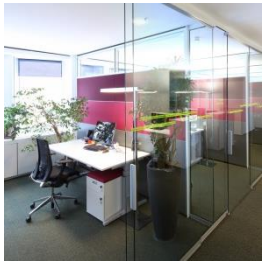




FRAUNHOFER-INHAUS-CENTER







Intelligent room and building systems

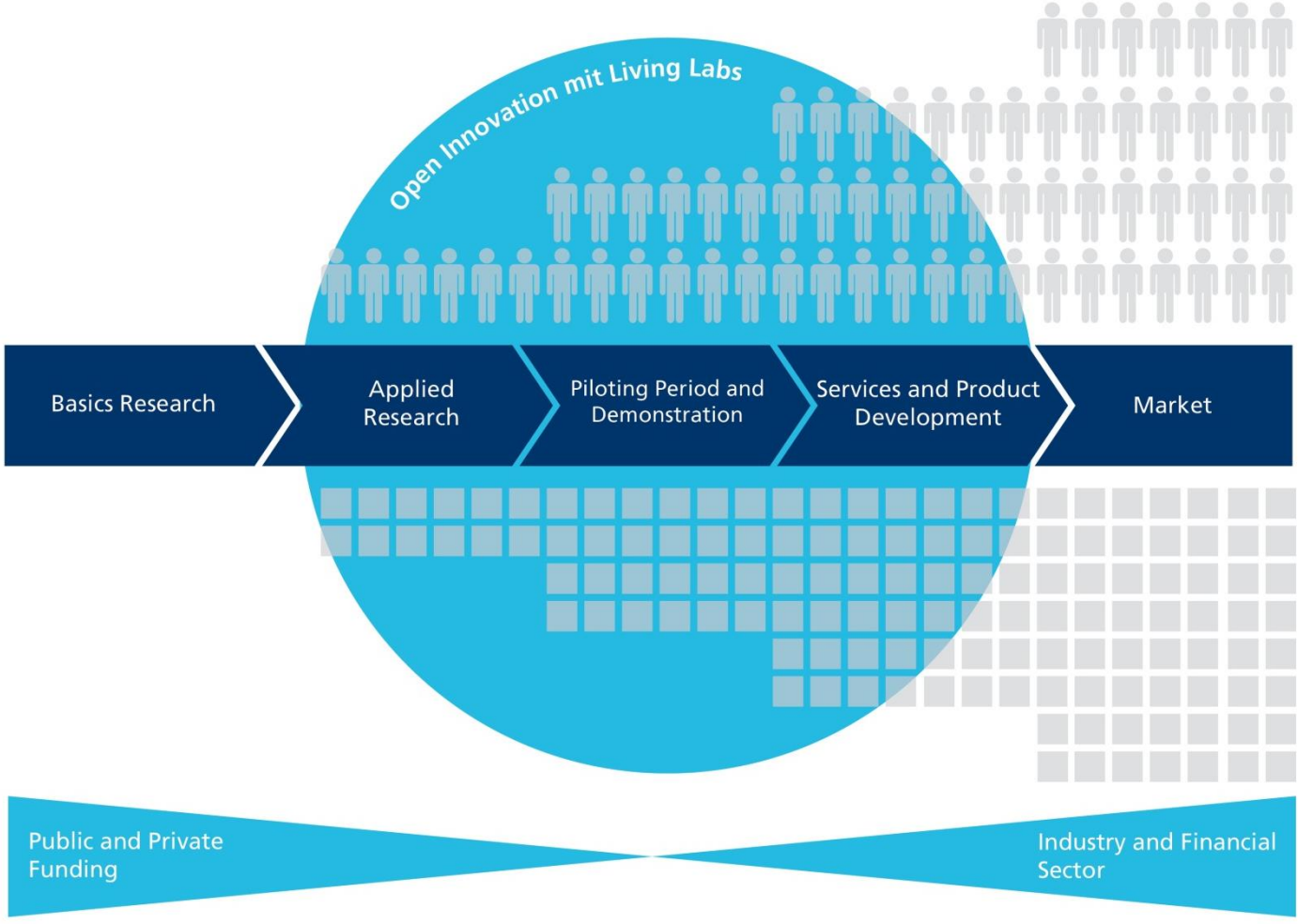
The inHaus-Goals
Successful innovations for rooms and buildings

- Still several good ideas for projects, system solutions or services are doomed to fail due to several aspects of the innovation process. Failure at the end of an innovation process manifests itself in form of a marketing flop and is costly.

- Reasons for failure are usually an excessive orientation towards technology, lack of integrating the end-user, dreading cooperating, an abundance of technical difficulties and risks as well as insufficient funding of the innovation process.

- Through application oriented Research-, Development- and Demonstration laboratories (**Living Labs**) and by intense cooperation with a performance –capable network of partners, the Fraunhofer-inHaus-Center offers a wide range of services and institutions to ensure a succsessful innovation process.

inHaus-method
Open Innovation in LivingLabs



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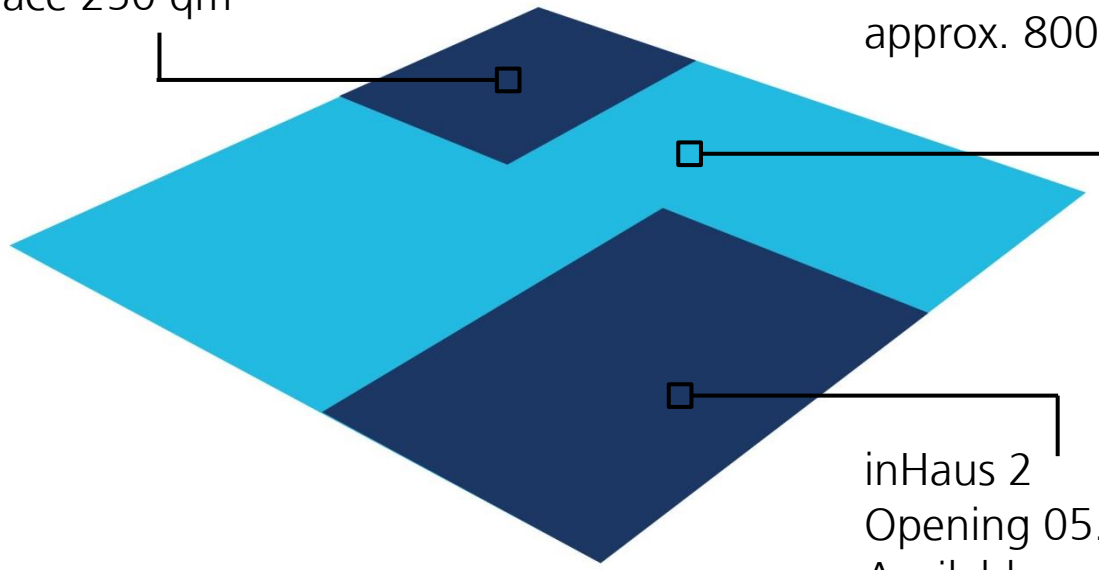
Business Units
Facts and figures

inHaus 1
Opening 03. April 2001
Available surface 250 qm

Terrain inHaus-Center
approx. 8000 qm



inHaus 2
Opening 05. Nov. 2008
Available surface 5.200 qm

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Business Units

- Living
- Building and Building Systems
- Energy Eficiency and Faciility Management
- Health and Care
- Hotel and Event
- Working
- Ressources

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Business Units
Organisation and Partners

- Involved Fraunhofer Institutes:
  IMS, ISST, UMSICHT

- Partner Network: over 120 business partners from different branches
- Research Network: Universities and external research institutes

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Business Unit
Living – Fraunhofer IMS

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Business Unit
Living – Fraunhofer IMS

- Integration of product components and energy-saving measures
- Assisted living systems that enable elderly people to live independently in their own home
- Smart Home-solutions

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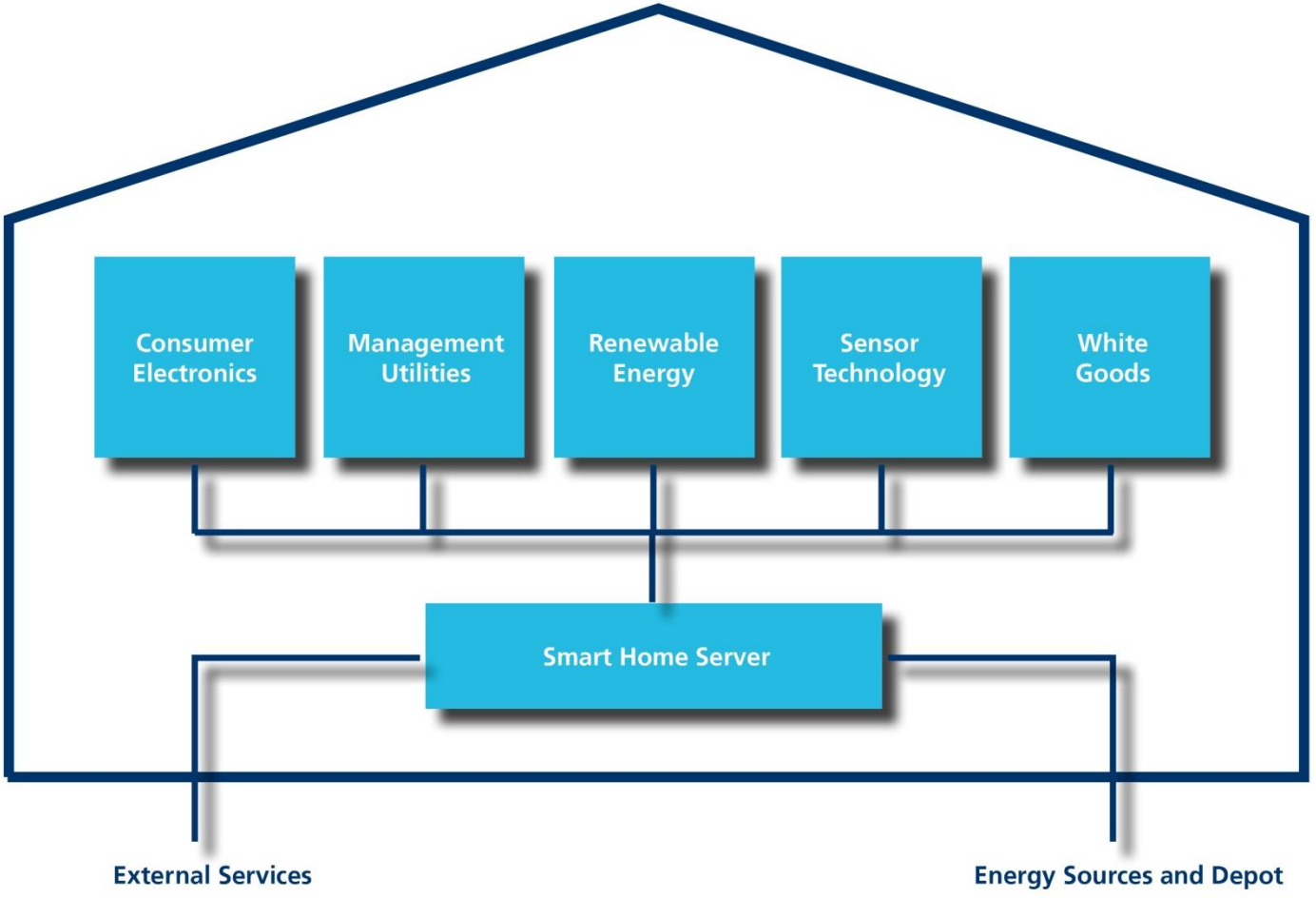
Business Unit
Living – Fraunhofer IMS (Living Lab inHaus 1)



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Business Unit
Building and Building Systems

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Business Unit
Building and Building Systems

- Enhancing the performance of rooms and buildings with new types of building systems
- Involving every employee working on a construction
- Overall system room and building
- Through their adaptive customizability in terms of utilization and the user, integrated system solutions make flexible floor plan management possible

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Business Unit
Energy- and Facility Technology

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Business Unit
Energy- and Facility Technology

- Technologies and systems that help to create a comfortable indoor enviroment and make it possible to operate a building in an energy-efficient way
- To improve the thermal, visual and acoustic comforts of indoor quality
- Overall aim: achieve energy effficiency, high-quality workplace, home enviroment, reduction of costs
- Recording and evaluating the relevant energy flows
- Continuous quality assurance

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Business Unit
Health and Care – Fraunhofer ISST

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Business Unit
Health and Care – Fraunhofer ISST

- Solutions for sustainable and innovative healthcare and social services
- Sustainable scenarios are pointed out with regards to all relevant participants and use cases forecast supply conditions of the future
- Combination of building automation, sensor technology, robotics, information and communication technology
- Hospital Engineering: consistent process management in the hospital

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Business Unit
Hotel and Event

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Business Unit
Hotel and Event

- Advancement of technical solutions, innovative concepts and products of hotel and events
- Evaluation of research approches and results
- Realistic enviroments for user testing of usabillity, acceptance and well-being
- Process analysis, optimization and logistics
- Hotel: Necessities of the guest, operability of technologies, well-being

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Business Unit
Working

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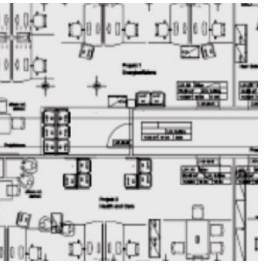
Business Unit
Working




- High-quality technological equipment and interconnection as well as room structures that enable user-defined utilization
- Optimization potential for the work infrastructure
- Employee and his necessities
- Office property, room solutions and intelligent infrastructure
- Strategic management in support of efficiency and effectivity
- Work-Life-Balance

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Business Unit
Ressources – Fraunhofer UMSICHT

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Business Unit
Ressources – Fraunhofer UMSICHT

- Research and Development of innovations, instruments and strategies
- As a cross sectional competence we optimize economic,ecological, technical and infrastructural criteria
- Life Cycle Assesment, Carbon-Footprints, sustainability management and strategies
- Interaction human-facility-enviroment
- Testing and optimizing energy-efficient and economic energy systems
- Integration of renewable energies into existing structures

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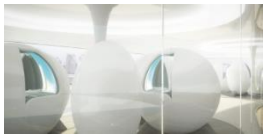
From material over components and systems to application solutions

Optimized functions and processes
(Room, Buildings, Applications)

Intelligent, integrated Room- and
Building Systems

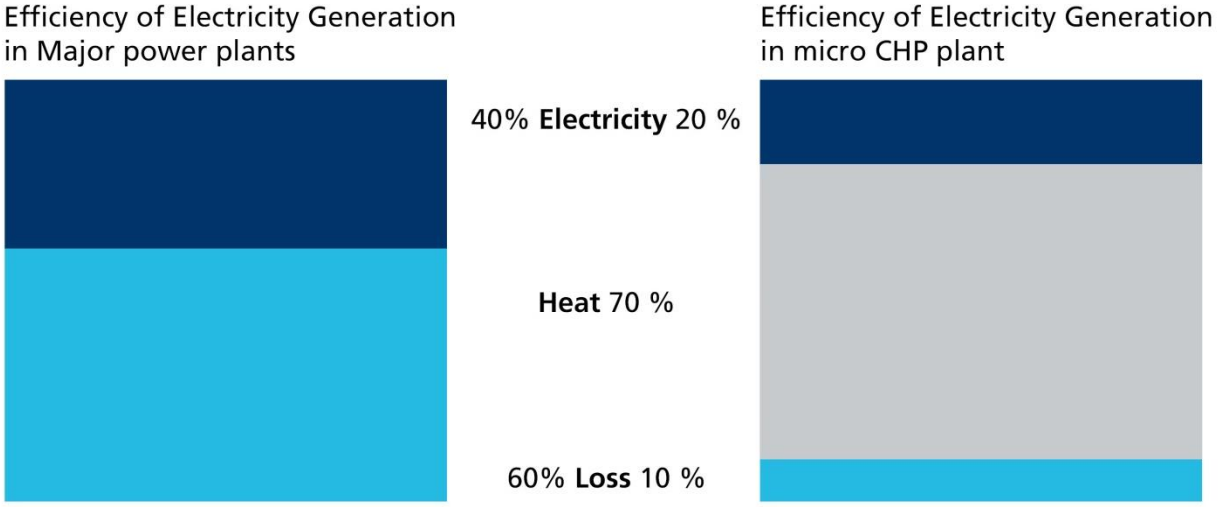
System-Integration procedures and technologies



Intelligent, integrated components with
System-ability (material, design, electronics)

inHaus-Testing facility
Decentralized power-heat coupling

- Micro block-typed thermal power station with gas engine,13 kW thermic, 4,7 kW electrical



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inHaus-Testing facility

Facility technology goes ITC – SmartMetering

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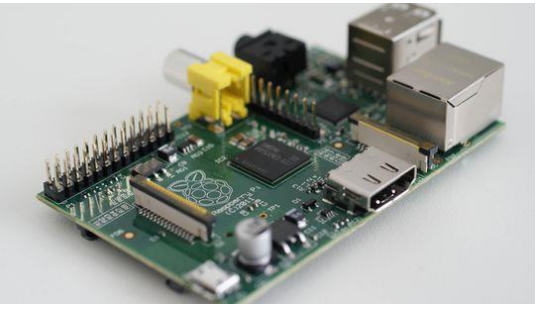
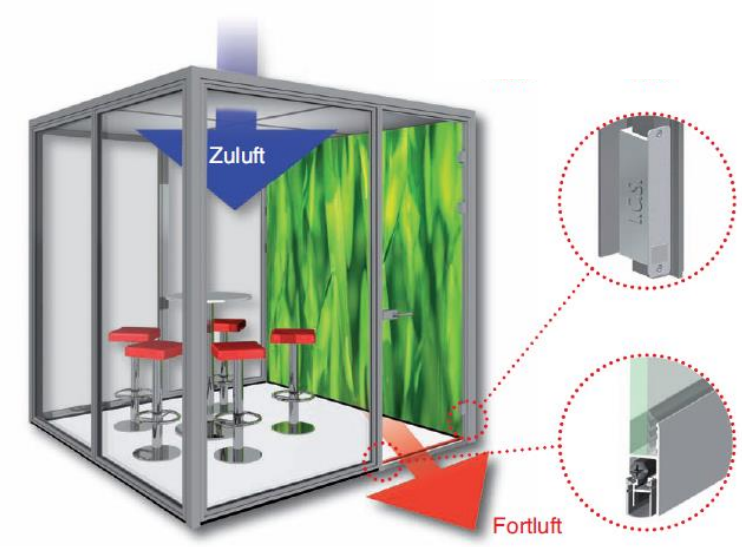
inHaus – Testing facility
Air quality – dependant regulation



- Electronically controlled, motorized door seals as active elements of ventilation and climate system for buildings
- Ambition: enhanced comfort and optimized energy efficiency in terms of facility air-conditioning



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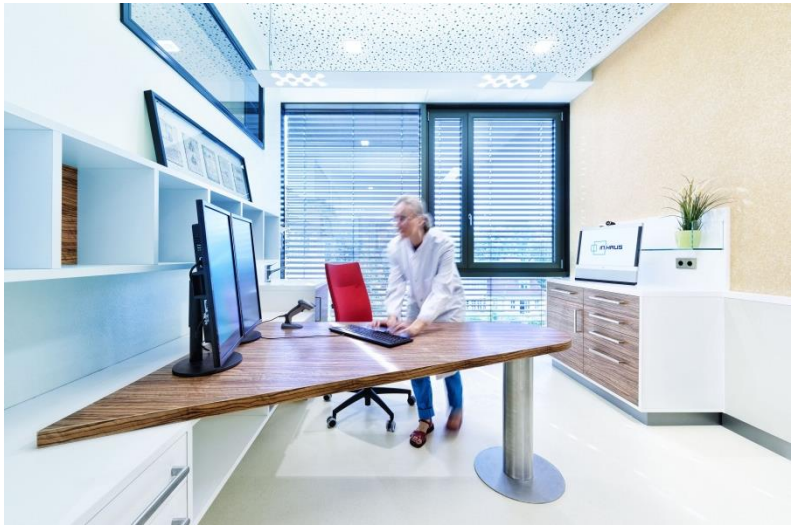
inHaus – Testing facility
Hospital Engineering



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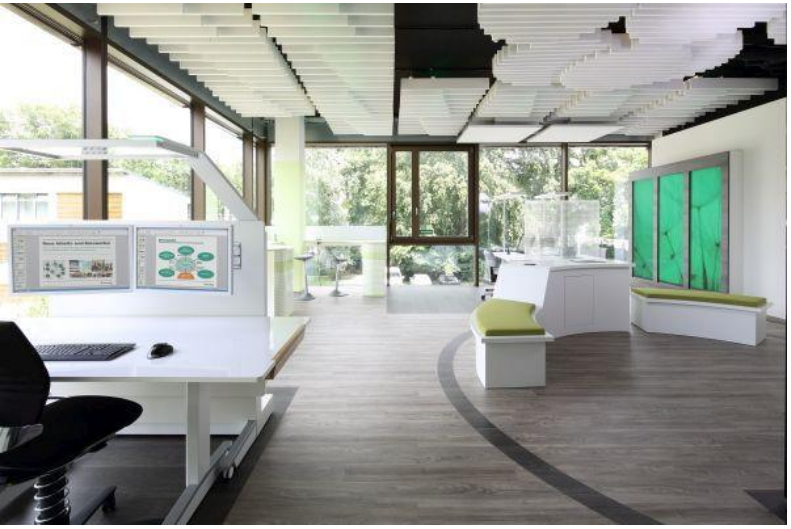
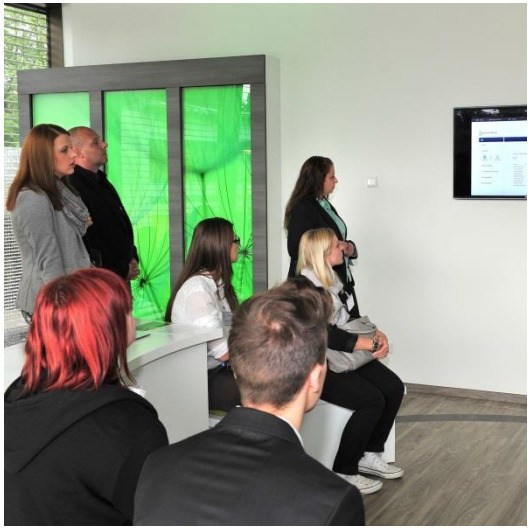
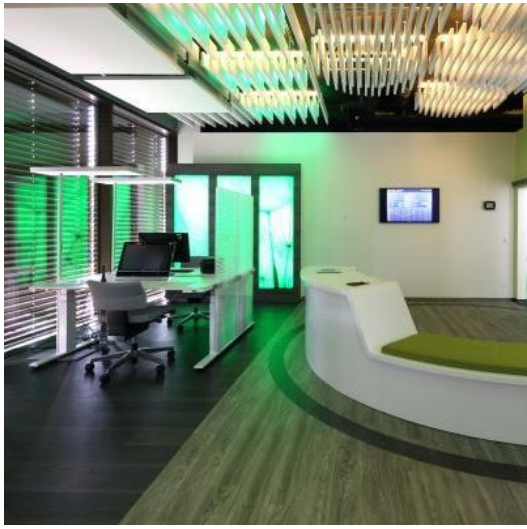
inHaus-Testing facility – New in 2014

inRaum – Assistive multifunctional office system (ATMO)







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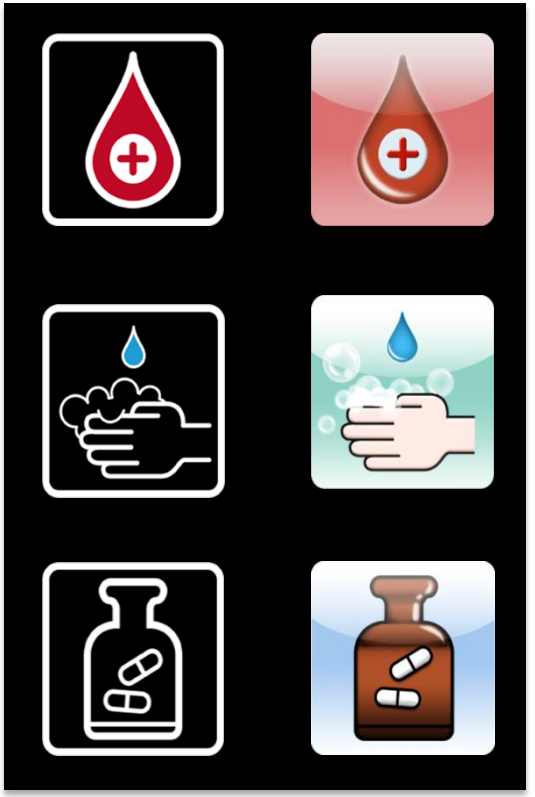
Fraunhofer-inHaus-Center – System development

inBath: Assisted room system for the care sector



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Fraunhofer-inHaus-Center – System development
Room automation with interconnected furniture systems

- Illuminated furniture : Attentiveness- control (medicine carbinet,wardrobe)
- „intelligent“cupboards and drawers: Visual and acoustic reminder, display of content,access control
- Furniture with tactile, interactive Feedback: vibrating handles, variable surfaces
- Furniture with motoric support: Compensation of motoric deficits (drawers open automatically when touched)
- Furniture with entertainment and information-function: Integrated displays

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Fraunhofer-inHaus-Center – Systemdevelopment

PCM-Cassette (thermal storage in glass facades)

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Fraunhofer-inHaus-Center – System Development

Heat-/ Cooling-/ Energy conserving systems

- Heat/ Cooling-/ storage frontage
- Intelligent Shadowing
- Geothermic plant
- Sorption cooling device
- BACnet- Building automation

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Transition of projects/ research into practise
Piloting innovative building systems

- Geothermy
- Thermal Activation
- Controlled Ventilation
- Functions for optimization of user-dependent energy consumption
- Longtime enery monitoring
- Client: BLB NRW
- Advisor FhG-Institute IMS

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„Together succsessful“

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