

# PHILIPS

## Amigo in Hindsight Lessons learned

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## Lessons learned

1. Intelligent home environments
2. Vision and timing
3. User-centered approach
4. Complexity at many levels
5. System and application developers needs
6. Creating impact
7. Technology moves on
8. Differences in time to market

## Content

Tati

1958



Amigo

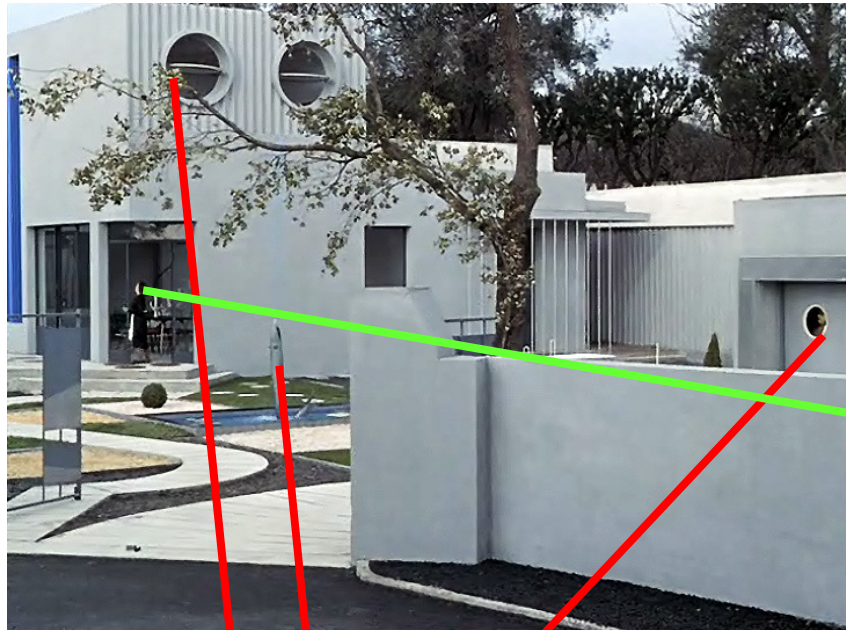
2008

Lesson 1

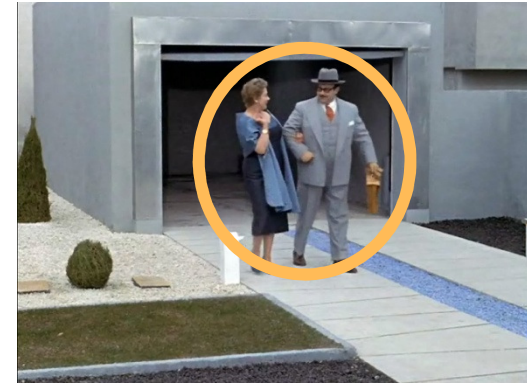
Intelligent Home  
Environments

Old concept !!!!!!!!

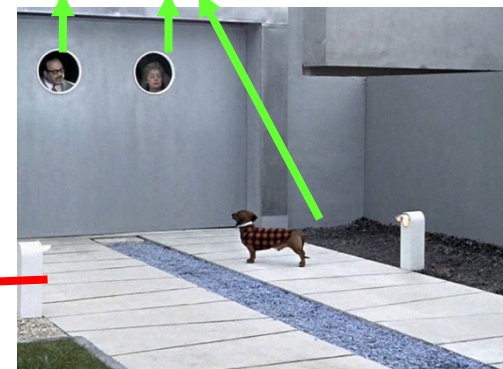
# Intelligent Home anno 1958



Context



Agents

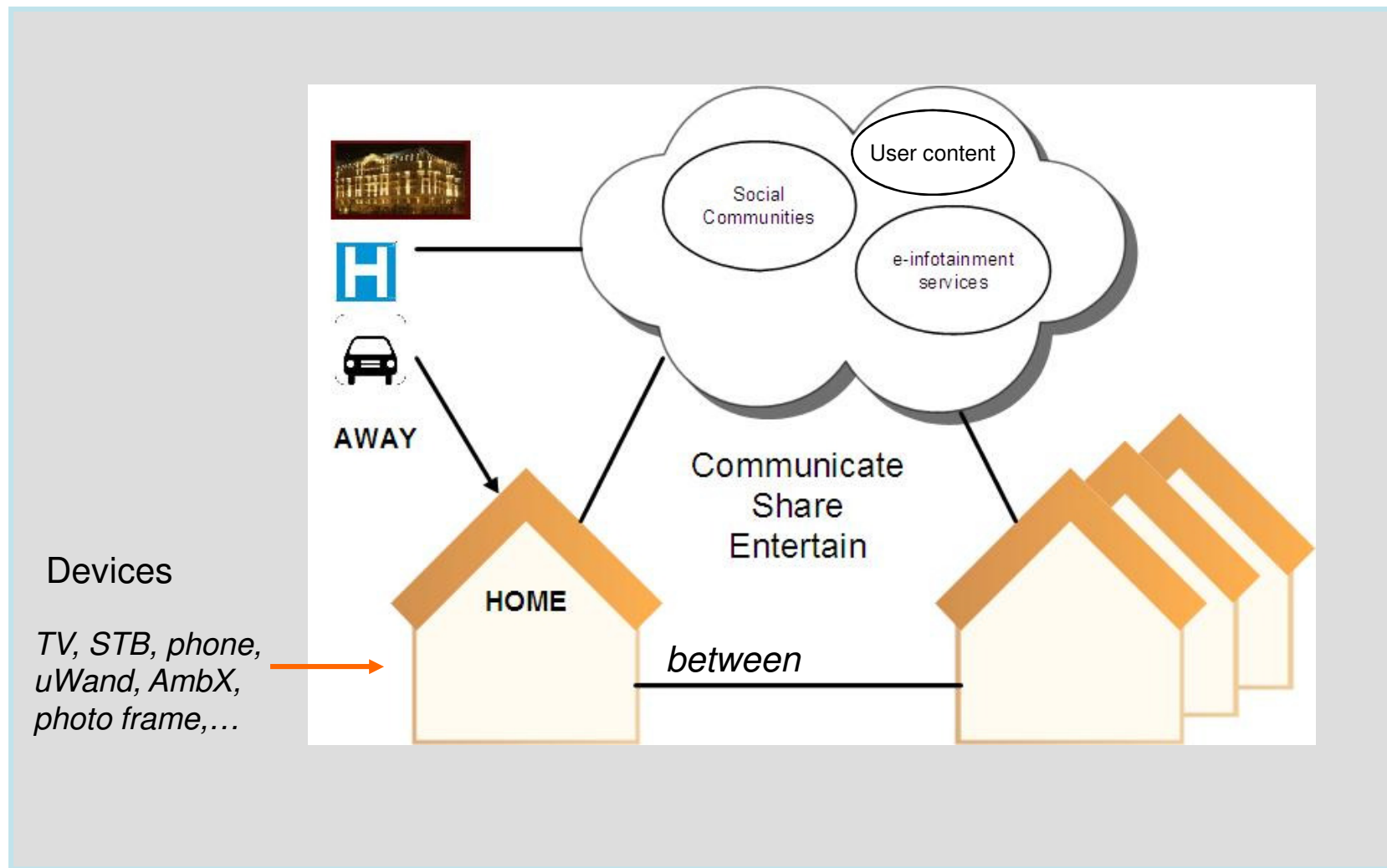


Products

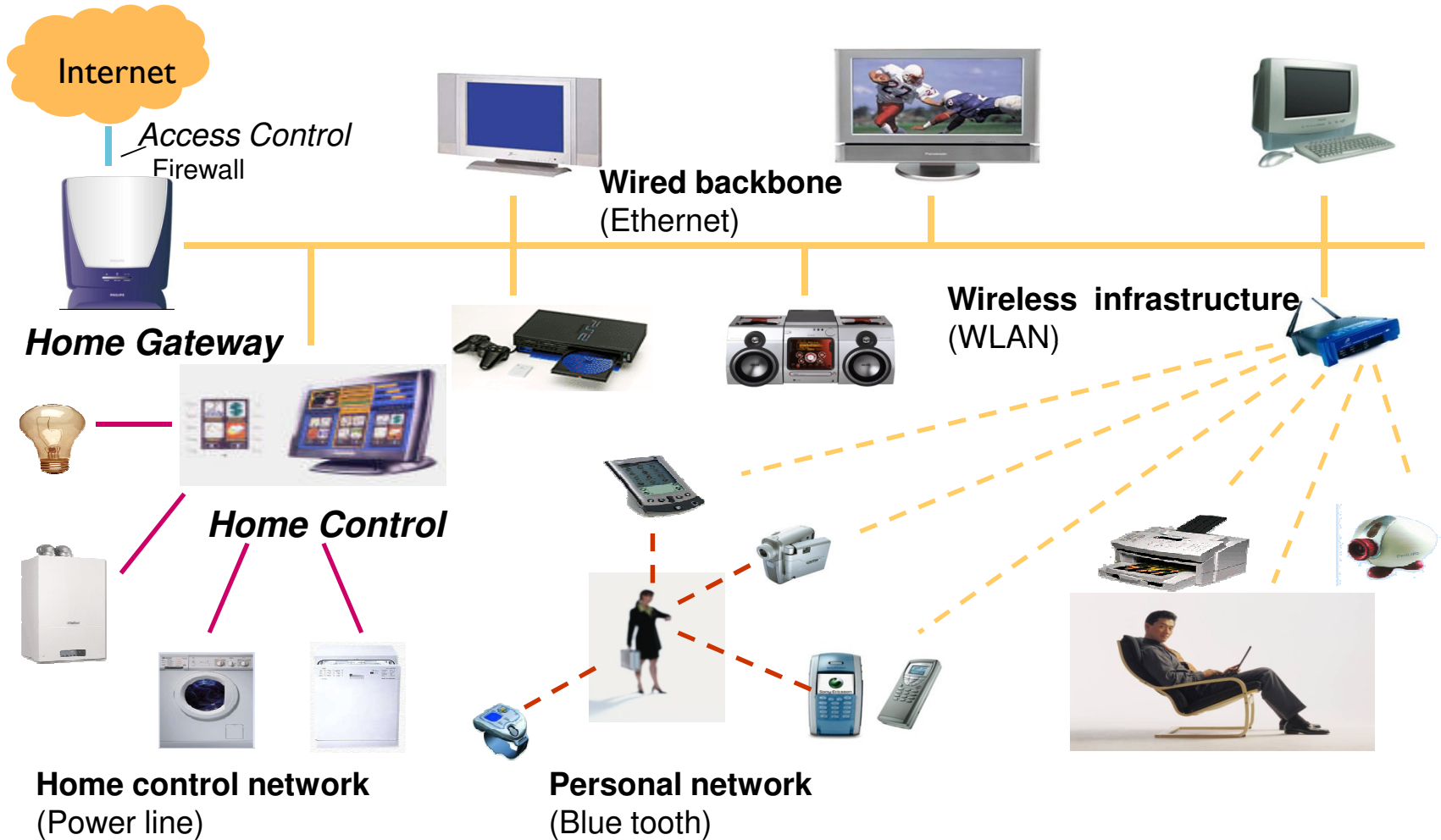
huge discrepancy  
between  
research and reality

Lesson 2  
Vision and Timing

# Future Enabling Applications

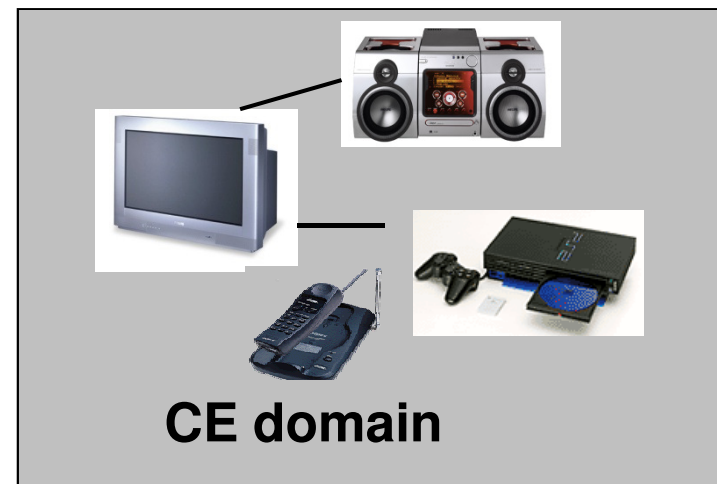
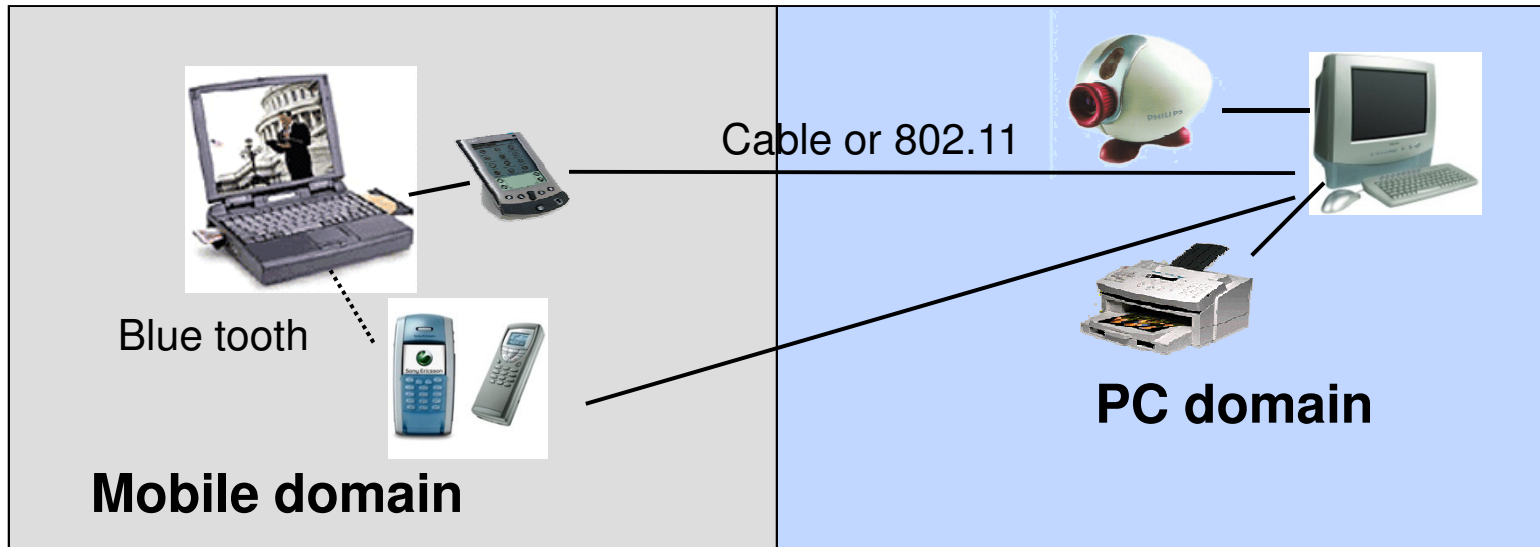


# Amigo Home Network

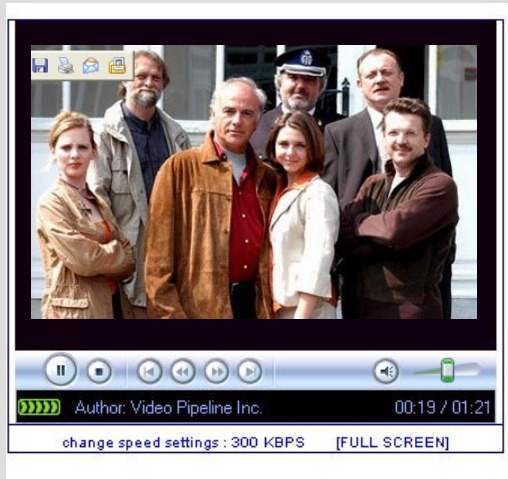


# Intelligent Home: Reality in 2004

## Different Domains - Not Interoperable -



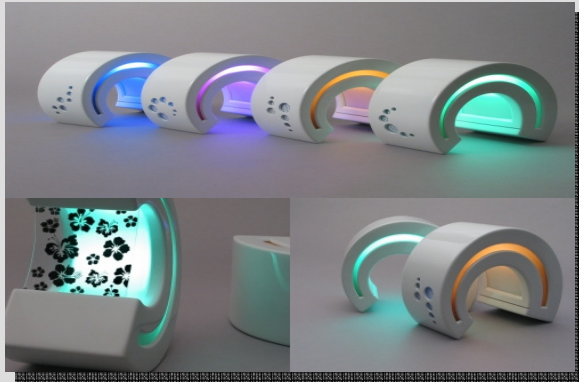




Not **within** the home  
Not **between** homes

## Services: **To** the Home

- down/up loading content
- Internet
- communication
  - email, chat, voice-IP, skype
- multi-user gaming
- adaptation of personal content
  - photo, video
- customization
  - ring tones, wallpaper



*sharing  
ambience and activities*



*pictures and text docs*

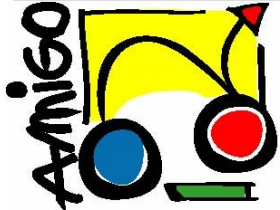


## End-Users

Do not distinguish between the technical Amigo domains

Desire control over the overall comfort and social integrity of their home environment

*Interoperability is obvious and natural for users*



## Project Goals

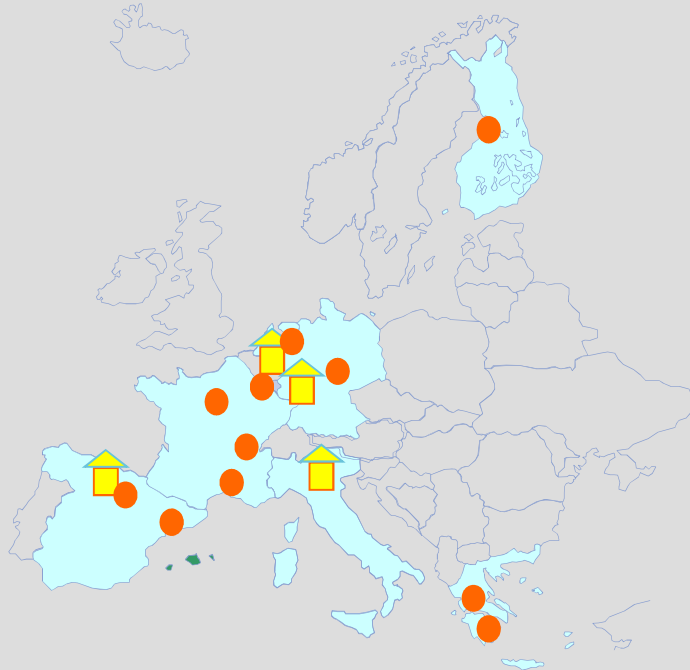
Service oriented architecture for intelligent future home networks,


- use available context information
- use different devices
- provide intelligent and attractive user services
- compose and integrate new devices and services

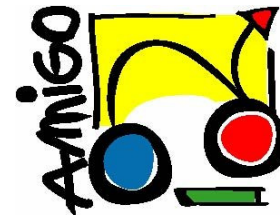
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Enable the development of context-aware applications

- provide users with experience sharing, social presence, and responsive home environments
- extend their home to other homes, car, hotel, office, ....

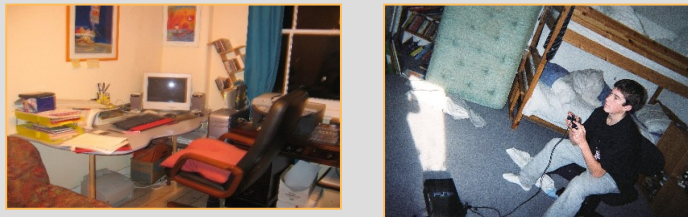
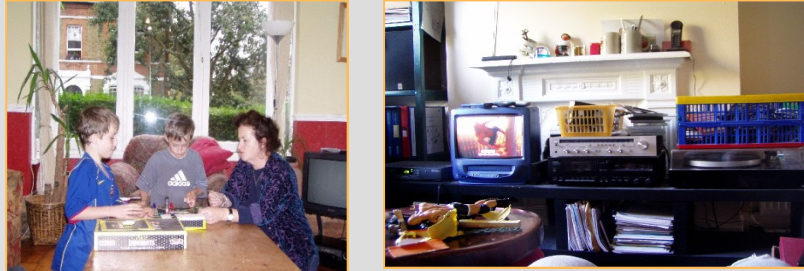


42 Months (Sept04 – Feb08)  
2021 Person months  
4 Home labs 



Amigo Project  
IST-2004-004182

Philips  
VTT , Telematica Instituut  
Fraunhofer, Microsoft,  
Univ. Paderborn, INRIA,  
France Telecom, Italdesign  
Fagor, Ikerlan, Telefonica  
LogicDis, ICCS



## Lesson 3

# User-centered Approach

- field studies
- user needs: caring & sharing
- requirements
- scenarios
- storyboards
- personas

## Responses

- based on past and current experiences
- questionable fit for the project objectives and context

## But

- crucial for project team,
  - to gain end-user insights
- essential for getting
  - user requirements
  - evaluation procedures and criteria
  - design iterations

## Keep in mind

- ***‘You can’t just ask customers what they want and then try to give that to them. By the time you get it built, they’ll want something new’***
- ***‘It’s really hard to design products by focus groups. A lot of times, people don’t know what they want until you show it to them’***

***Steve Jobs***

## Difference in perception

- user needs & requirements
- system requirements & specs.
- developer visions & implementations

## Underestimated challenge

- huge number of variables
- causing an **exploratory explosion** of problems

## Lesson 4

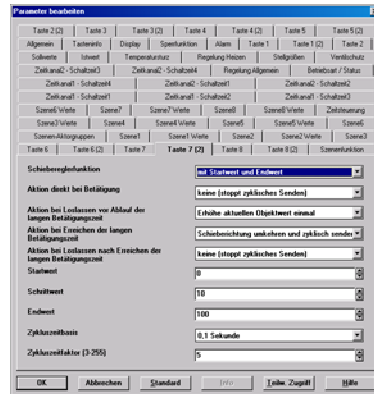
# Complexity at many levels

# taming technology

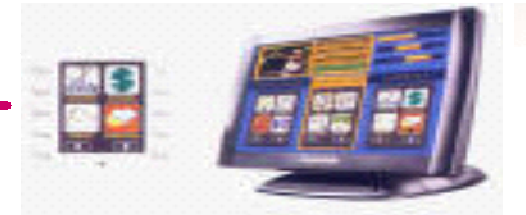
# Complexity for User



## ## Ambiance settings



Configure a 4-way switch with  
build-in temperature control  
56 folders  
277 parameters



## Home Control



## Home control network

84 programs

6 programs



# Complexity for Developers

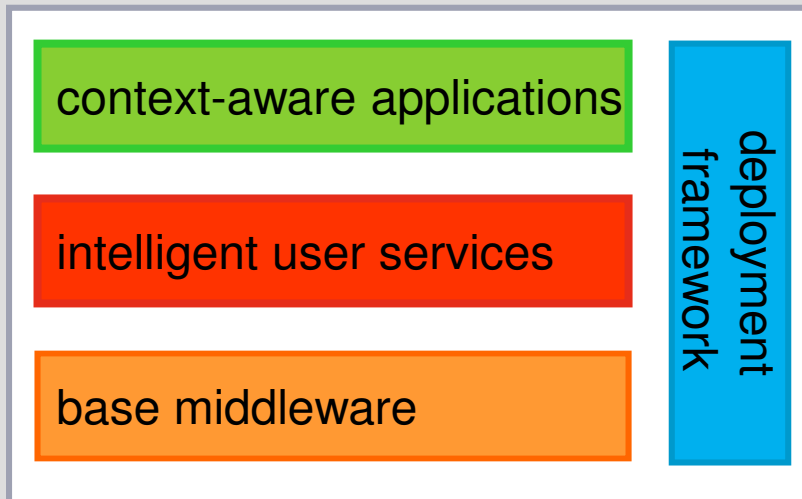
Building blocks & subsystems  
Toolkits



## Complexity in Communication



Middleware  
building blocks



## Lesson 5

### System & application developers needs

Smart homes are **dynamic environments**

- interoperability framework
- service oriented architecture

- service discovery and interaction interoperability
- enhanced discovery and service composition
- domotic infrastructure
- security and privacy
- content distribution / data store / QoS

## Base Middleware

- functionality for networked environment
- Open Source Software

- context management
  - broker
  - source
  - wrapper
  - reasoner
  - history
- user modeling and profiling
- awareness and notification
- user interface services
- privacy and personal security

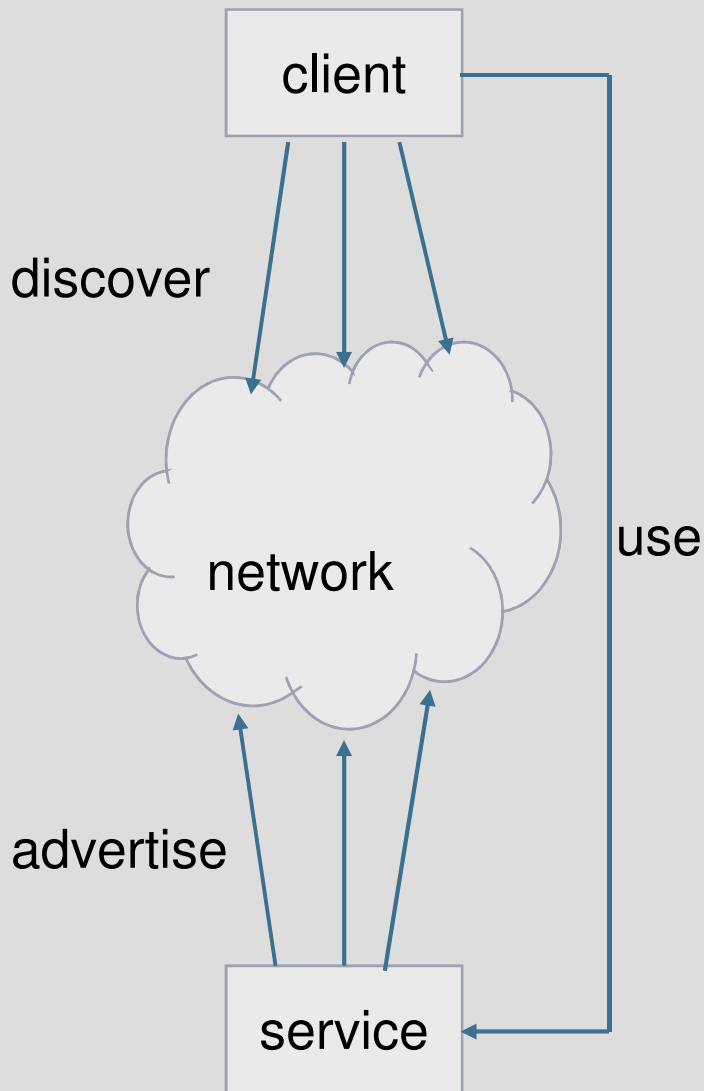
## Intelligent User Services

- functionality for ambient environment

- reduction of programming effort
- enforcing interoperability
- common set of protocols
  - discovery
  - remote procedure calls
  - asynchronous event delivery

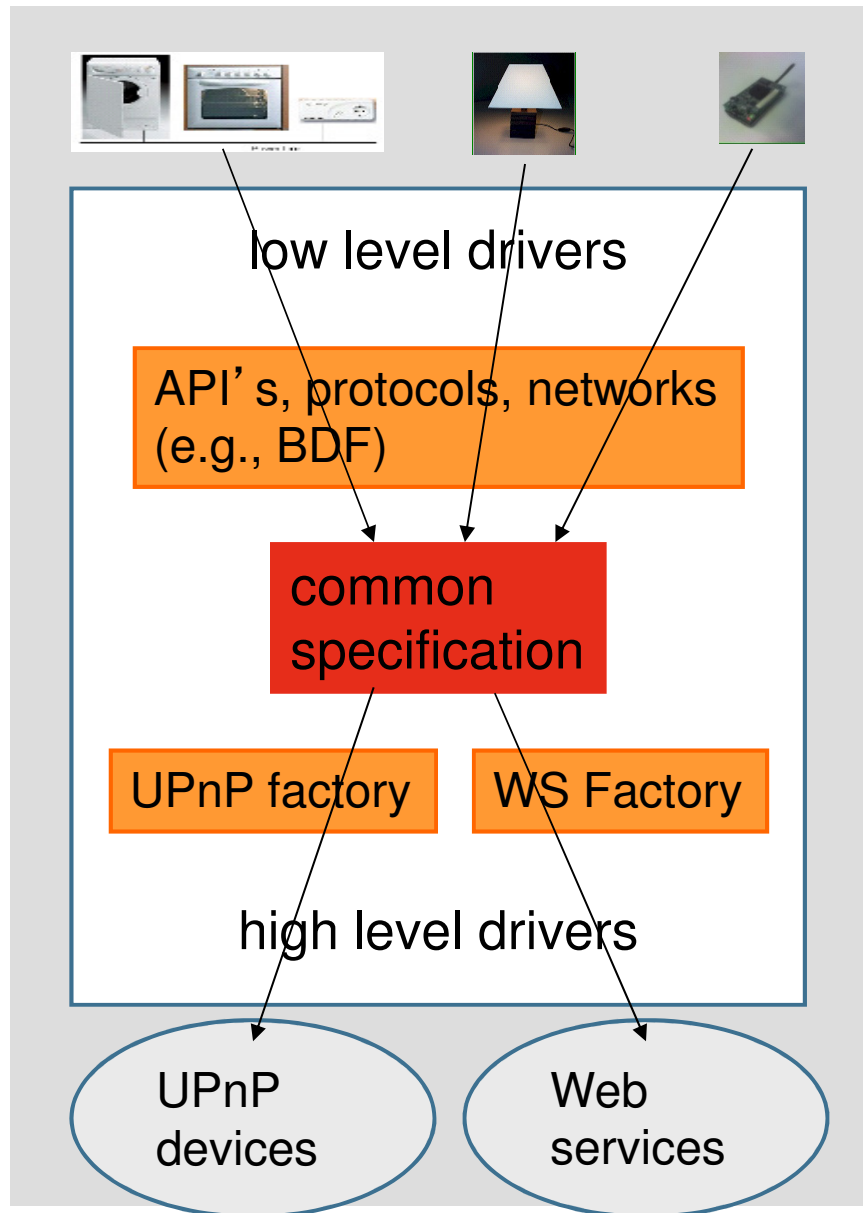
## Programming & Deployment Framework

- no care about underlying protocols



# Service Oriented Architecture

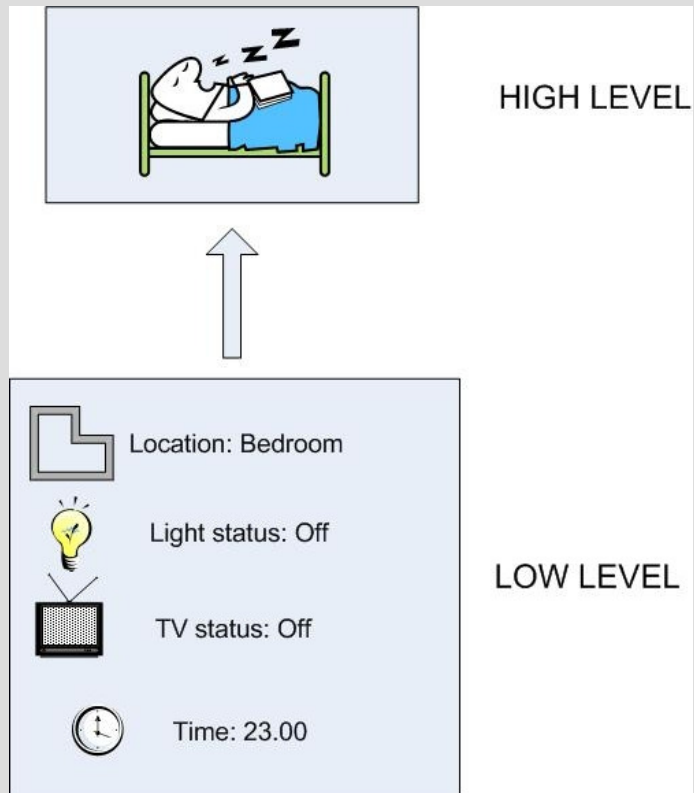
- on demand
  - development
  - delivery
  - use
- loosely coupled components
- dynamic configuring of services and devices
- multiple protocols
  - discovery: UPnP, SLP, WebServices
  - interaction: RMI, SOAP



## Domotic Service

- expose devices as UPnP or Web services
- low-level and high-level drivers are completely decoupled
  - depend only on common specification





Interpreting low level context to high level context

## Context Management Service

- open infrastructure
- acquires information from various sources
  - physical sensors,
  - user activities,
  - applications
- abstracts into "context information"
- provides to context aware services

Example of how to start building an application:

1. deployment framework,
  - discovery mechanism & ontologies
  - context management service
2. security & enhanced discovery
  - user modeling & profiling service
  - awareness & notification service
3. user interface service
  - community sharing service

## Use-it

- **training modules** and **tutorials** for all SW modules
- available on the Amigo website
- **easy** to build an Amigo service
  - ~ 1 day
- **understanding** the concepts takes longer
  - ~ weeks

Must have examples

- timely,
- relevant
- appropriate
- easy to understand
  
- illustrative for showing technical tour de force
  
- do-able and achievable
  
- **Customized to your client needs!!!!!!!!!!!!!!!!!!!!!!**

## Lesson 6

### Create Impact

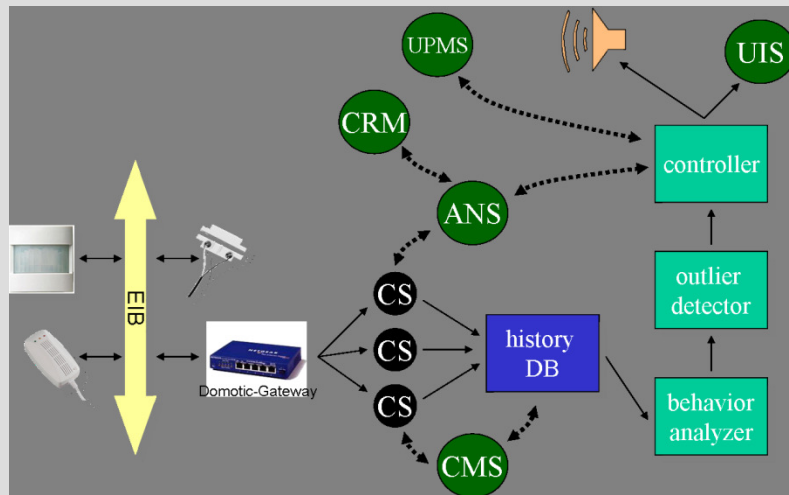
Exploit applications & services

Trade-off between stakeholders and developers



## Appliances Management

- appliances exchange information and communicate via existing power lines
- use case examples:
  - programming appliances from mobile devices
  - creating scenes like wake-up in the morning and setting the toaster and coffee machine
  - holidays settings at home



- components
  - domotic gateway
  - history database
  - behavior analyzer
  - outlier detector
  - controller

## Daily Life Cycle Monitor

- monitors the behavior of inhabitants
- data from different sensors and information from Amigo middleware services
- detects deviations from normal behavior and takes appropriate action



## Food Management

- each user's
  - personal preferences
  - health diets
  - burned calories
  - weight evolution
- how many people are going to eat and who they are
- available goods in the fridge.
- expiration date of the products

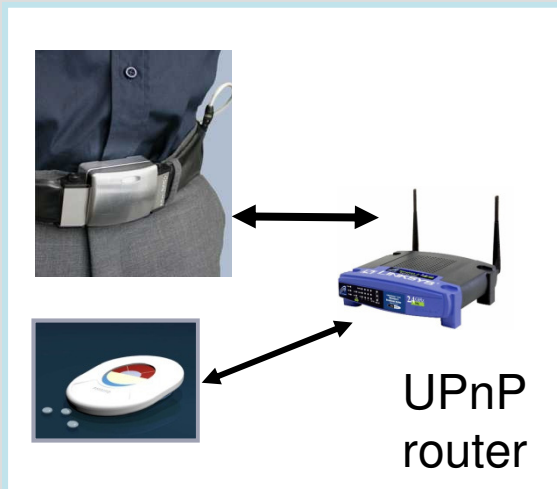


- Home agenda
- MyNews
- Media Manager Core
- Multimedia manager
- Context-dependent personalization

## Home Information & Entertainment

- Amigo Box applications
- Standard protocols: wifi, ethernet, UPnP
- applications are web-based
- no need to buy new devices to connect
- any device with a web browser will do

## My Home



## Your Home

# Home-to-Home

feel at home

- have access to your services
  - applications can use exported services just like local services





## Away-not-Away

- sharing presence and activities
- independent of location and devices
  - using TV with PC, TV with hotel-TV, or mobile with TV, etc.

Now, but **not then**

- Sensor network technologies
- Web 2.0
- .NET
- Social networking

Stay up to speed

- Be **adaptable** and **flexible**
  - to R&D community
  - to future market needs
  - to end-user customers
  - to existing situations

## Lesson 7

Technology moves on

**Fast**

Middleware and application elements have different time to market

Existing infrastructures

- buildings are 'hard'
- power lines
- different practices

Stakeholders and their needs change over time

- energy consumption
- sustainability concerns
- demographic changes
  - elderly homes
  - home health care
  - nursing homes

## Lesson 8

### Differences in time to market

- **Timing**
- No start from 'scratch'
- **Changing** application demands
- Take-up of technology is **not about** technology



Intelligent home environments  
Vision and concepts

Management

User-centered approach

Complexity at many levels

Developers needs

Timing

Creating impact

Technology moves on

Differences in time to market

Watch it  
Iceberg

## Key to Amigo

- unified middleware
- across application domains
- across homes and environments
- connects other networks (e.g., sensors)
- interoperable – existing technologies
- intelligence in the middleware
- reusable by thin applications
- generalized use of semantics
- Open Source Software infrastructure

## System concepts

adaptable  
be flexible

