FRAUNHOFER-INHAUS-CENTER

Intelligent room and building systems
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 successful innovation process.

The inHaus-Goals
Successful innovations for rooms and buildings
inHaus-method
Open Innovation in LivingLabs
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
Business Units

- Living
- Building and Building Systems
- Energy Efficiency and Facility Management
- Health and Care
- Hotel and Event
- Working
- Resources
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
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
Business Unit
Living – Fraunhofer IMS (Living Lab inHaus 1)
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
Business Unit
Energy- and Facility Technology
Business Unit
Energy- and Facility Technology

- Technologies and systems that help to create a comfortable indoor environment 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 efficiency, high-quality workplace, home environment, reduction of costs
- Recording and evaluating the relevant energy flows
- Continuous quality assurance
Business Unit
Health and Care – Fraunhofer ISST
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
Business Unit Hotel and Event

- Advancement of technical solutions, innovative concepts and products of hotel and events
- Evaluation of research approaches and results
- Realistic environments for user testing of usability, acceptance and well-being
- Process analysis, optimization and logistics
- Hotel: Necessities of the guest, operability of technologies, well-being
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
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 Assessment, Carbon-Footprints, sustainability management and strategies
- Interaction human-facility-environment
- Testing and optimizing energy-efficient and economic energy systems
- Integration of renewable energies into existing structures
From material over components and systems to application solutions

<table>
<thead>
<tr>
<th>Optimized functions and processes (Room, Buildings, Applications)</th>
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<tr>
<td>Intelligent, integrated Room- and Building Systems</td>
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<td>System-Integration procedures and technologies</td>
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<td>Intelligent, integrated components with System-ability (material, design, electronics)</td>
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inHaus-Testing facility
Decentralized power-heat coupling

- Micro block-typed thermal power station with gas engine, 13 kW thermic, 4.7 kW electrical
inHaus-Testing facility
Facility technology goes ITC – SmartMetering
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
inHaus – Testing facility
Hospital Engineering
inHaus-Testing facility – New in 2014
inRaum – Assistive multifunctional office system (ATMO)
Fraunhofer-inHaus-Center – System development inBath: Assisted room system for the care sector
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
Fraunhofer-inHaus-Center – Systemdevelopment
PCM-Cassette (thermal storage in glass facades)
Heat/ Cooling-/ Energy conserving systems

- Heat/ Cooling-/ storage frontage
- Intelligent Shadowing
- Geothermic plant
- Sorption cooling device
- BACnet- Building automation
Transition of projects/research into practise
Piloting innovative building systems

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