

SmarterCities, Berlin 23/24 June 2009

## **iRegion Karlsruhe – the road to Smarter Infrastructures**

**Dr. Carsten Holtmann  
FZI Forschungszentrum  
Informatik, Research Center for  
Information Technology  
Karlsruhe, Germany**

# Karlsruhe: Among the solution architects for SmarterCities

9.000 scientists and  
30.000 IT-specialists

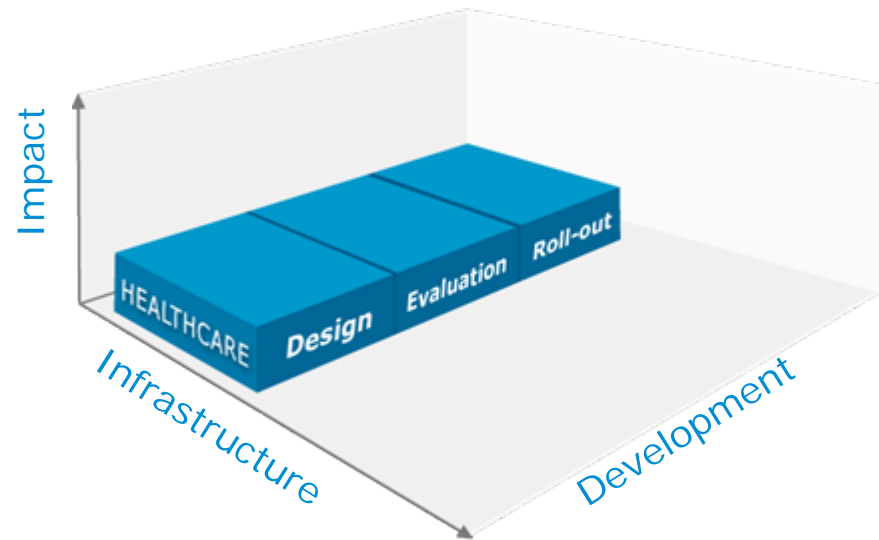
One of the top European ICT clusters  
ready to solve problems by  
**adding smartness to the  
infrastructures**



## Agenda

Smart Healthcare  
solution with regional scope

... and the more general  
iRegion vision for a  
SmarterPlanet



## Background

### Stroke

- 20% of the patients die within 3 month, 29% within 12
- main reason for lifelong disablement
- in Germany 3.4 million cases and
- direct treatment costs of 108,6 billion EURO until 2025

### Time is brain: 3 hours time to start lysis therapy

### Lysis is best therapy option, *but ...*

- only 3% of stroke patients get it today, ca. 20% possible
- a main reason: infrastructure deficits

#### Stroke Rescue Chain



stroke

lysis therapy



## Augment infrastructure by a Digital Awareness Layer



- handheld computer with an electronic checklist (DSS)
- 'informed' treatment & transport decisions
- while transport, data send to next hospital (Stroke Unit)
  - pre-admission of the patient
  - physicians pre-informed with detailed information
  - hospital infrastructure (e.g. CT) booked and prepared



**Information Integration:** Technology and organizational changes

Stroke Rescue Chain



# Stroke Angel: Saving lives and costs by smarter care for stroke patients

## Augment infrastructure by a Digital Awareness Layer

- case data automatically collected
  - data stored in a database and analyzed in detail to
    - get general insights
  - provide individual feedback to paramedics, nurses, physicians, also management
- Transparency and scientific insights

**Feedback Services: Learning & Motivation**

**Information Integration:** Technology and organizational changes

Stroke Rescue Chain



## Regional study (2006 – 2008)

- Clinical process time reduced by 50% down to 20 min (door2CT)
- Lysis rate doubled from 6 to 11%
- Number of patients treated at one hospital tripled from 300 to 900 p.a.

**Information Integration:** Technology and organizational changes

Stroke Rescue Chain



## Regional study (2006 – 2008)

- Clinical process time reduced by 50%
- Lysis rate doubled from 6 to 11%
- Number of patients treated in one hospital more than tripled from 250 to 900 p.a.

## Work in Progress

- Aggregated level: impact analysis w.r.t. area, type of event, ...
- Individual level:
  - success and failures = process improvements
  - quality of work & patient recovery = personal learning & motivation

**Feedback Services: Learning & Motivation**

**Information Integration: Technology and organizational changes**

**Stroke Rescue Chain**



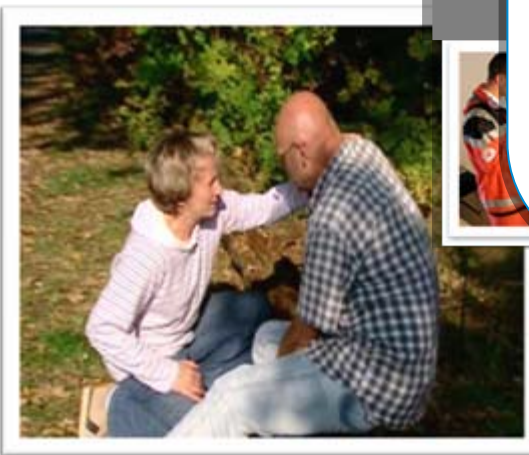
## Regional study (2006 – 2008)

- Clinical process time reduced by 50%
- Lysis rate doubled from 6 to 11%
- Number of patients treated in one hospital more than tripled from 300 to 900 p.a.

## Work in Progress

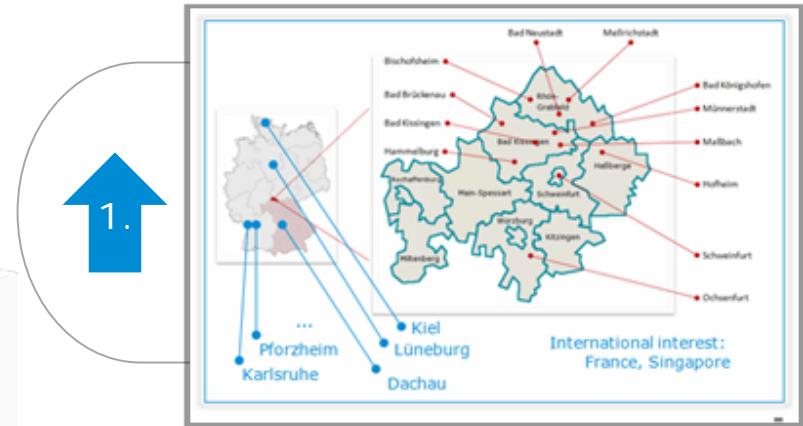
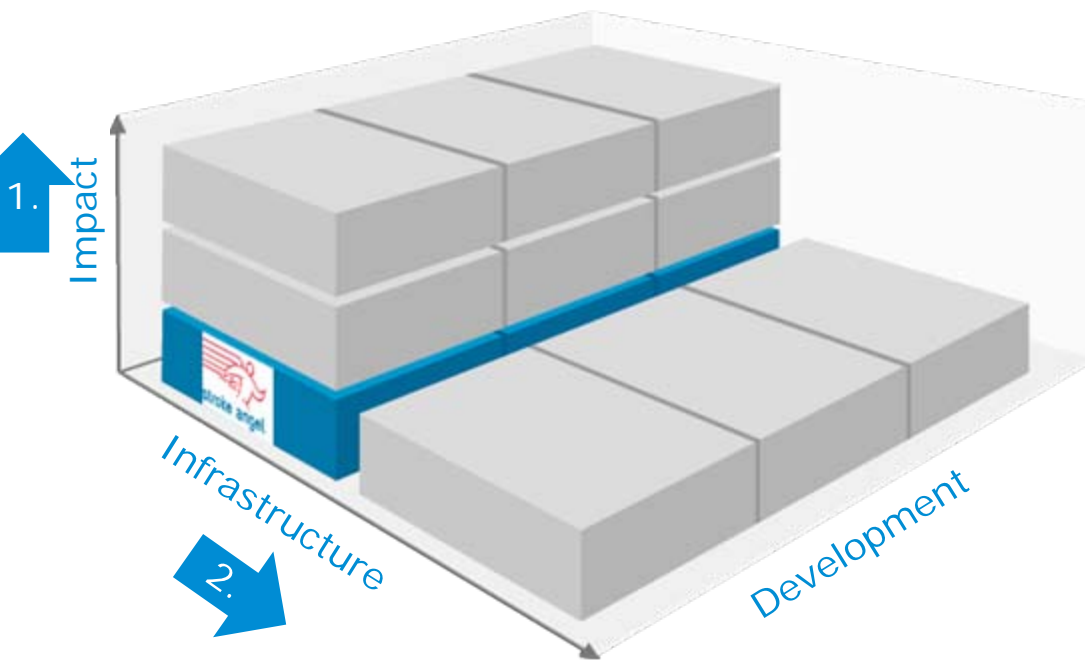
- Aggregated level: impact analysis w.r.t. area, type of event, ...
- Individual level:

• Improving patient recovery  
• Improving patient learning & motivation



# Stroke Angel: Pilot for something much bigger?

## How will we proceed?



## Traditional remedies to urban, regional, national & global infrastructure bottlenecks

- extensive approach: more streets
- intensive approach: more lanes/ uniform speed
- regulative approach: city toll

### Smart approach:

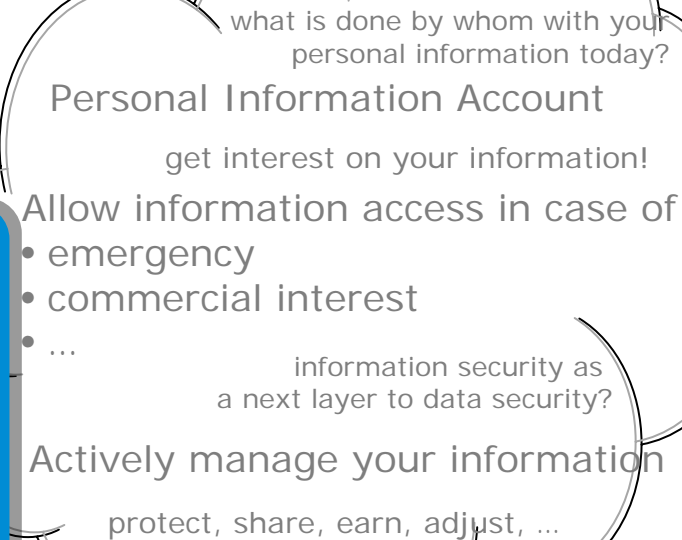
Know much more about *each* individual and use the knowledge to the benefit of *all*

**People are already Smart! People know.**

We need a new interpretation of data security

**Protect individual information to share it**  
(not: protect information to hide it)

- opportunity for active individual info management
- opportunity for highly individualized services
- basis for collective intelligence solutions



what is done by whom with your personal information today?

Personal Information Account

get interest on your information!

Allow information access in case of

- emergency
- commercial interest
- ...

information security as a next layer to data security?

Actively manage your information

protect, share, earn, adjust, ...

***Some food for thought for your travel:***

*"If you could easily and securely manage and share the information ... where you travel, why you travel, when you want to do what (e.g. meet whom), how well could individual service provision to you & infrastructure management be?!"*

„Protect individual information to share it“  
... soon a reality in Karlsruhe as a regional testbed.



**Dr. Carsten Holtmann**

Division Manager FZI  
Forschungszentrum Informatik  
Haid-und-Neu-Str. 10-14  
D-76131 Karlsruhe  
<http://www.fzi.de>  
[holtmann@fzi.de](mailto:holtmann@fzi.de)



**Hagen Buchwald**

President Cyberforum, Karlsruhe



**Prof. Dr. Dr. h.c. Peter Lockemann**

Director FZI



**Prof. Dr. Gerhard Satzger**

Director Karlsruhe Service  
Research Institute, University Karlsruhe

Want to know more? Just talk to us. We are glad to answer your questions.

**SmarterCities**  
Berlin

**Smarter**  
**Healthcare**

