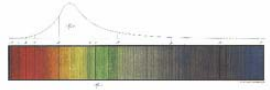
There is no reason for any individual
to have a computer in his home

Ken Olsen, President, Digital Equipment (1977)

Joseph von Fraunhofer (1787 - 1826)

Fraunhofer-Gesellschaft

discovery of "Fraunhofer Lines" in the sun spectrum



→ e.g.: Innovation Award 2004 of the German Federal President for Electric Biochip Technology

new methods of lens processing

→ e.g.: 2 patent applications each working day

Head of Royal Glass Factory

→ e.g.: ~ €350 million revenues from industry (about 4000 contracts) p. a.

ZV-A2/ May 05

Fraunhofer Gesellschaft

Fraunhofer Profile – Figures 2005

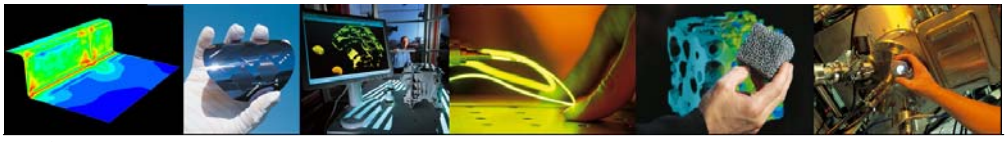
58 Institutes

12 600 employees

€1 billion research budget

7 Alliances

- Information and Communication Technology
- Life Sciences
- Materials and Components
- Microelectronics
- Production
- Surface Technology and Photonics



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Fraunhofer Gesellschaft

Fraunhofer-Institutes in Germany

58 Institutes at
approx. 40 locations

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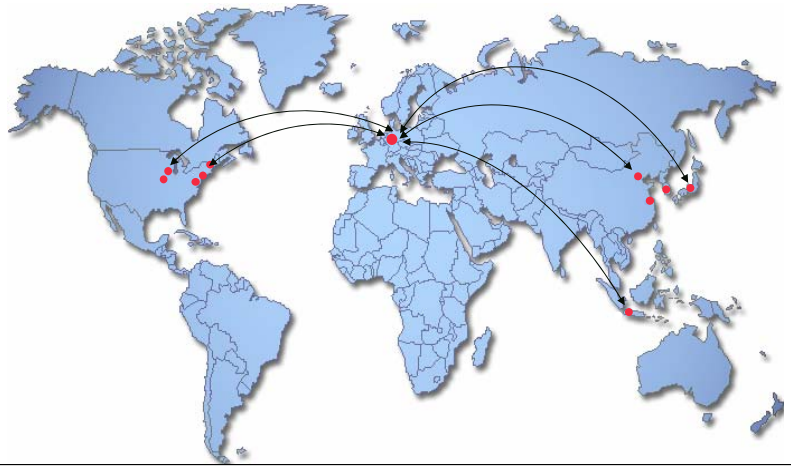
Fraunhofer Gesellschaft

Fraunhofer Research Units Worldwide



ZV-A2/ Sept 04

Fraunhofer Gesellschaft

Fraunhofer ICT-Group

Founded in 2001, the Fraunhofer ICT Group represents the strategic alliance of those Fraunhofer Institutes which are mainly engaged in the research area of information and communication technology.

Goals of the Fraunhofer ICT-Group

- Establish the ICT-Group as one of the **leading research groups worldwide**
- Develop **visions** and **strategies** for basic, prospective, and applied **ICT research**
- Increase **synergy effects** among institutes by joint projects
- Initiate **middle- and long-term R&D Projects**
- Support the ICT institutes with **strategies, technology transfer, marketing, and public relations**

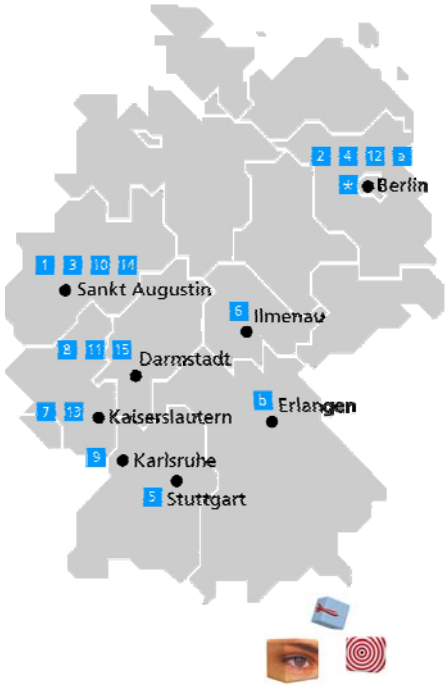
Fraunhofer Gruppe Informations- und Kommunikationstechnik

Fraunhofer-ICT-Group – Member Institutes

1 **Fraunhofer AIS**, Autonomous Intelligent Systems
2 **Fraunhofer FIRST**, Computer Architecture and Software Technology
3 **Fraunhofer FIT**, Applied Information Technology
4 **Fraunhofer FOKUS**, Open Communication Systems
5 **Fraunhofer IAO**, Industrial Engineering
6 **Fraunhofer IDMT,** Digital Media Technology
7 **Fraunhofer IESE**, Experimental Software Engineering
8 **Fraunhofer IGD**, Computer Graphics
9 **Fraunhofer IITB**, Information- and Data-Processing
10 **Fraunhofer IMK**, Media Communication
11 **Fraunhofer IPSI**, Integrated Publication- and Information Systems
12 **Fraunhofer ISST**, Software- and System Techology
13 **Fraunhofer ITWM**, Industrial Mathematics
14 **Fraunhofer SCAI**, Algorithms and Scientific Computing
15 **Fraunhofer SIT**, Secure Information Technology

Guest Institutes within ICT-Gruppe
a **Fraunhofer HHI**, Telecommunication, Heinrich Hertz
b **Fraunhofer IIS**, Integrated Circuits

* **ICT-Business Office**



Fraunhofer Gruppe Informations- und Kommunikationstechnik

Fraunhofer ICT-Group – Facts and Figures

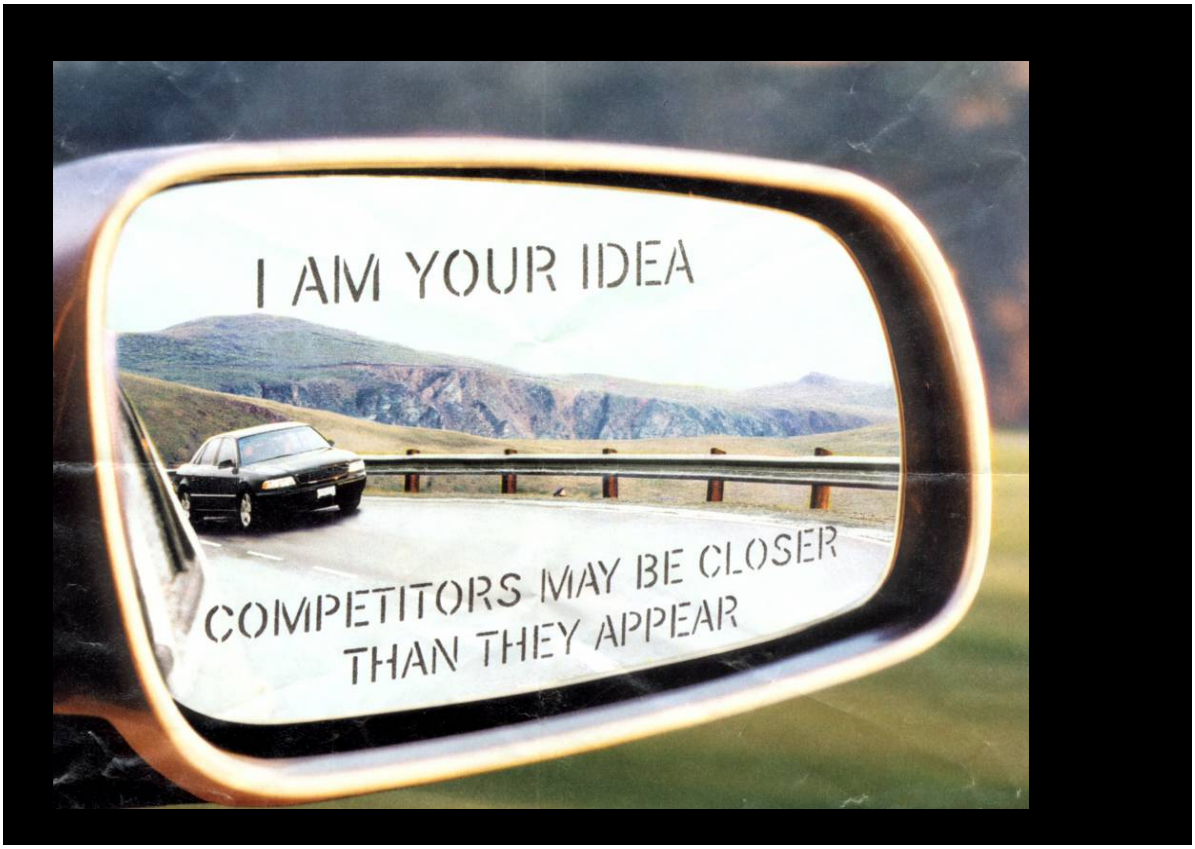
Chairman
Prof. Dr.-Ing. José L. Encarnação

Vice Chairman
Prof. Dr. Ulrich Trottenberg

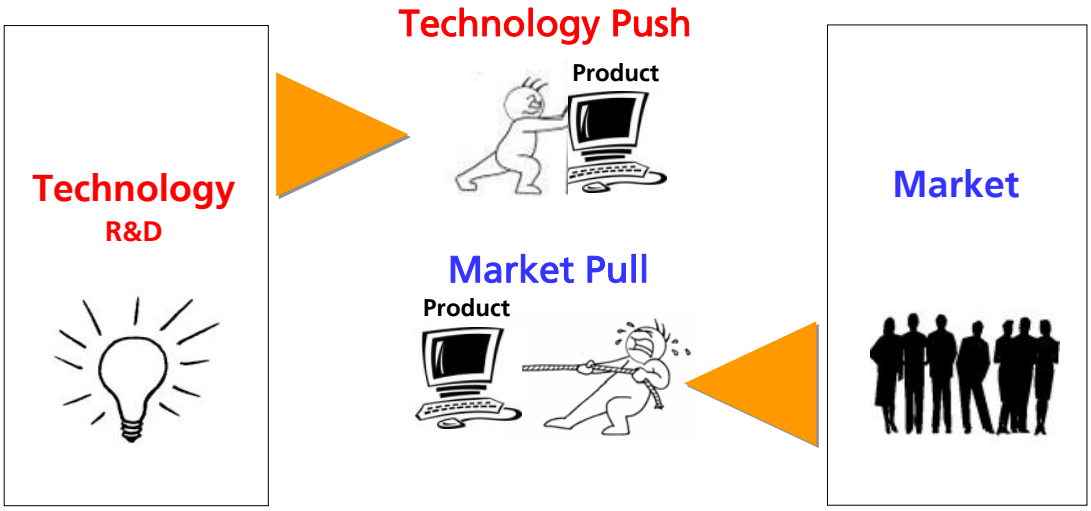
Managing Director
Dipl. Inform. Boris Groth

- 15 Member Institutes
- 2 Associated Member Institutes
- 10 Locations in Germany
- approx. Staff of 3000 (HC)
- Budget of approx. 176 Mio. €
- Business Office in Berlin-Mitte

Fraunhofer Gruppe Informations- und Kommunikationstechnik



Innovations between market and technology



Often both effects act together!

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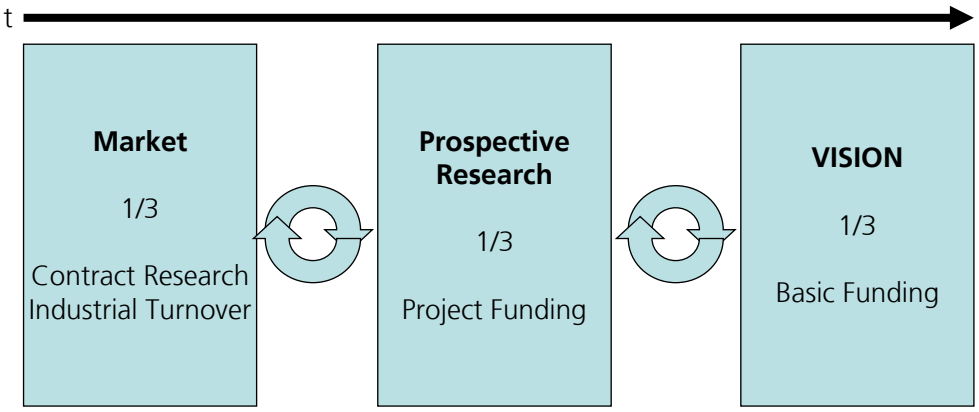
If Akio Morita from Sony would not have insisted on marketing and selling obviously weird things, we would not be able to carry a Walkman today.

Innovations between market and technology

Technology R&D	Technology Radar Technology Scouts Technology Roadmap Innovation Council CRM Lead-User Customer Summit Technology Academy	Market

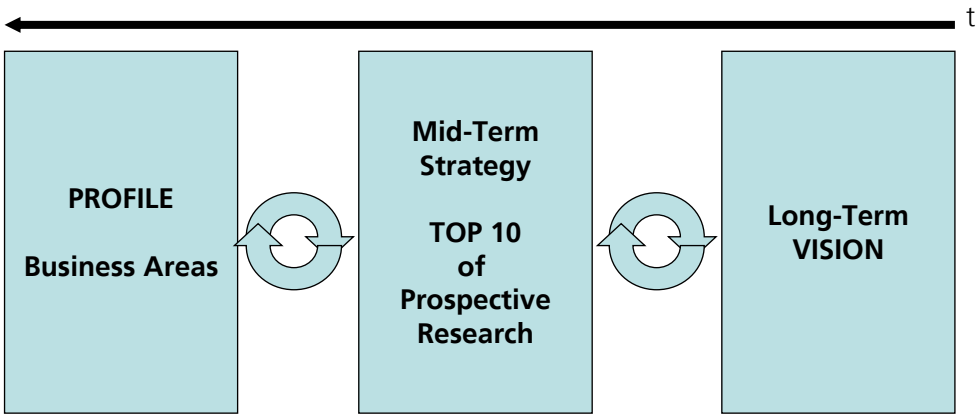
Fraunhofer Gesellschaft

The Fraunhofer Model at a Glance



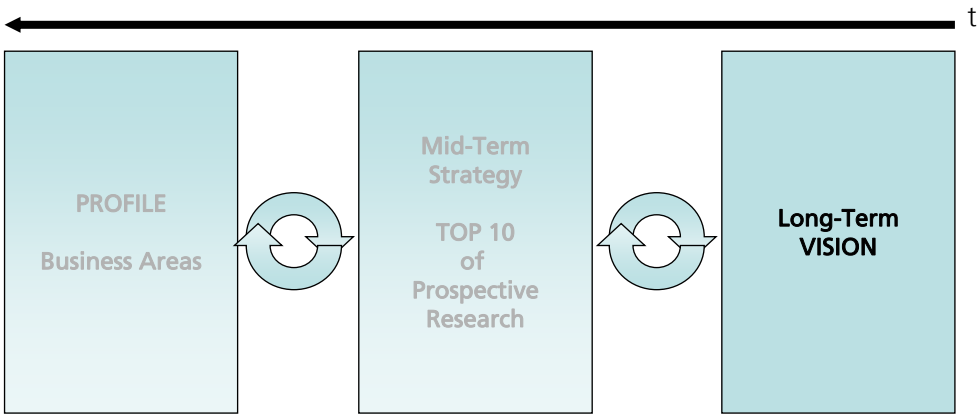
Fraunhofer Gruppe Informations- und Kommunikationstechnik

Strategic Development of Research Topics and Time Scale



Fraunhofer Gruppe Informations- und Kommunikationstechnik

Strategic Development of Research Topics and Time Scale



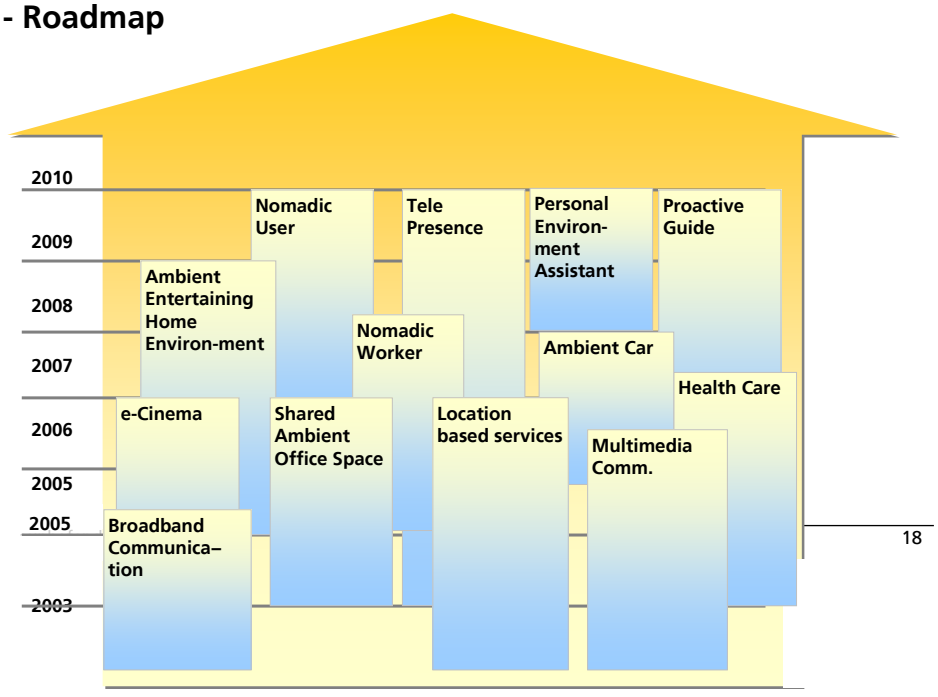
Fraunhofer Gruppe Informations- und Kommunikationstechnik

Leitvision 2012 – „Visionen der IuK“

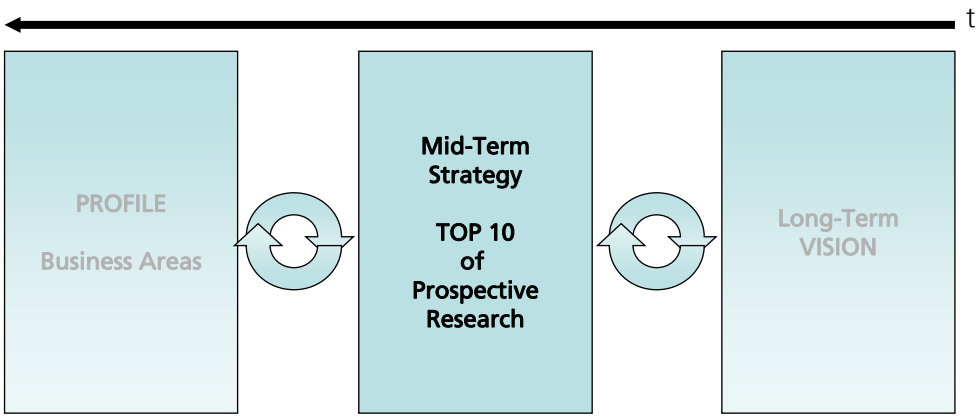
»Lösungen für eine Gesellschaft und Wirtschaft im Wandel«

- e-Learning: **Zugang zu Lerninhalten und organisiertem Wissen für jedermann**
- Medizin: **Verbesserte medizinische Behandlung und Betreuung durch IuK Infrastrukturen**
- Verkehr: **Die mobile Gesellschaft**
- Freizeit und Kultur: **Freizeit neu erleben**
- Katastrophenmanagement: **Verhindern, Erkennen und Bekämpfen von Katastrophen**
- e-Business: **Unternehmen und Prozesse flexibel vernetzen**
- eGovernment: **Behörden, Verwaltungen und Bürger vernetzen**
- Produktion: **Die Einheit von Logistik und IuK-Technologie**
- Simulierte Realität: **Die Zukunft berechnen**
- Ambient Intelligence: **Allgegenwärtige unterstützende Technik**
- Sicherheit: **IT-Infrastrukturen zur Gewährleistung von Geschäftprozessen sichern**
- Usability: **Technik benutzbar gestalten**
- Next Generation Internet: **Kommunikationssysteme und Dienste für eine ganzheitliche Informationsversorgung**
- Grid Computing: **Ressourcen und Services aus der Steckdose**

AmI - Roadmap



Strategic Development of Research Topics and Time Scale



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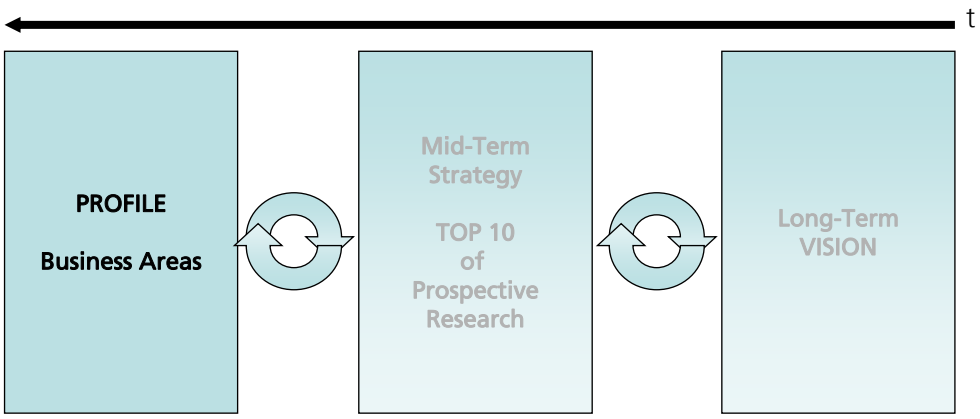
Top 10 of Prospective Research

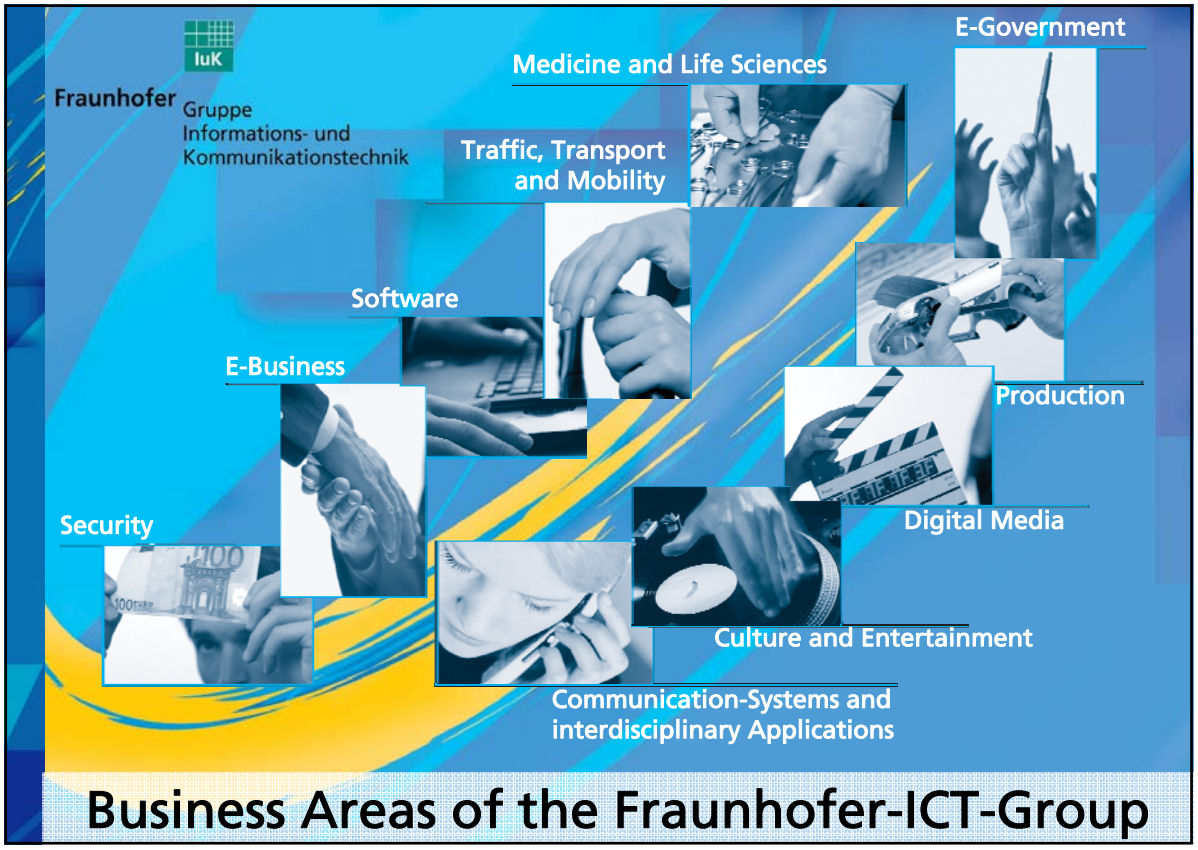
- IT-Security and Security by IT
- Usability Engineering
- Ambient Intelligence
- Games and Edutainment; Digital Entertainment
- Data Analysis and Information Extraction
- IT for Production and Engineering
- Simulated Reality
- Software Engineering
- Next Generation Networks
- Grid Computing

Fraunhofer Gruppe Informations- und Kommunikationstechnik

Strategic Development of Research Topics and Time Scale



Fraunhofer Gruppe Informations- und Kommunikationstechnik



Business Areas of the Fraunhofer-ICT-Group

Signposts to tomorrow's markets
Researching with Fraunhofer today for market success tomorrow

1. Internet of things
   Parcels deliver themselves
   The Internet is a self-organizing distribution system. If the same principles are applied to real merchandise, each parcel can find its own way to the customer.

2. Smart products and environments
   Invisible helpers at hand
   Electronics create a helping environment: Sensors and microchips locate devices, control service robots, remind us of important things to do and relieve us of burdensome tasks..

3. Micro power engineering
   Mobile power supplies
   Mobile electronic devices such as cell phones and digital cameras have become an essential ingredient in our lives: Miniaturized fuel cells will keep them powered up for longer.

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Signposts to tomorrow's markets
Researching with Fraunhofer today for market success tomorrow

4. Adaptronic
   Self-regulating structures
   Adaptronic systems actively dampen vibrations: Machines and cars run quietly when noise is cut down or shut out.

5. Simulated reality: Materials, products, processes
   Future worlds inside the computer
   The gap is closing between ideas and reality: Modern simulation methods allow the properties of components and other products to be tested as early as the design stage.

6. Human-machine interaction
   Putting an end to button-pressing
   Interaction between people and machines is growing easier and more intuitive. Design engineers and planners can move around in virtual reality systems without the distraction of complicated input devices.

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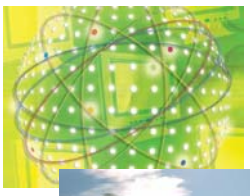
Signposts to tomorrow's markets
Researching with Fraunhofer today for market success tomorrow



7. Grid-Computing
Link up wherever you like
People are more productive when they cooperate – and the same applies to computers. Standard PCs linked together to form a grid are even capable of outperforming supercomputers.

8. Integrated lightweight construction systems
Weight-loss diet for four-wheel patients
Lightweight construction methods bring immense benefits to vehicle manufacturing: When less mass needs to be moved, energy consumption is reduced accordingly.

9. White biotechnology
Nature's own chemical plant
Plants produce useful raw materials: Through genetic engineering, algae and higher forms of plant life can be encouraged to manufacture valuable drugs and chemicals of remarkably high quality.

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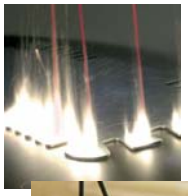
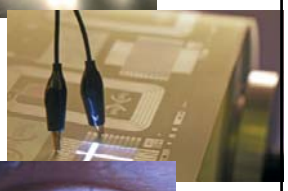
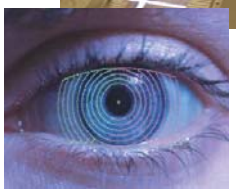
Signposts to tomorrow's markets
Researching with Fraunhofer today for market success tomorrow







10. Tailored Light
Using light as a tool
The laser is steadily being adopted for many new industrial applications. The use of special mirrors to guide the beam with great precision speeds up the welding of complex parts and optimizes the manufacturing process.

11. Polytronics
Printed circuits – luminescent wallpaper
Conductive and luminescent polymers are creating new perspectives for the design of innovative products such as low-cost electronic labels, roll-up displays and smart clothing with integrated sensors.

12. Security
The reassuring face of high tech
Many security technologies are based on unique attributes that allow a person to be identified. Biometric methods have proven to be a highly reliable solution..

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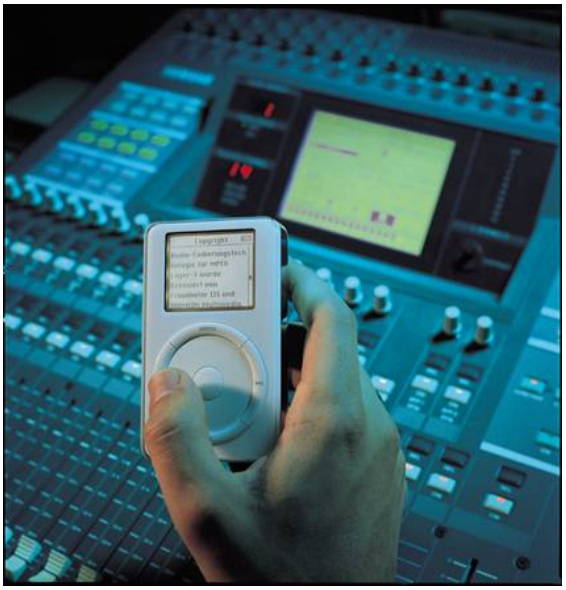
MP3 – a Fraunhofer innovation

This abbreviation stands for a technology that revolutionized the music industry: it enables music to be downloaded from the Internet. It works by compressing the audio data – with no audible loss of quality.



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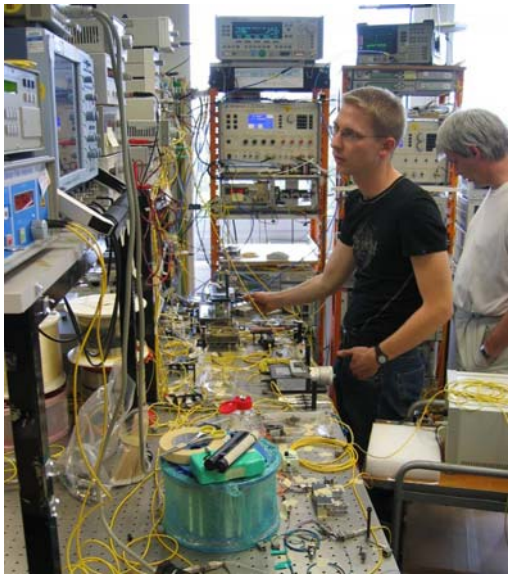
Fiber-optic network sets world record

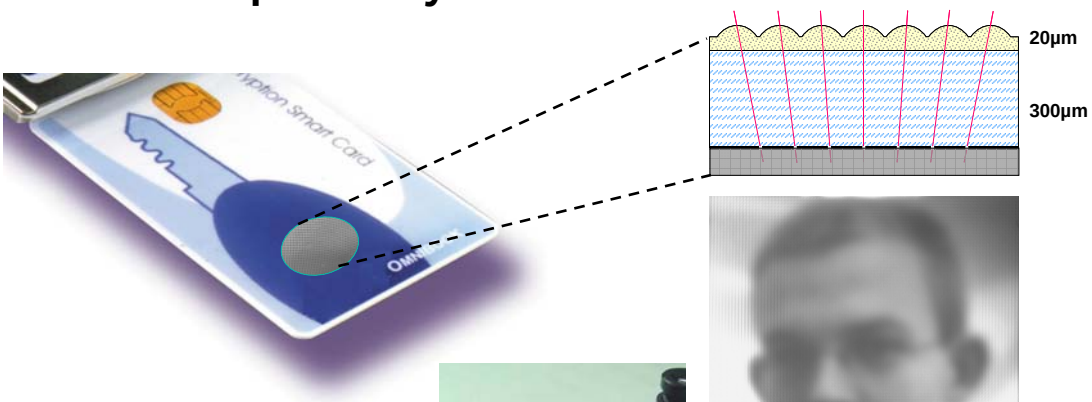
As Internet traffic grows exponentially, so high-speed data transmission becomes crucial. Fraunhofer researchers are now using new technology that supports speeds of **2.56 terabits per second** over fiber-optic cables - the equivalent of **60 DVDs**.



Source: Fraunhofer HHI

Fraunhofer Gesellschaft

Thinnest compound-eye camera in the world



The focal length of a lens means that a camera has to have a certain thickness – or so we might think. Insect eyes show that this need not be the case: A camera chip based on the compound-eye principle can be used for person recognition and is as thin as paper.

Source: Fraunhofer IOF

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Ambient Intelligence – Electronic Assistance

Things of daily life will become intelligent.
Actors, sensors and software are integrated. Ad hoc networks will be generated.

Virtual information

Special glasses with additional information for production and maintenance

Shopping assistant

Smart labels (RFID) for product information and logistics

Smart House

Integrated networks for the management of buildings; comfortable housing, security

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Social Trends

- **Demographic Aspects**
- Less children per family in some countries
- Growing number of elder but vital people

- **Technology Acceptance**
- Youngsters have grown up with ICT
- More trust and understanding
- Better usability
- Improved utility

- **Brand loyalty**
- Technology hypes by marketing
- Community building

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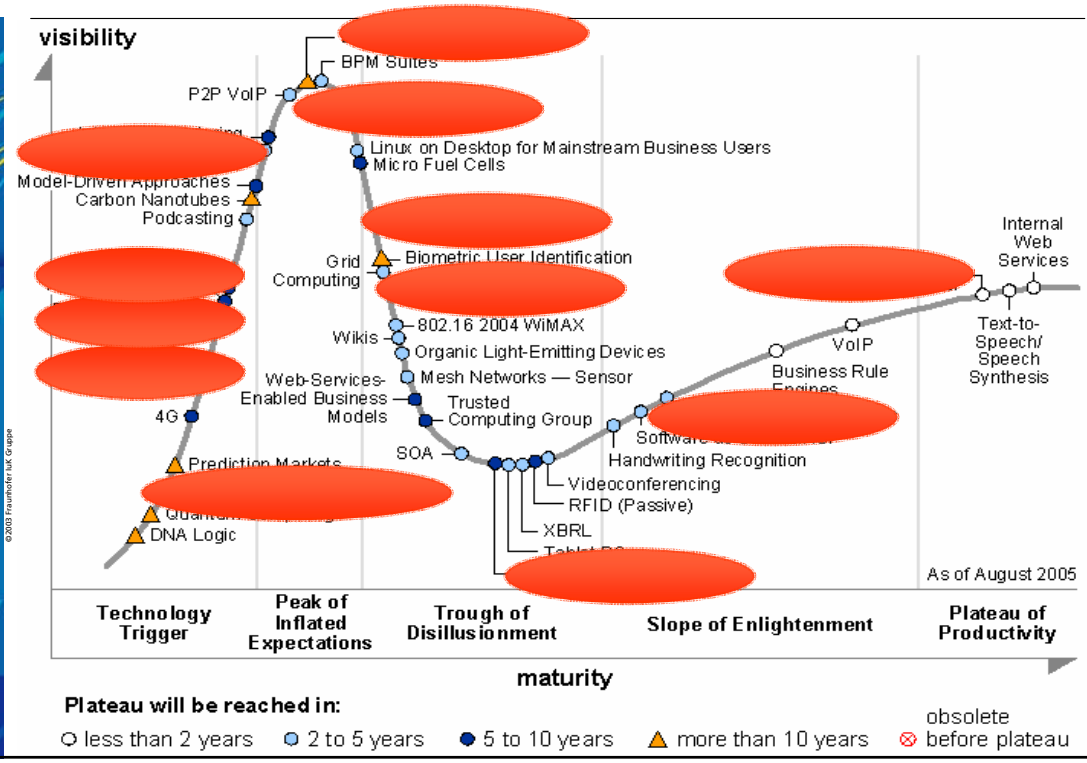
Technology Trends and Hype Cycles



Future Technology Trends

- **Media Convergence**
- From linear broadcast to interactive individual broadband
- Traditional to new (e.g. e-Paper)

- **Device Convergence**
- Multimedia Home Appliances (TV, Media, Game, e-Business, Information, …)
- Multimedia Mobile Appliances (Mobile TV, …)

- **Always on**
- Always online
- Plug and play / Instant coupling

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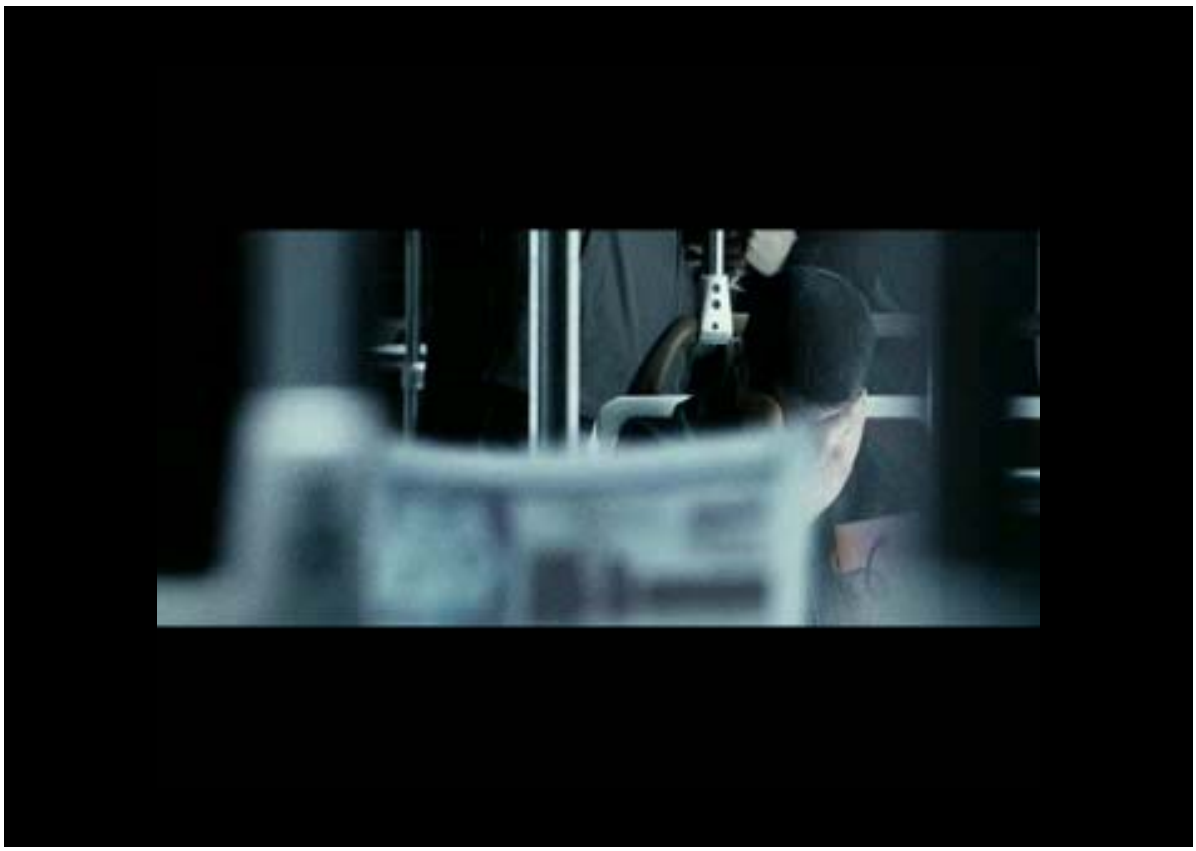
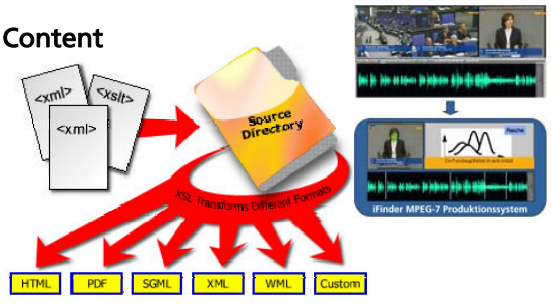
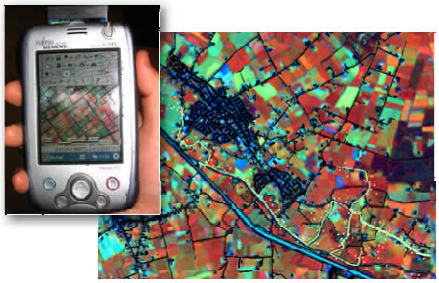


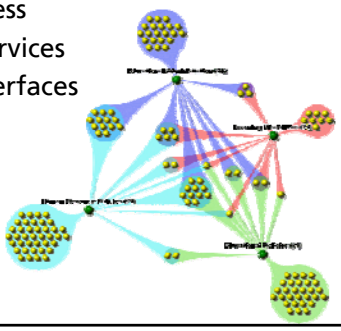
Future Technology Trends

- **Crossmedia Information Services and Content**
- Single Source Publishing
- Content Syndication
- Automatic content generation
- Automatic content annotation



- **Intelligent Personalized Services**
- User Profiling
- Context awareness
- Situation awareness
- Location based services
- Adaptive user interfaces
- Semantic Web

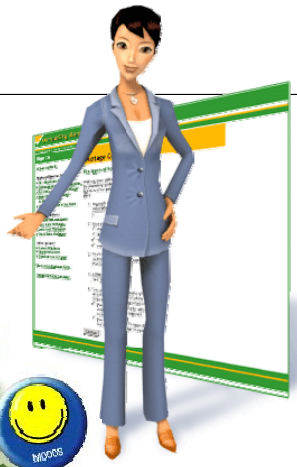


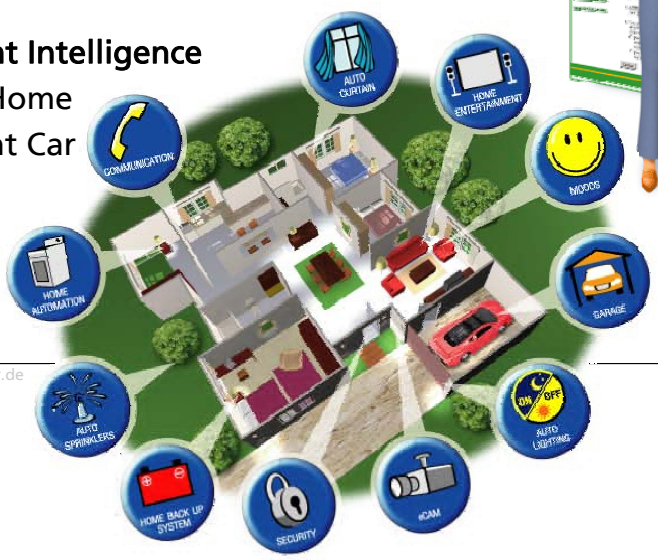


Future Technology Trends

- **Adaptive Intelligent User Interfaces**
- Speech control
- Intelligent virtual characters

- **Ambient Intelligence**
- Smart Home
- Ambient Car





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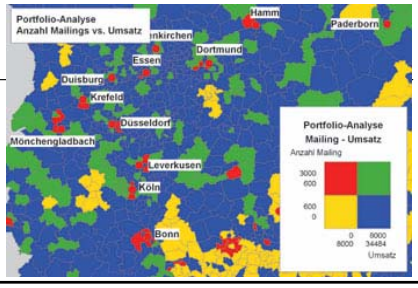
Future Technology Trends

- **Individual Customer Retention**
- Customer tracking
- Customer profiling
- Product2Customer mapping
- Fraud detection
- Customer behaviour analysis
- Customer behaviour prediction
- Individual advertisement

- **Detailed Market Analysis**
- Geo information systems
- Intelligent data analysis
- Data-Mining



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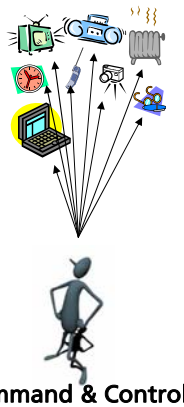
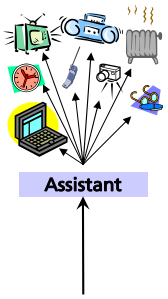
To make AmI happen we need

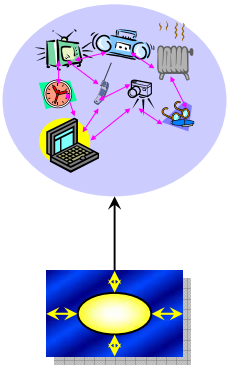
- Vanish from thought
- Coherence



Command & Control by User



Command & Control by Central Component



Command & Control by Self-Organization

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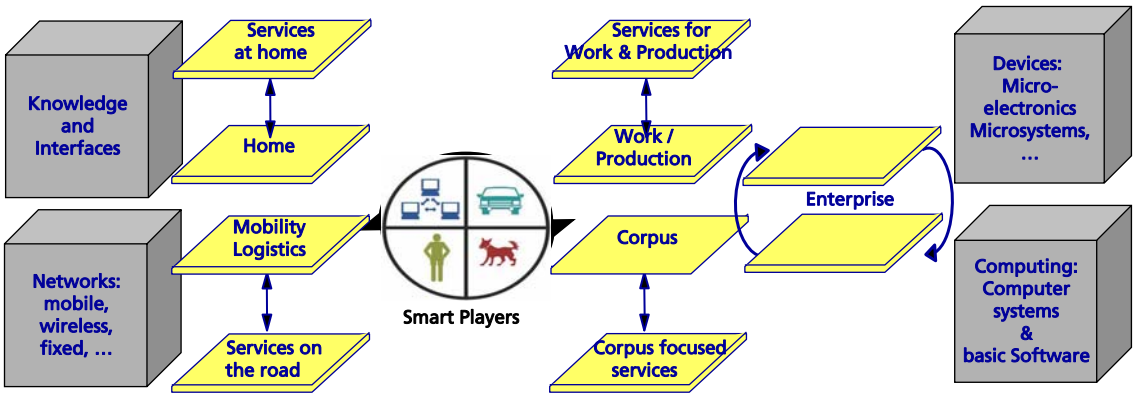
"Goal-based interaction"

Fraunhofer Gruppe Informations- und Kommunikationstechnik

AmI Environment Classes



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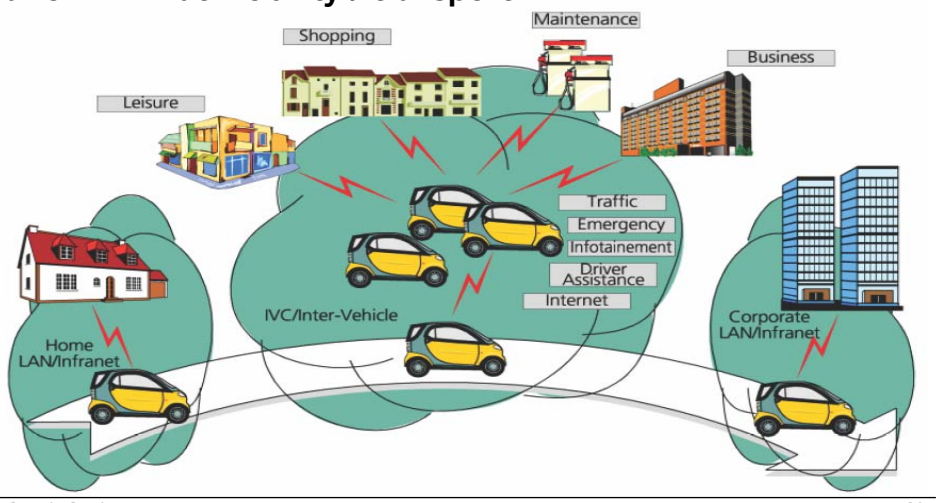
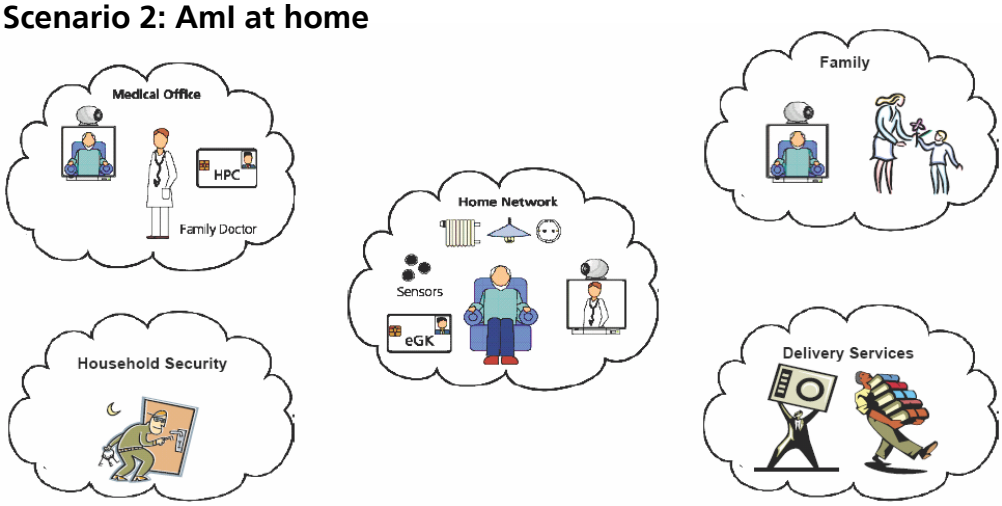
Scenario 1: AmI at mobility / transport



Fraunhofer Gruppe Informations- und Kommunikationstechnik

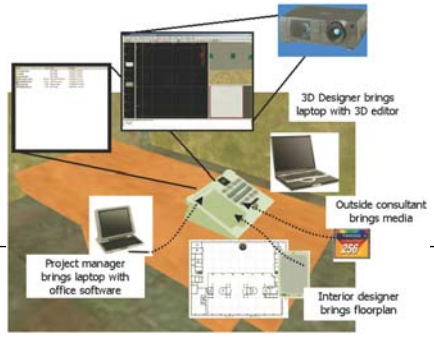
Scenario 2: AmI at home



Fraunhofer Gruppe Informations- und Kommunikationstechnik

Scenario 3: AmI at work / office

- distributed cooperative engineering
  - situation and context awareness
- pervasive cooperation
  - seamless media integration
- presence & process awareness



- Integration of devices
  - Service integration

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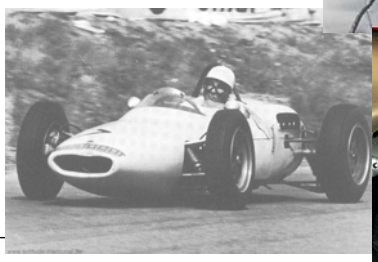
Thank you very much for your attention

If everything is under control you are just not driving fast enough.

Stirling Moss
(Rennfahrer, geb. 1929)



Fraunhofer Gruppe Informations- und Kommunikationstechnik