Ambient Service Space

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Developing Next Generation Services

- Strategic goal:
  - To **bring advances in mobile applications and services within the reach of users in their everyday life** by innovating and deploying new applications and services based on the evolving capabilities of 3G systems and beyond
  - Special attention to families
  - ➢ Casual Service Usage: Make **Ambient Intelligence** controllable by ordinary people

- Research Challenge:
  - To address the **multi-dimensional diversity** in end-user devices, available networks, interaction modes, applications, and services
  - To research **ambient-awareness**, **adaptation**, **semantic interoperability**, and their embodiment in novel services and applications that match key use scenarios of end-users' everyday life

Our Vision

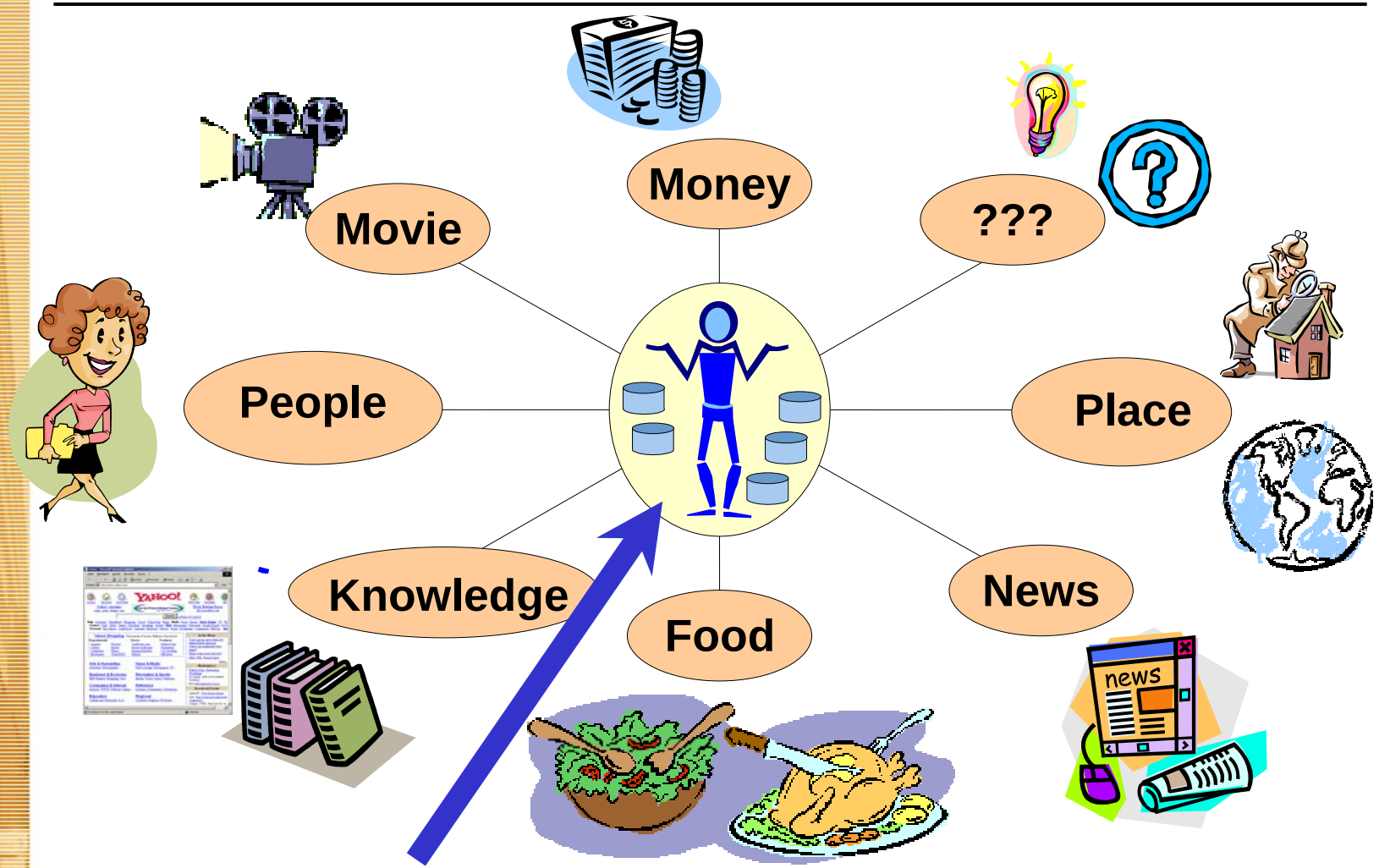
"Information and Services at any time, at any place, in any form with any device, according to personal preferences"

"Personalized Information Services":
news, cinema, concerts, hotels, travel, …

"Personal Information Management":
calendar, contacts,
notes, messages, tasks, …

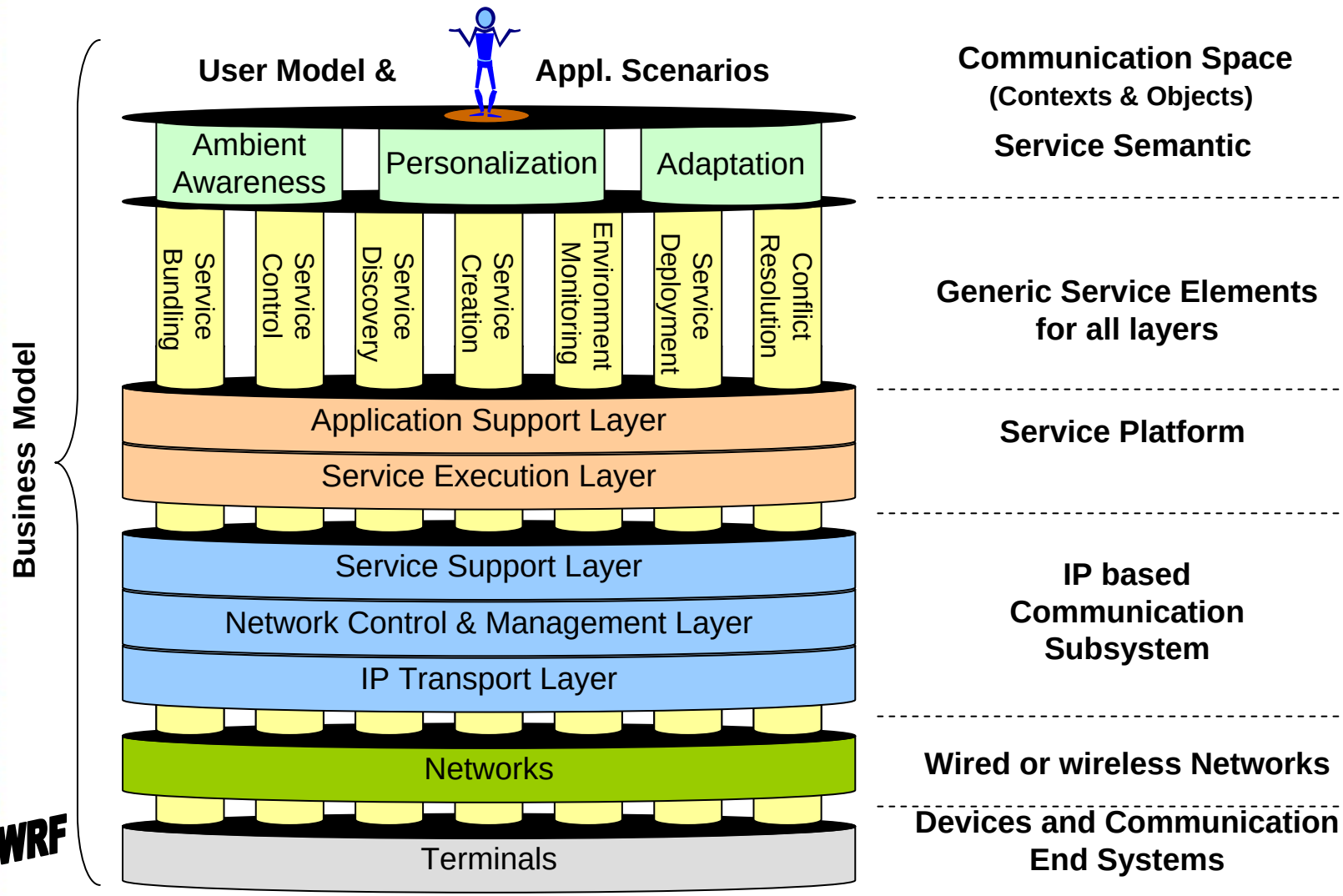
"Personal Environment Control":
TV set, VCR/PVR, air conditioning,
light, surveillance camera, …

I-centric Communications



‚Me, myself, and I' → *I-centric, individual*

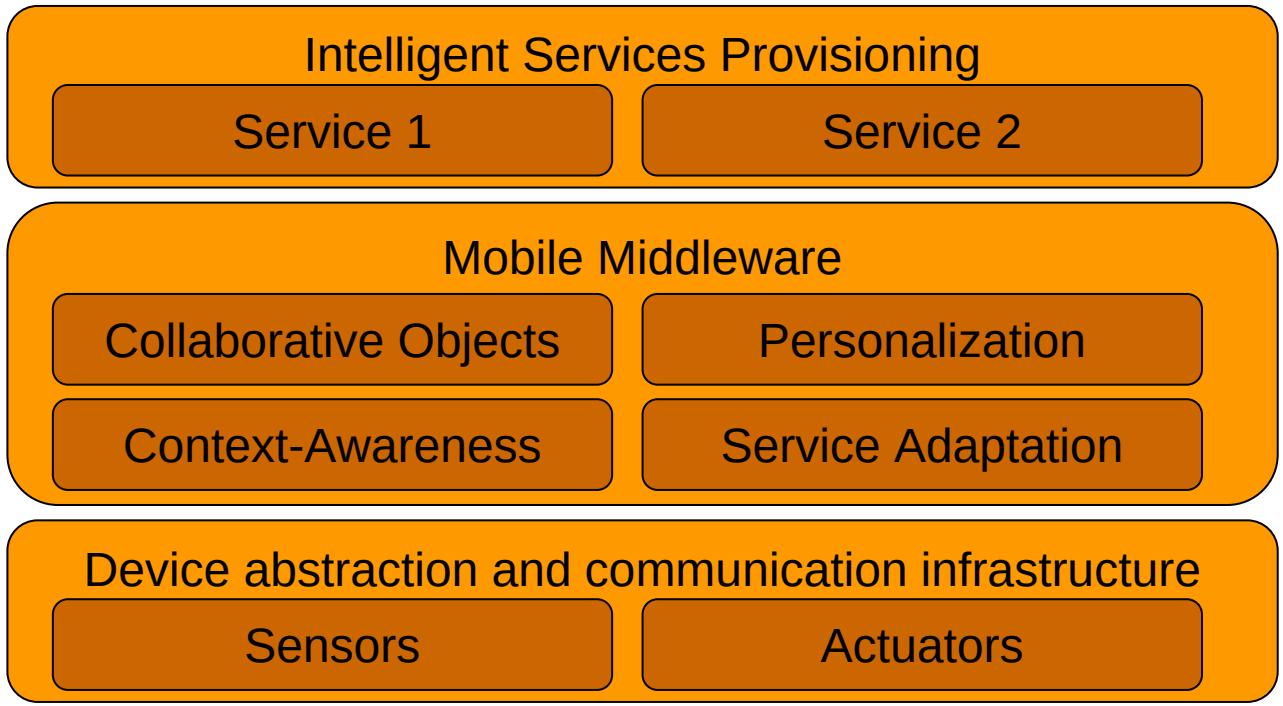
Reference Model for I-centric Communications



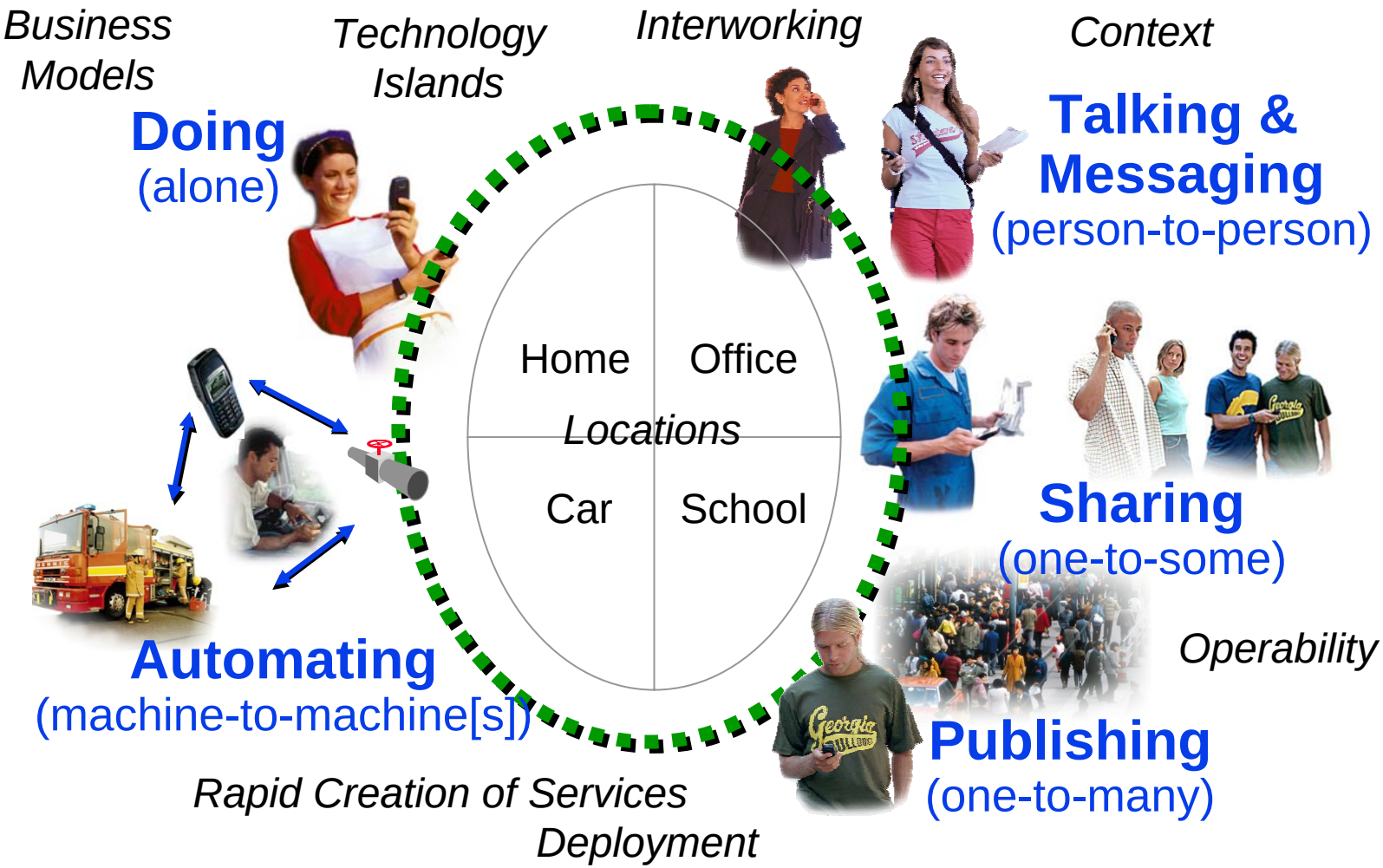
Adopted by WWRF

Work Areas

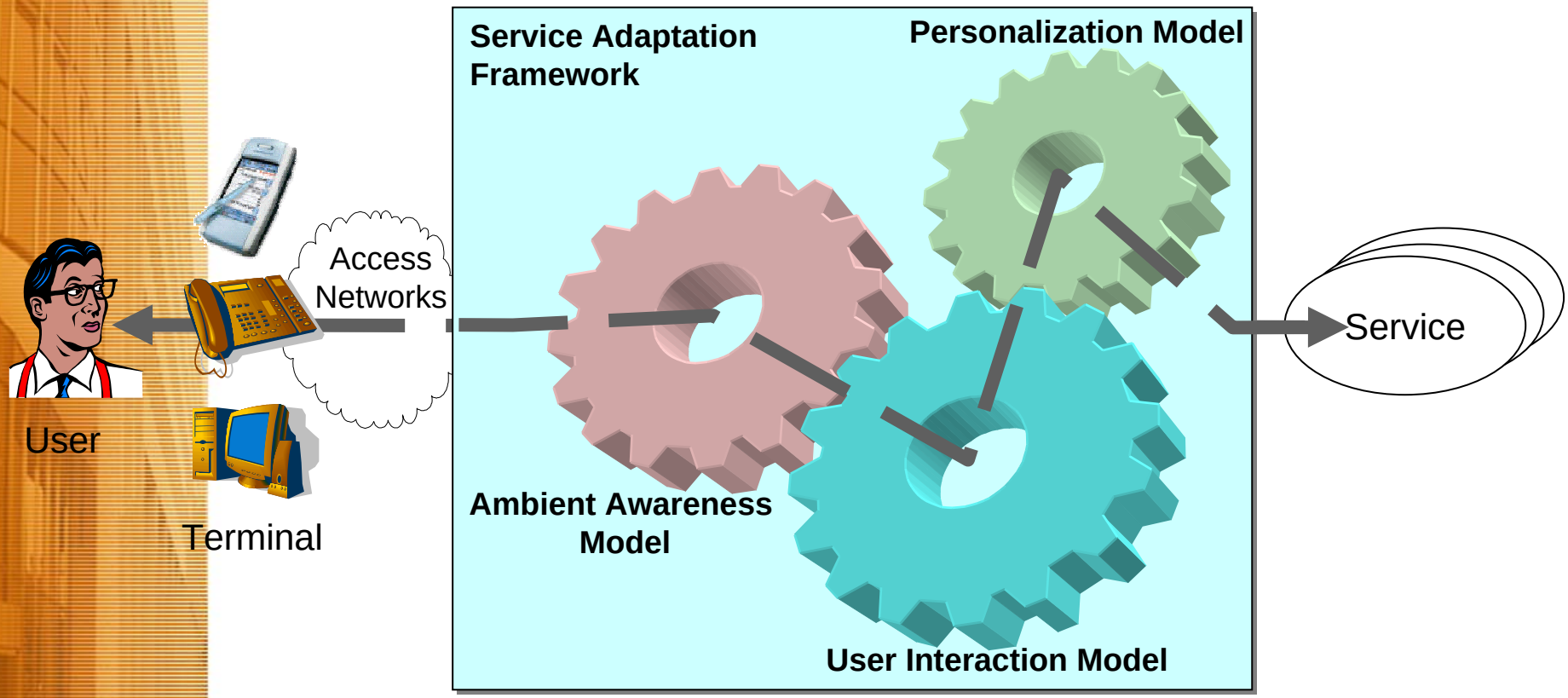
- Research and develop **new service frameworks** and **innovative new applications and services**
- Development of a **Mobile Middleware** consisting of the following building blocks:
  - Collaborative Objects, Personalization, Context-Awareness, Service Adaptation
- Network infrastructure containing **devices/sensor networks**



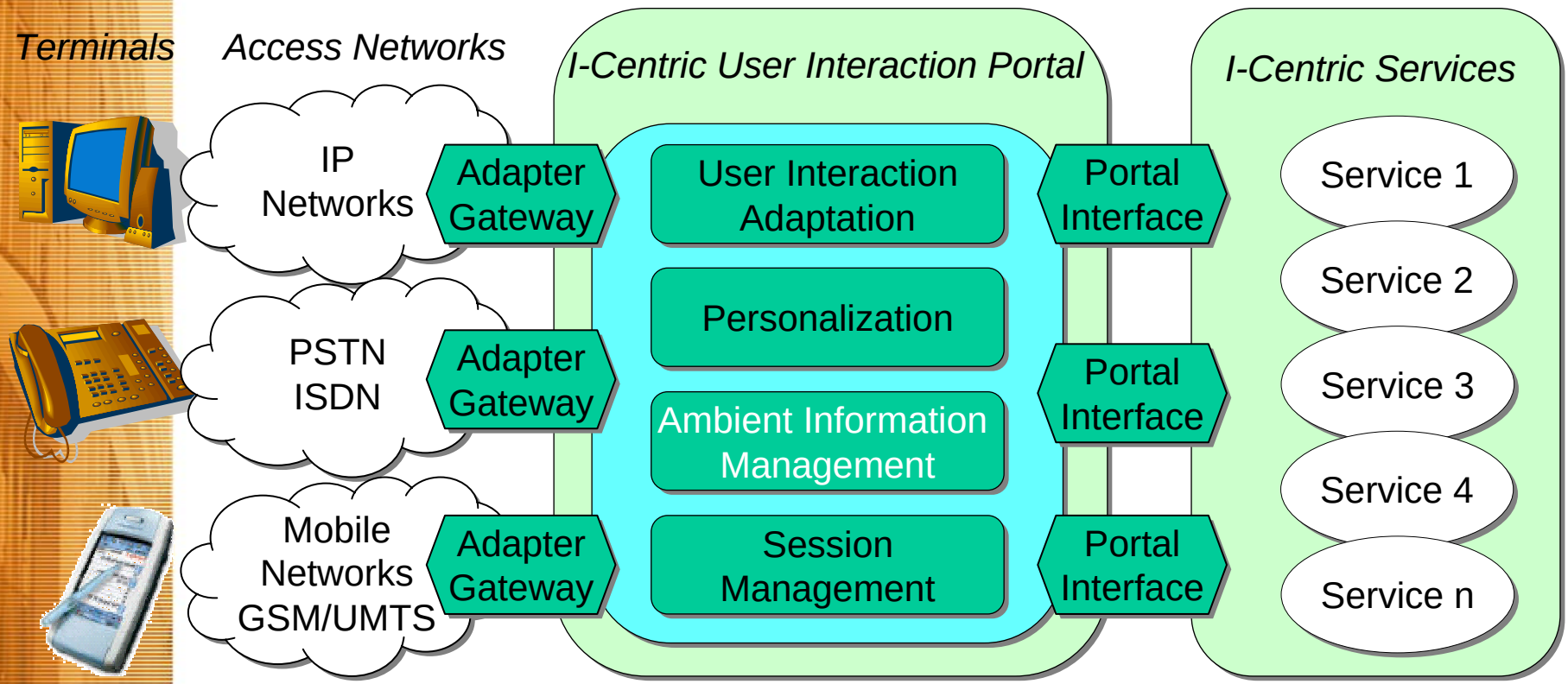
Complex Service Infrastructure



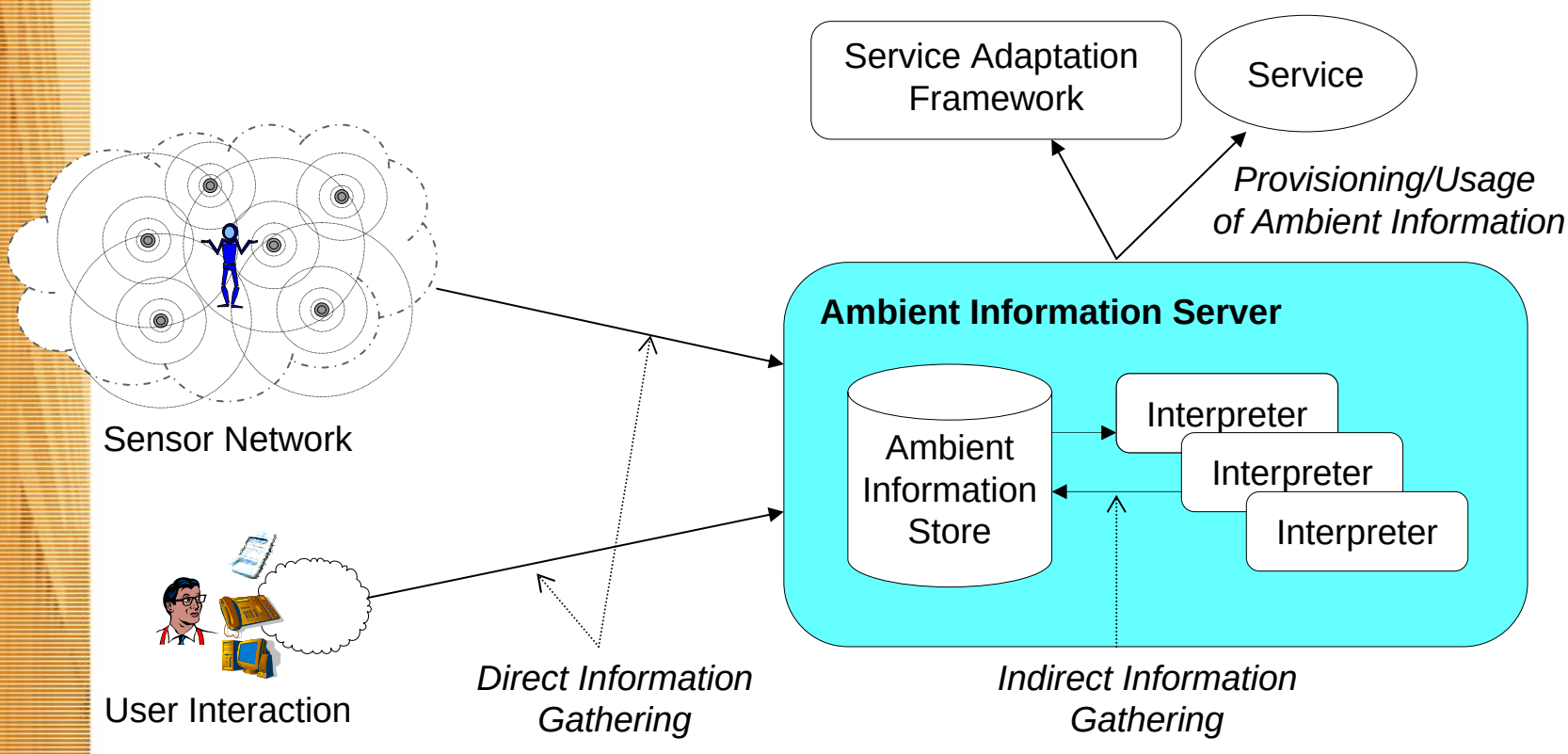
I-Centric User Interaction
Service Adaptation Framework



Portal Architecture

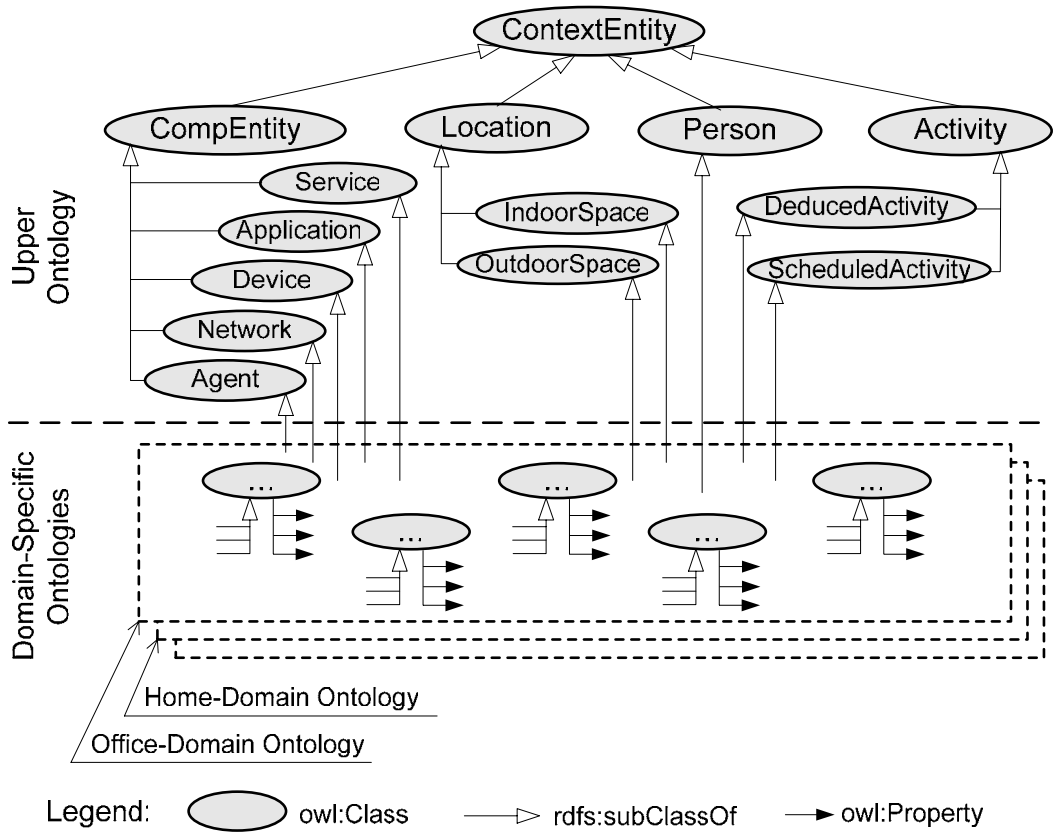


Gathering of Ambient Information



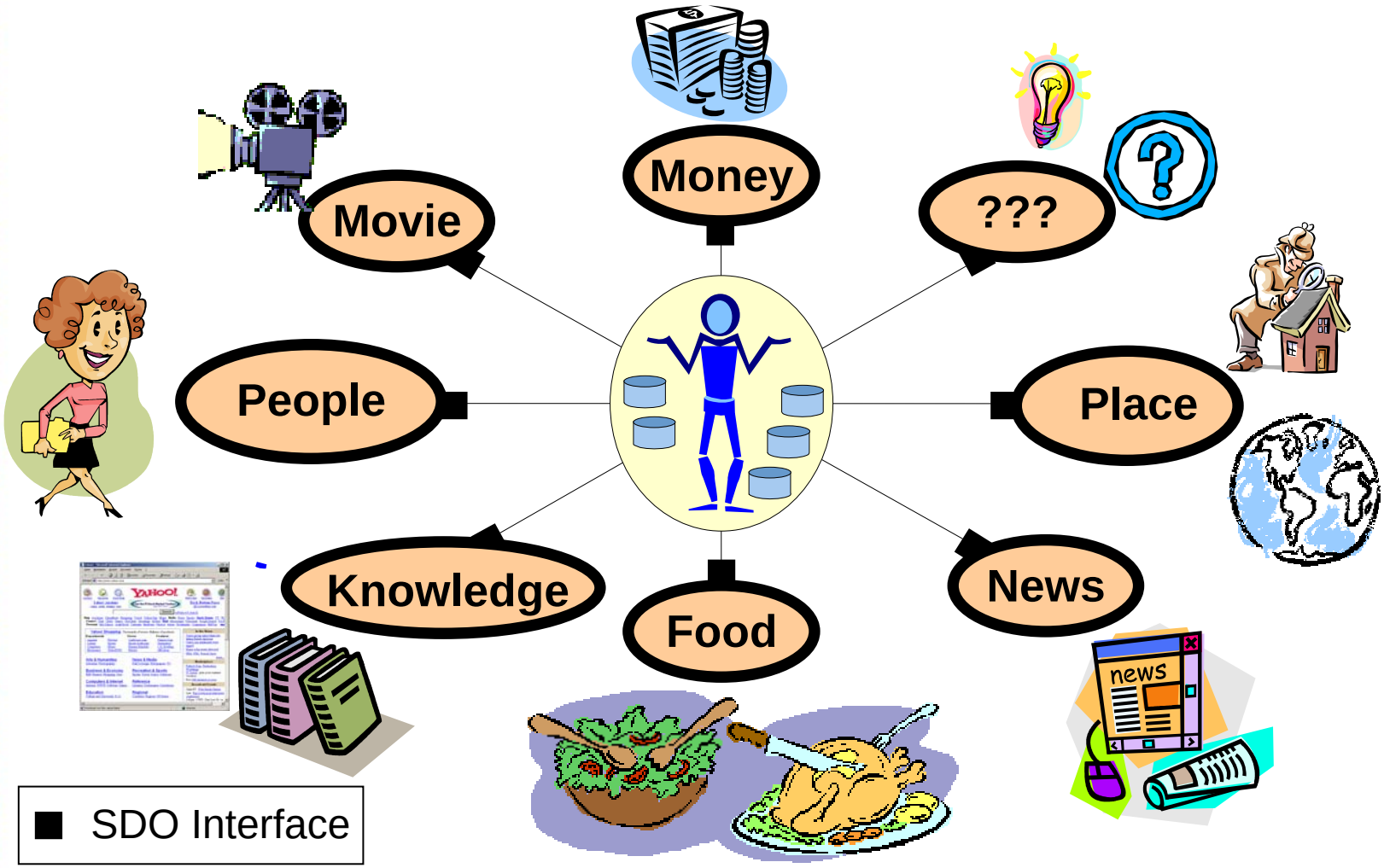
Context Modeling

- Resource Description Framework (RDF) provides data model specifications and XML-based serialization syntax
- Web Ontology Language (OWL) enables the definition of domain ontologies and sharing of domain vocabularies

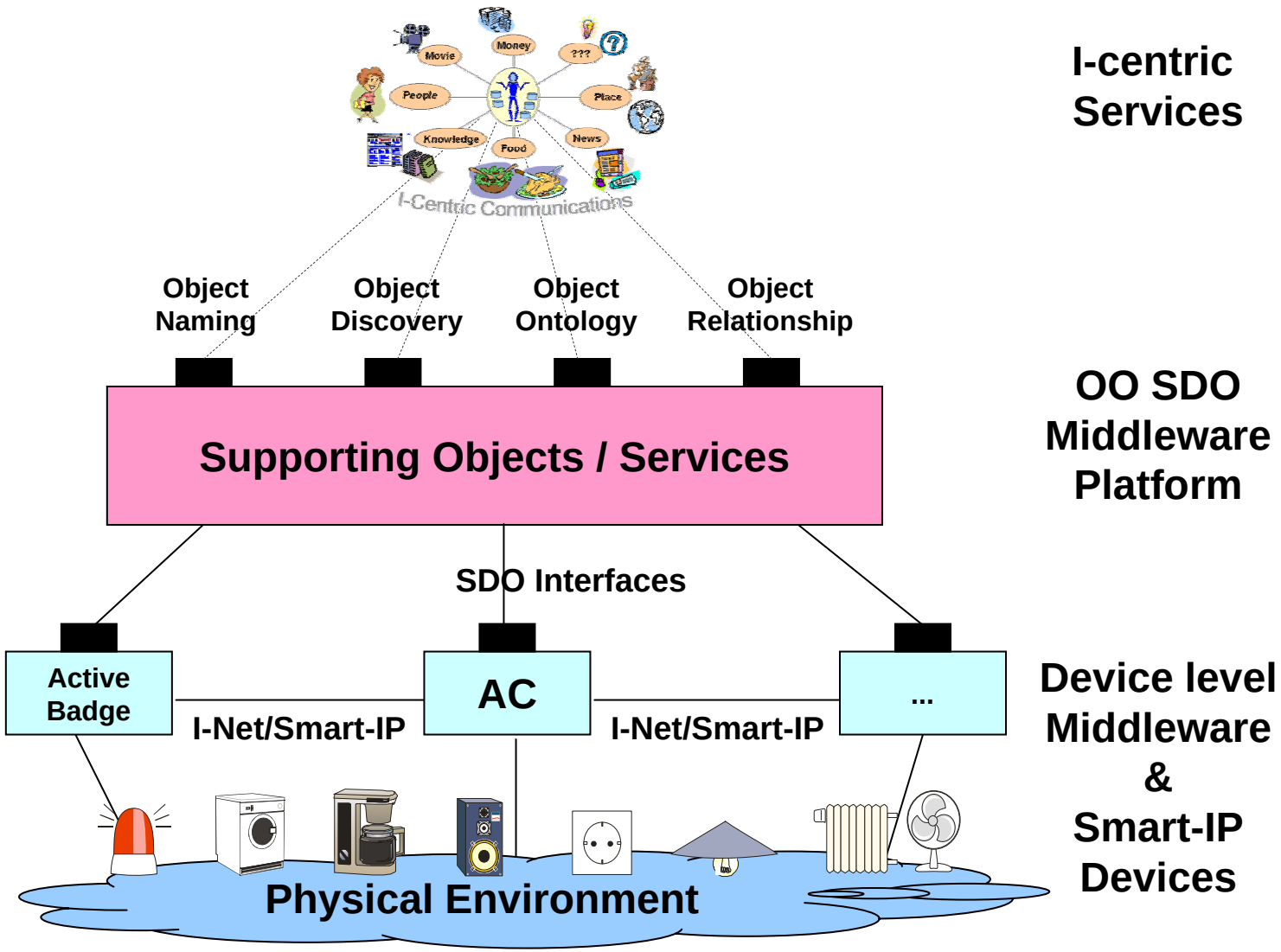


Building Block: Collaborative Objects

- Collaborative Objects
  - Can be Users, devices, real-world objects
  - Communication Systems for information exchange
  - Object abstraction middleware: Super Distributed Objects
  - Object ontological description and state maintenance


Money
Movie
???
People
Place
Knowledge
Food
News
news
SDO Interface

SDO towards Smart Environments

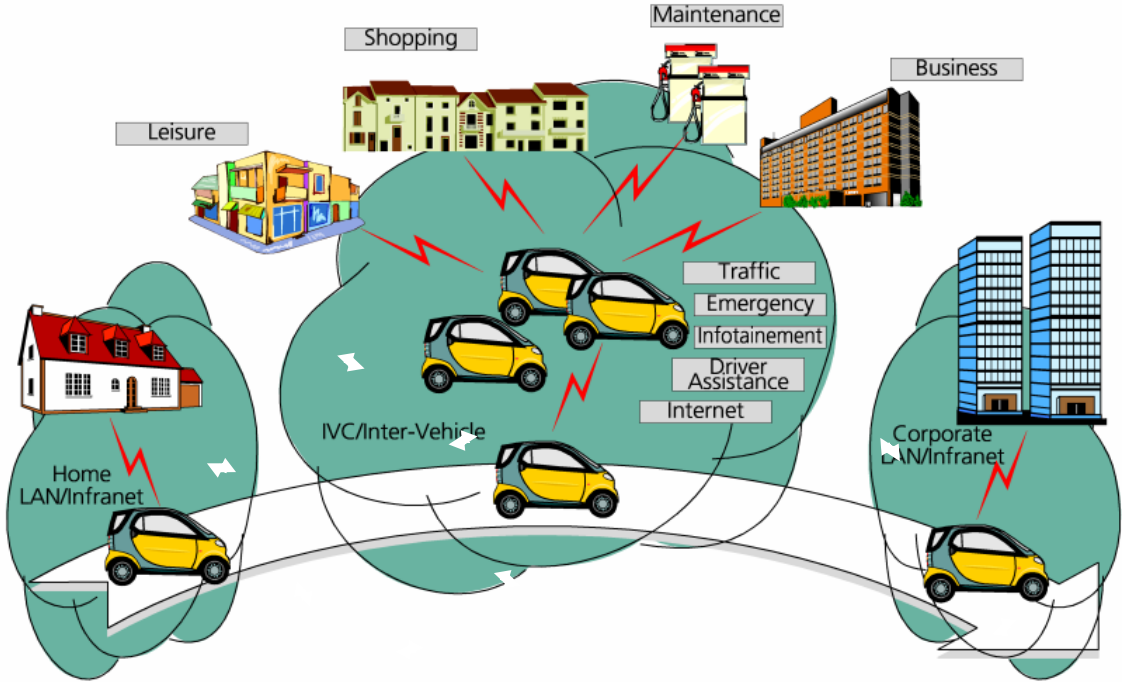


I-centric Services

OO SDO Middleware Platform

Device level Middleware & Smart-IP Devices

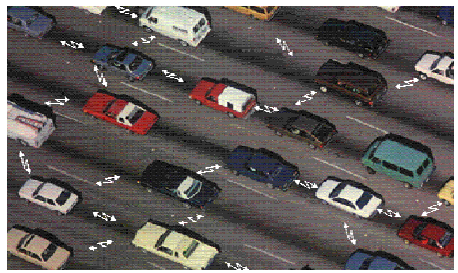
Seamless networking – Seamless services



Body Area Networks

Home Networks

Building Automation



Vehicular Networks

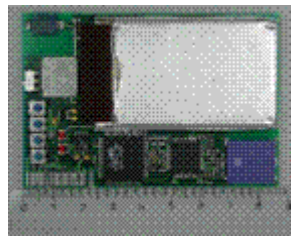
Device and protocol development

IP doorplate

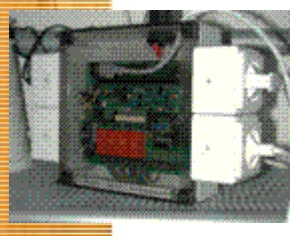
Various IP-enabled devices and Sensor network developments incl. device communication protocol

IP-enabled sensors

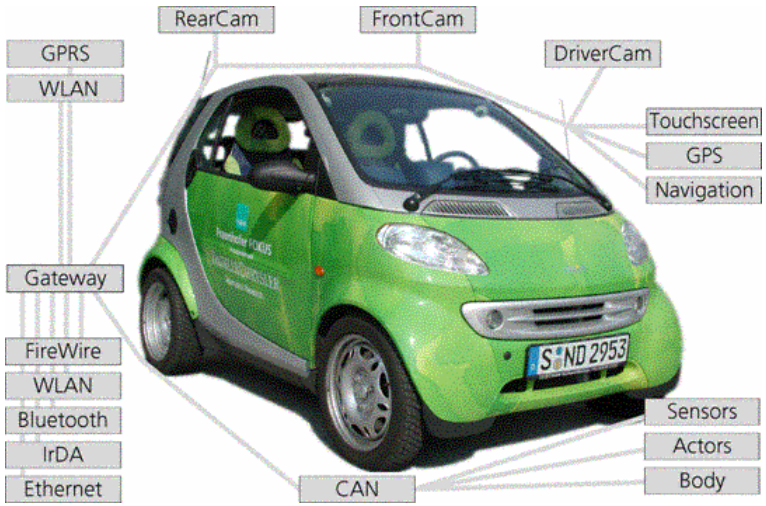
IP loudspeaker



Body Area Network Gateway (Bluetooth/868MHz)



IP power plug



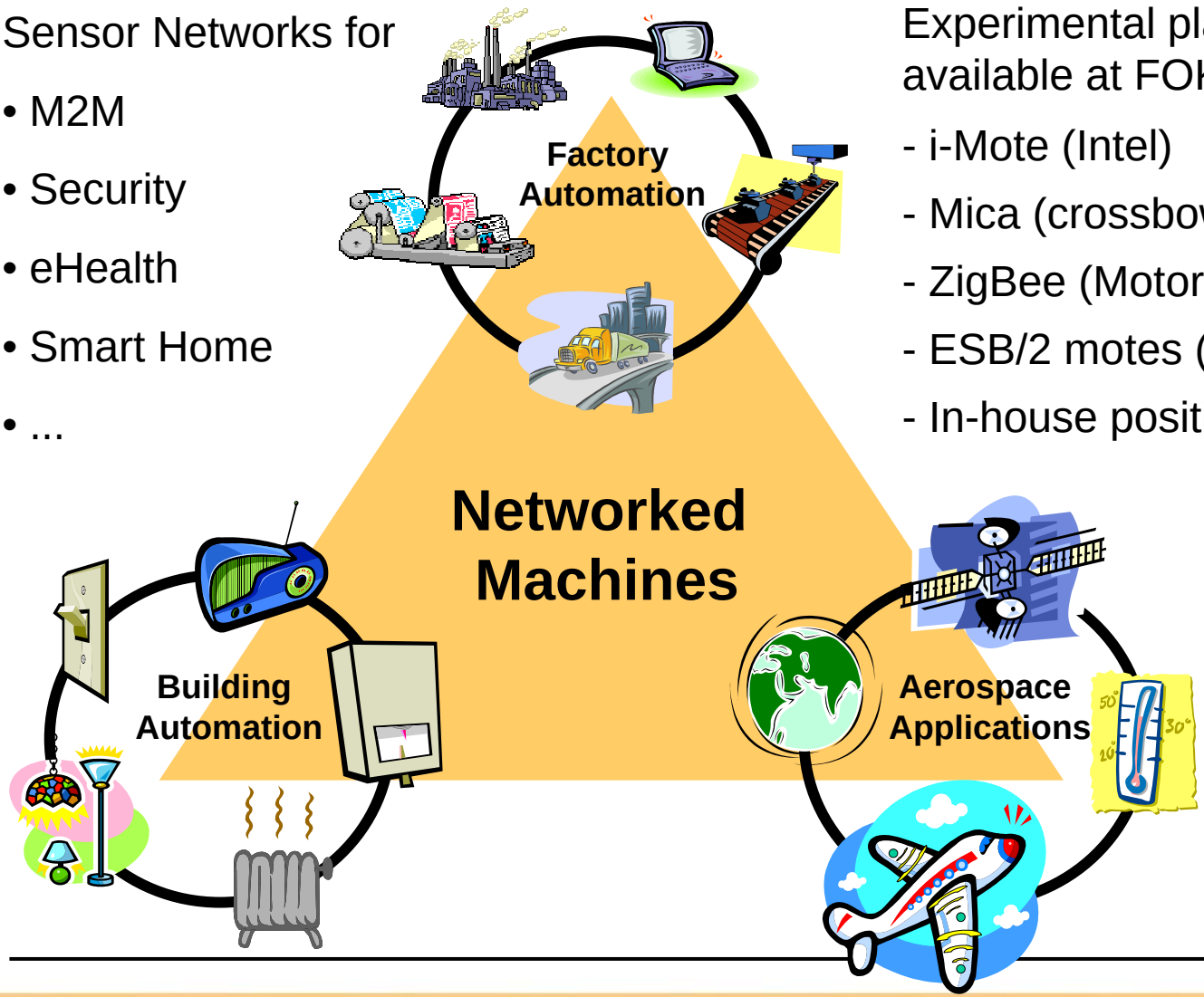
IP Smart

Active badge (IR/RF)

Application development for sensor networks

Sensor Networks for

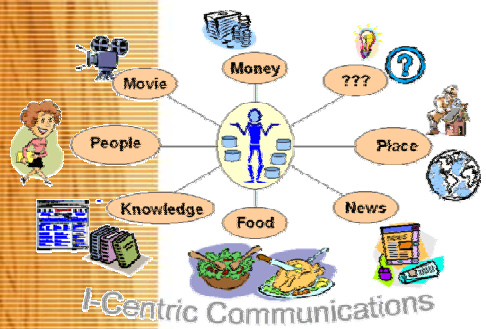
- M2M
- Security
- eHealth
- Smart Home
- ...



Experimental platform available at FOKUS:

- i-Mote (Intel)
- Mica (crossbow)
- ZigBee (Motorola)
- ESB/2 motes (FU Berlin)
- In-house positioning

Rule- and context-based services



Context-based Services

Rules & Profiles

Device Abstraction & Communication Middleware (UPnP, OSGi, i-Net, …)

Ubiquitous Portal Access





Mobile ↔ Car ↔ Desktop ↔ Public Terminals ↔ on TV at Home

- Long living service sessions → user aware portal keeps access state

- Seamless comm. (multimodal) → various devices – various services

- Home access & control (e.g.: mobile home access via DSL)
  - Set-top Boxes, HAVI, Smart-IP

Mobile Personal Assistant Services

Personal Environment Control
(Smart-IP: TV, VCR, fridge, curtain, light)

Personalized Information Services
(e.g. maps, cinema, hotel, shops, flights)

Personal secretary
(cares about all appointments & incoming information, PAM)

Personal Information Management
(Calendar, documents, contacts, notes, messages)

e-Government
(e.g. taxes, passports, real estate)

- Ubiquitous access & delivery of information → **one device – various services**
- Integrated solution (one-stop-shopping) → one portal
- Context aware personalized usage of **integrated** services

Thank you!

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Questions?

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