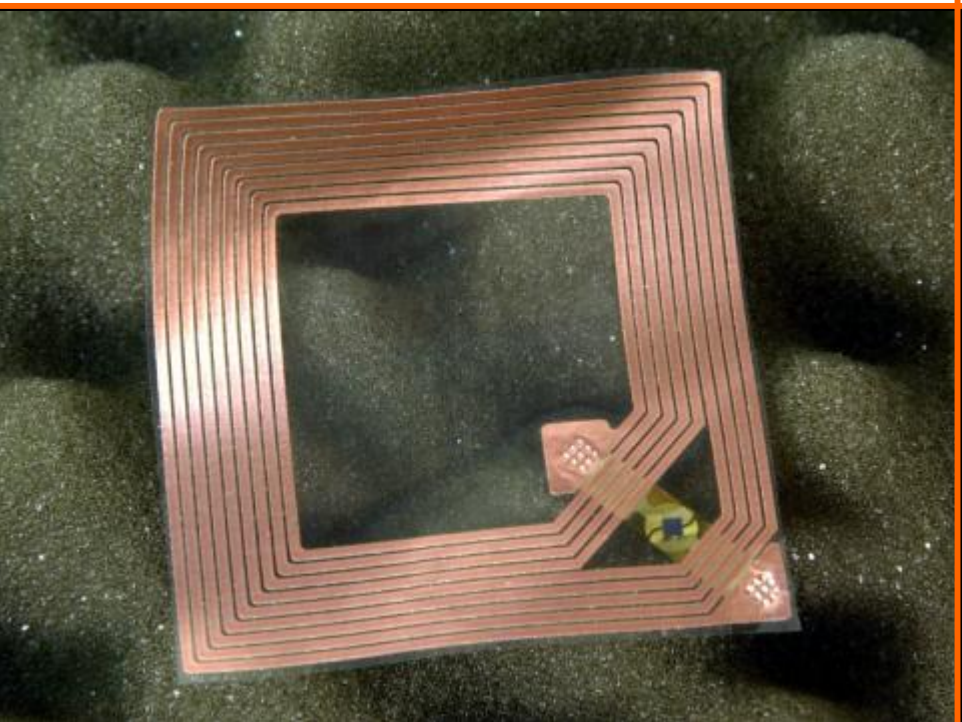
- Passive matrix 64x64
- Thickness 250 micron
- Radius of curvature > 2 cm
- Size 12x15 cm

IC platforms

- Standard silicon
- Full freedom of substrate choice
- Low-cost wafer-scale post processing
- Compatible with standard IC assembly techniques

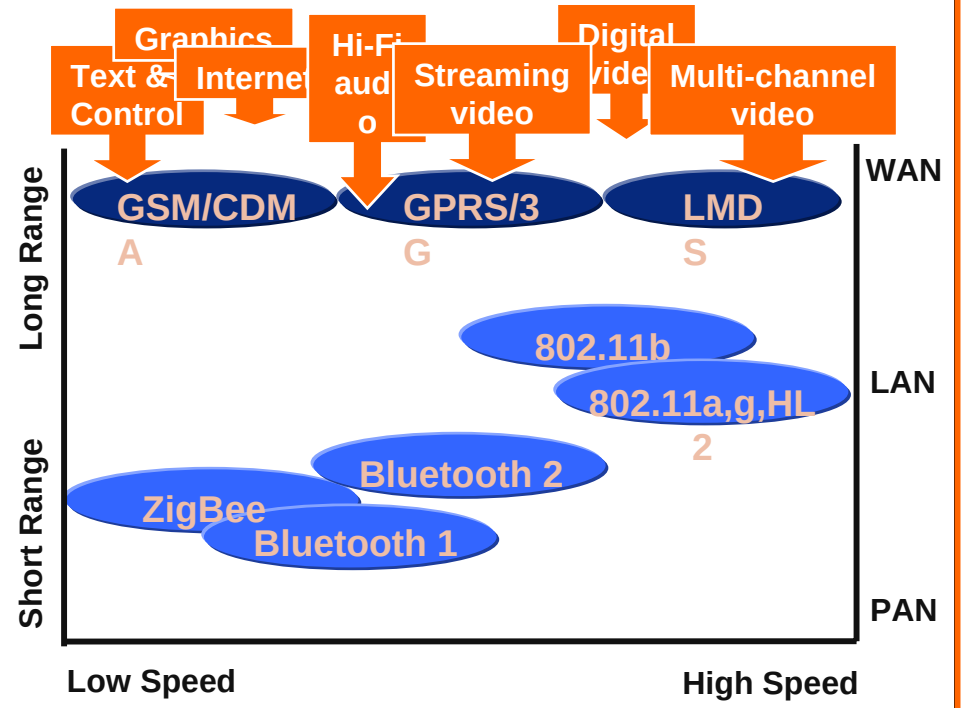
Silicon on anything

Connectivity



Tagging devices

Active and passive



Connectivity

- All ranges are covered
- Wired and wireless

Towards ubiquitous connectivity


more storage and connectivity
=
more content
=
more functionality
=
more interaction

Ambient intelligence refers to electronic environments that are sensitive and responsive to the presence of people

Ambient intelligence

=

Ubiquitous computing

+

Intelligent social user interfaces

Ubiquitous computing

(Weiser 1988)

Swarms of embedded micro devices

Walls painted with “electronic dust”

Electronic notepads and whiteboards everywhere

Distribution, transparency, and ubiquity

Intelligent social user interfaces

(Nass & Reeves 1996)

Media Equation

Multi-modal

Personalized

Emotion and experience

Ambient intelligence

Digital environments that are sensitive and responsive to the presence of people

Embedded

Context aware

Personalized

Adaptive

Anticipatory

Smarter living

Technology for people

Many invisible distributed devices throughout the environment,

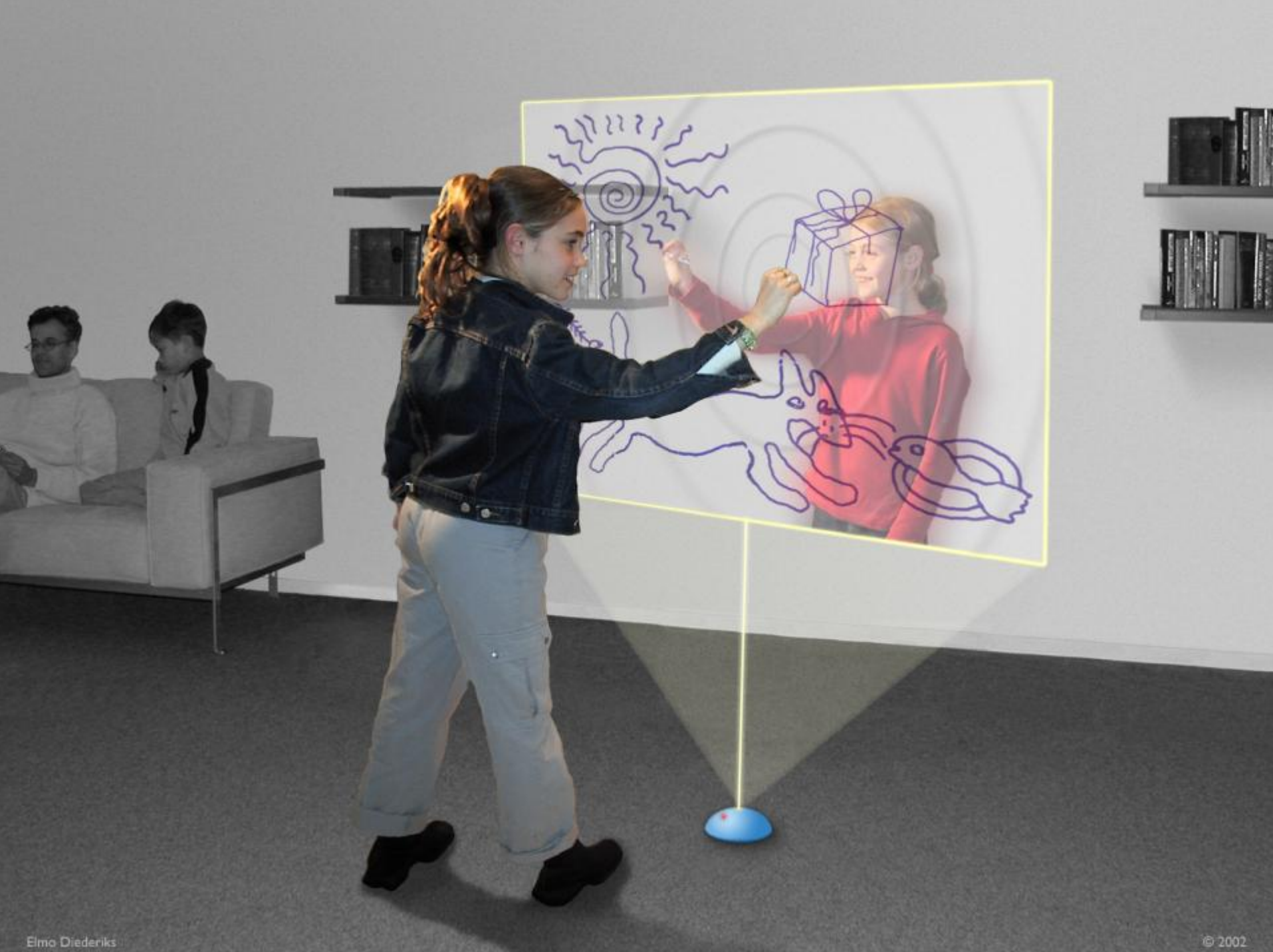
that know about their situational state

that can be tailored towards your needs and can recognize you,

that can change in response to you and your environment, and

that anticipate your desires without conscious mediation


PHILIPS
PLAYER: van Bomm
GOALS: 1
ASSISTS: 6
SEASON
GOALS: 12
ASSISTS: 67
Elmo Diederiks
© 2002


Elmo Diederiks
© 2002

Historical facts

Ambient Intelligence Fact File

1988: Ubiquitous Computing
Mark Weiser

1996: “Vision of the Future”
Philips Design

1999: “La Casa Prossima Futura”
Philips Design

1998: Concept launch

1999: Philips Research Strategy

2001: Philips Strategy

2001: IST 6th Framework

2002: Opening HomeLab

2003: “The New Everyday”

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Ubiquitous computing

(Mark Weiser, Scientific American 1991)

The Computer
for the 21st Century

Specialized elements of hardware and software, connected by wires, radio waves and infrared, will be so ubiquitous that no one will notice their presence

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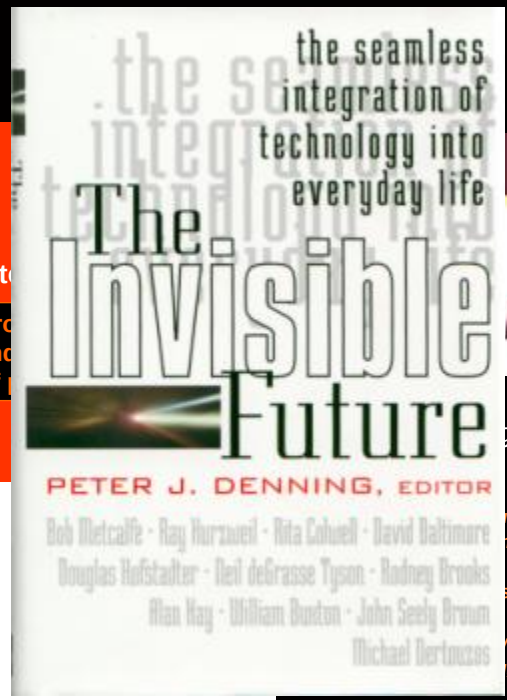

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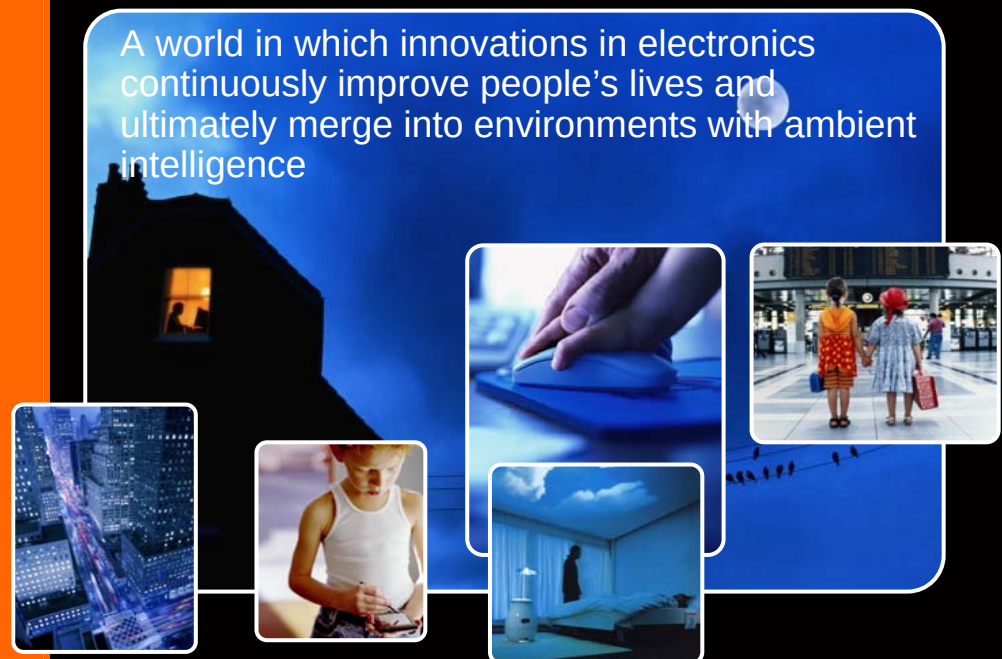
Our Research Vision



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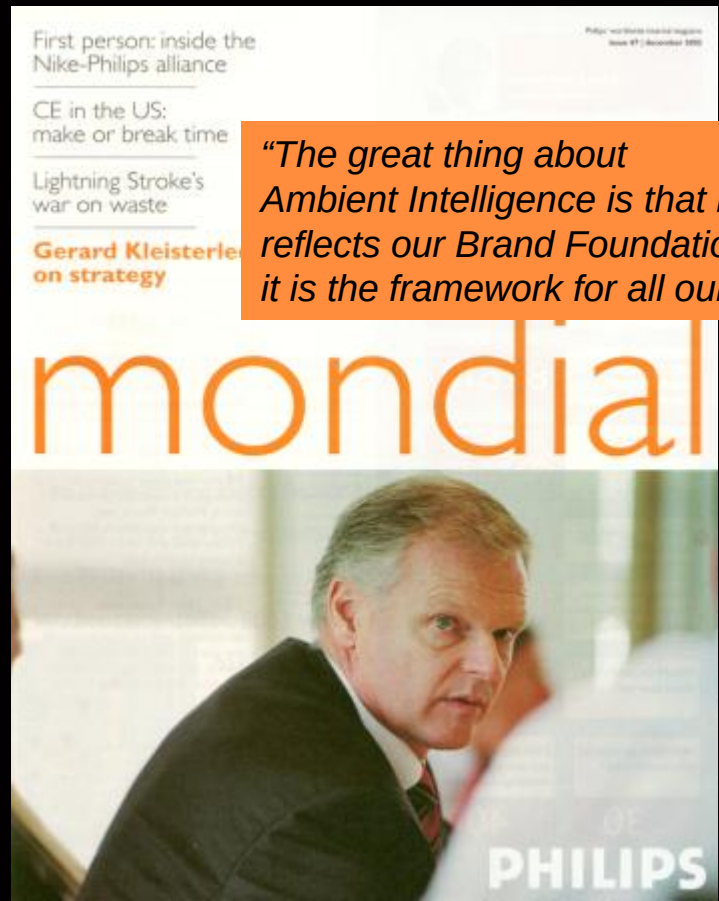

"The great thing about Ambient Intelligence is that it fully reflects our Brand Foundation and that it is the framework for all our activities"

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Data and content management
Computational intelligence
User centered engineering
Contextual awareness
Networked storage
Pervasive wireless
Smart materials
Electronic dust
Ambient audio
Displays
Vision
Speech
Ambient video
Ambient lighting
Trust and privacy
Internet computing
Wearable computing
Pervasive middleware
Peer-to-peer computing
Ubiquitous communication
Ambient computing platforms

Ambient Intelligence Fact File

International projects

- ITEA Ambience
- Oxygen alliance
- Ozone

Ambient Intelligence Fact File

Keynote speeches

- ACM1 2001
- EURO 2001
- CES 2002
- ICT Kenniscongres 2001
- IITC 2002
- ISSCC 2002
- IST 2002
- ICT Kenniscongres 2002
- MEDEA+ 2002
- WWRF 2002
- DATE 2003
- ULSI 2003

Ambient Intelligence Fact File

Press coverage

- More than 100 articles
- More than 25 TV programs

ubiquitous computing

pervasive computing

augmented spaces

intelligent environments

ambient intelligence

pervasive computing

augmented reality

sentient computing

aware computing

interactive workspaces

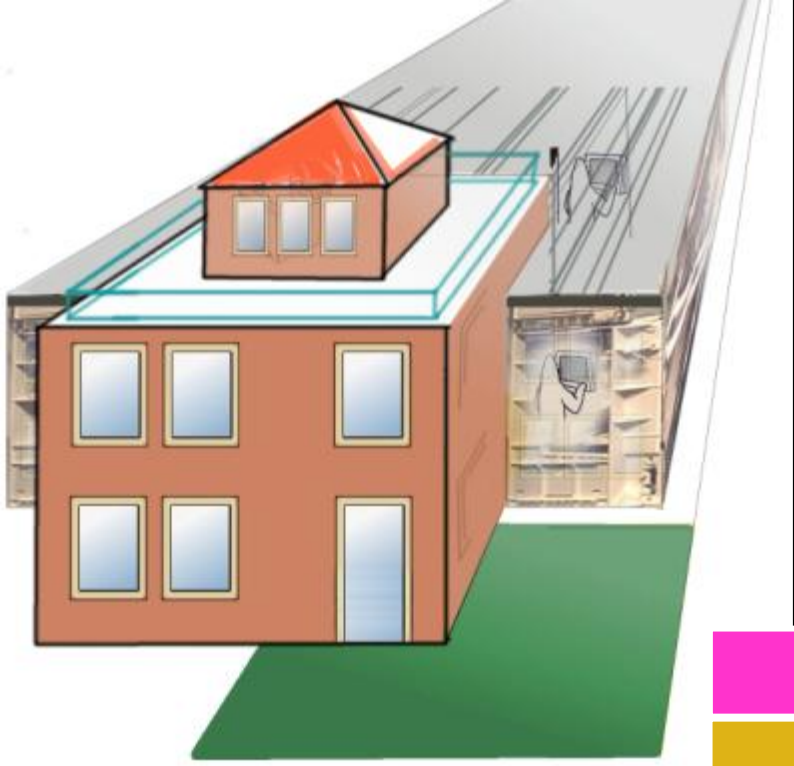
Benchmarking

Ambient Intelligence is In good company

infrastructure

Ambient Intelligence research in

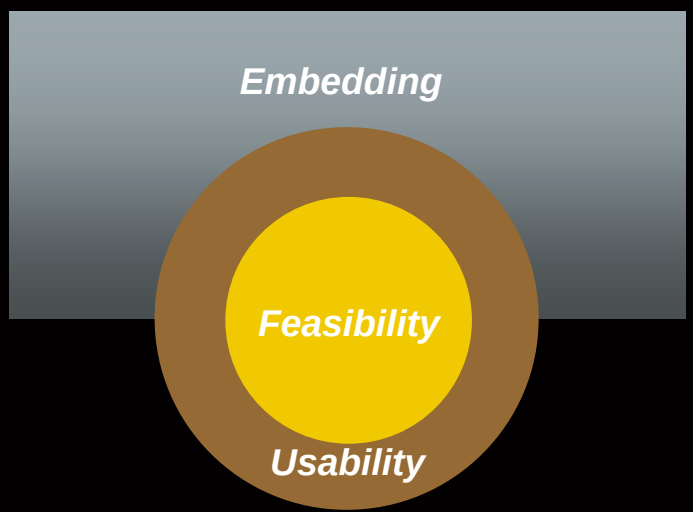
HomeLab

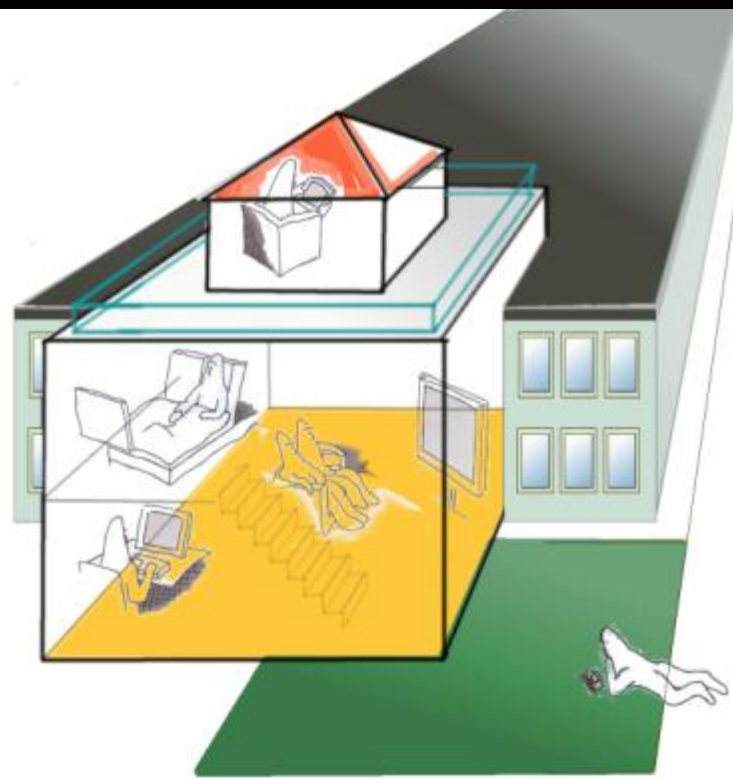


Building the Vision

Design a laboratory for Feasibility and Usability Studies in Ambient Intelligence

The 1998 artist impression

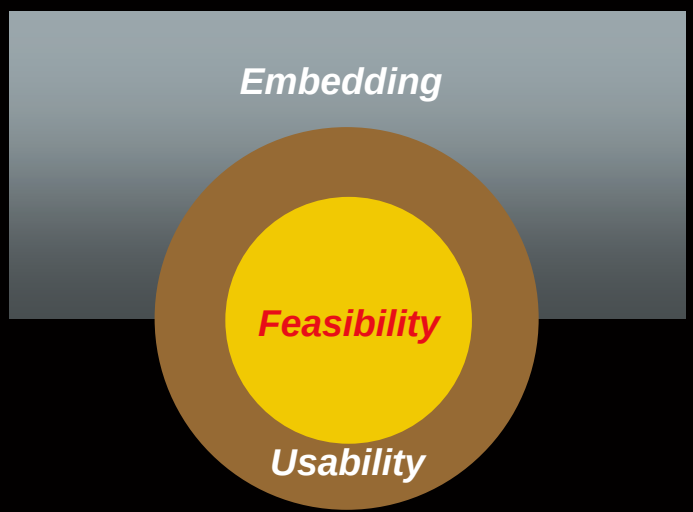




Building the Vision

Design a laboratory for Feasibility and Usability Studies in Ambient Intelligence

The 2002 reality

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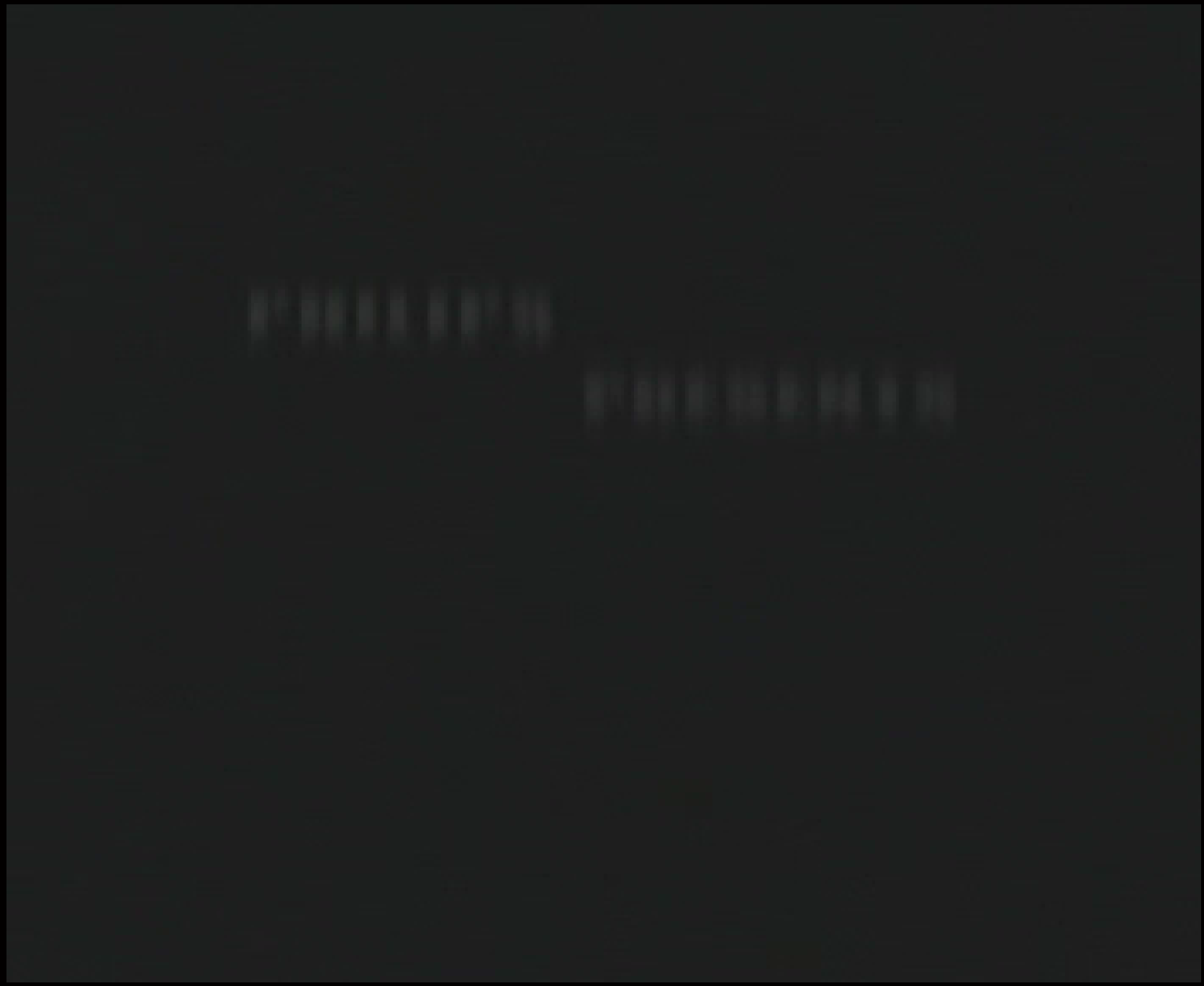
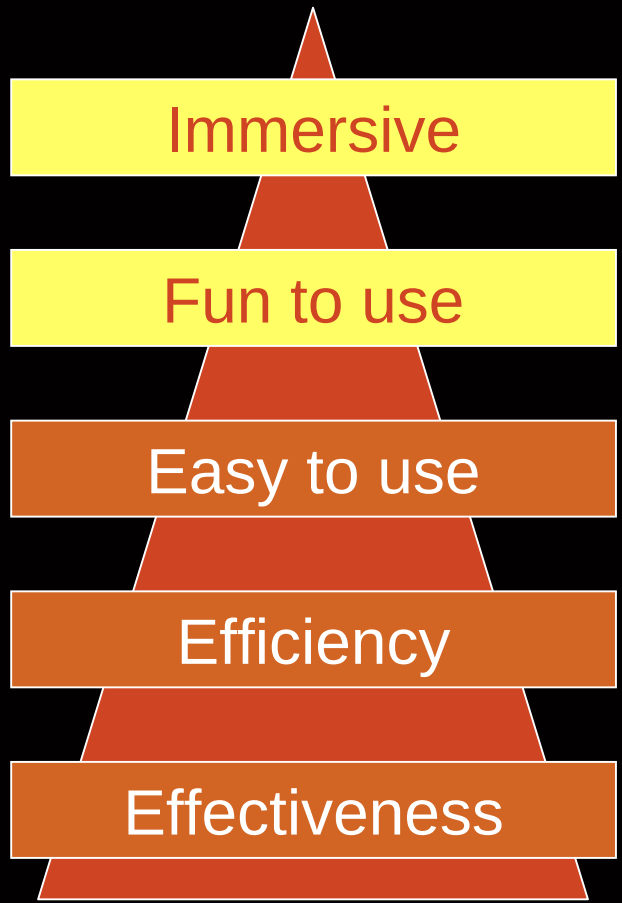
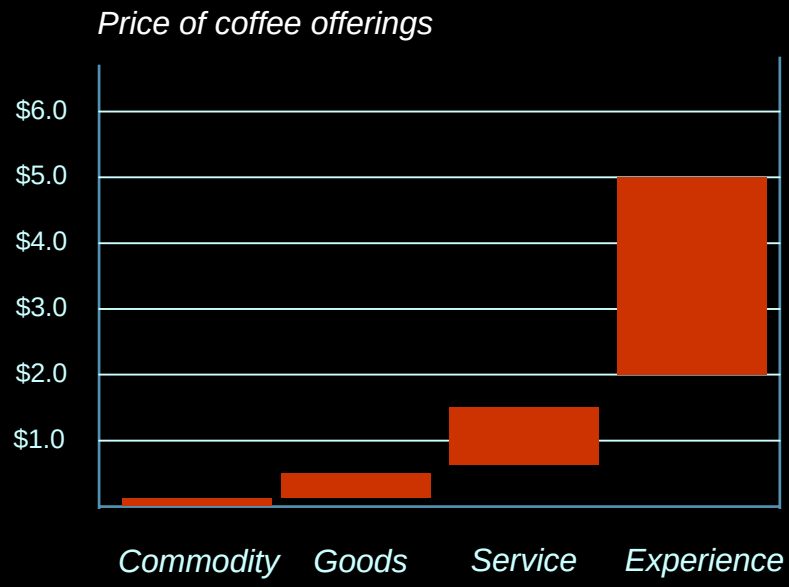


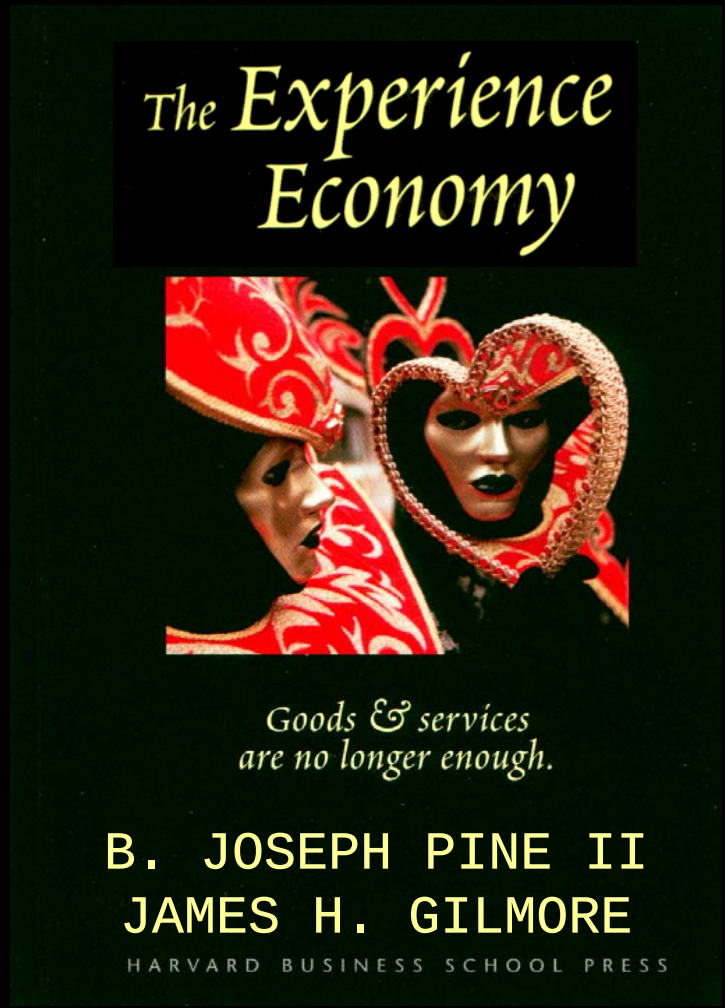
Usability research

the user experience



Usability research
the user experience





Usability research
the user experience

Usability research
preparing observations

Types of observation:

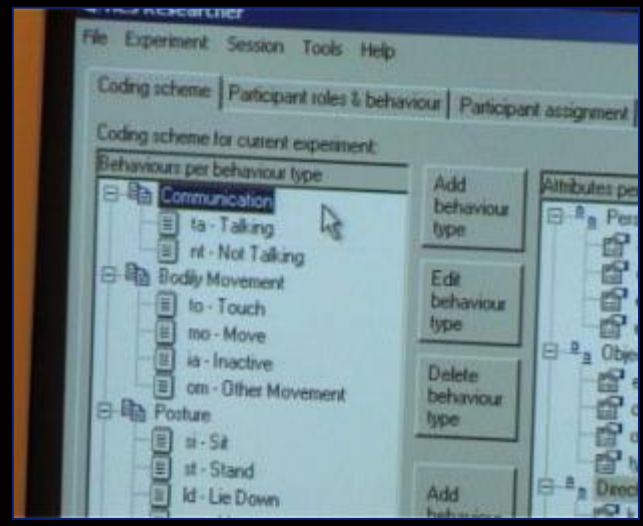
- Exploratory: no scheme, just observe
- Systematic: coding scheme for classification of behavior

Preparing systematic observations:

- Decompose the behavior into indicators
- Operationalise the indicators in a coding scheme with:
  - Mutually exclusive and exhaustive categories
  - Context independent behavior

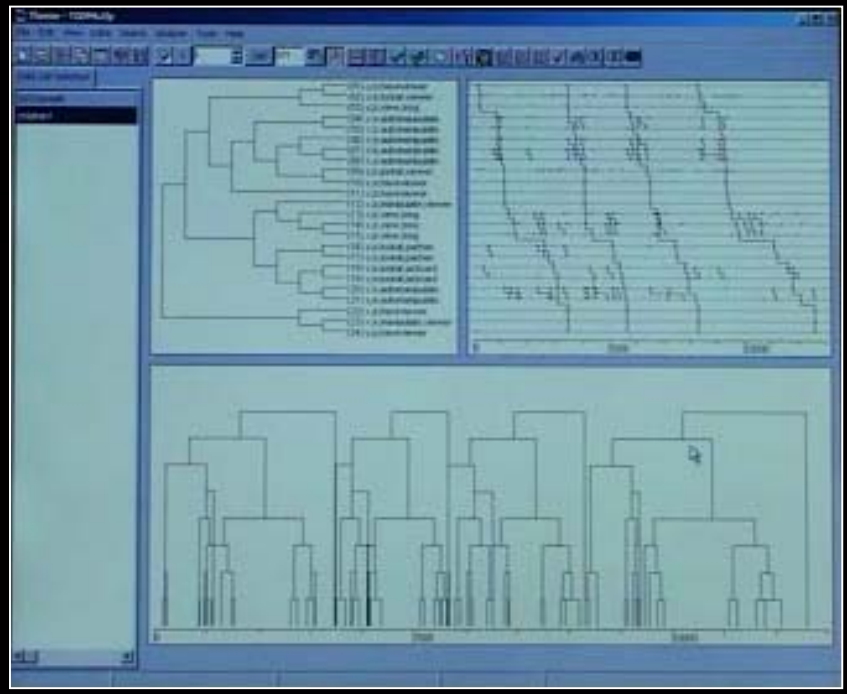
Usability research
doing observations

- Multi observer setup
- Control & coding in one system
- Distributed coding scheme
- Observed and automated events

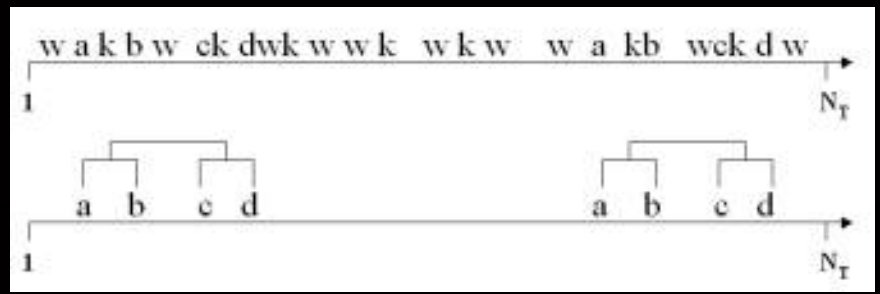


Usability research
analyzing observations

Remote data analysis
(incl. video streaming)



From simple frequency analysis up to the detection of hidden patterns in behavior



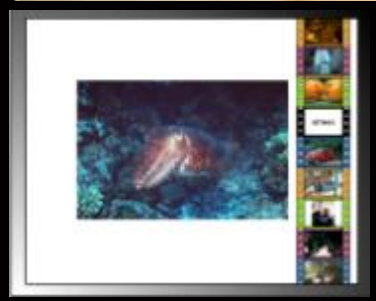
Ambient Intelligence research in

HomeLab

projects

Easy Access
(Boris de Ruyter)

CE: Audio



Phenom
(Evert van Loenen)

CE: PC Peripherals

WWICE
(Mark Verberkt)

CE, SC

Smart Mirror
(Joost Horsten)

New Business

Nebula
(Philips Design)

Pogo
(Philips Design)

Toons
(Marcelle Stienstra)

The story continues

Ambient Future


PHILIPS