



HealthService24 Continuous Mobile Services for Healthcare

eTEN-C517352



PROJECT PRESENTATION



Project Facts and Figures



Our vision, goals & time plan

Vision of HealthService24



HealthService24 aims at launching **innovative, integrated mobile healthcare services**, supporting patient and health professional **mobility**, as well as enhancing quality-of-care whilst decreasing health expenditures



Goals of HealthService24

- **Offer a viable mobile healthcare service** permitting health professionals to remotely assess, diagnose and treat patients whilst the patients are free to continue with daily life activities and stay fully mobile
- **Test the feasibility of the deployment** of the existing prototype on the European market via pilot runs (prototype is based on the solution that was developed in the MobiHealth project, IST-2001-36006)
- **Demonstrate and validate** the precise conditions to be fulfilled for subsequent commercial deployment
- **Make the service applicable** to many areas, ranging from patient management to sports, with post hospitalisation, public healthcare and home care

The project shall result in obtaining a fully marketable solution

HealthService24 – Project Consortium



University of Twente
The Netherlands



University of Cyprus



Medisch Spectrum ▲ Twente

HealthService24 – eTEN-517352



HS24 project duration:	February 2005 – September 2006
Project type:	Market validation, eTEN
Project objectives:	Validation of existing prototype Acceptance by hospital staff and patients Integration into existing systems & processes Health economics potential
Focus of the pilots:	COPD patients (Hospital Clínic, Barcelona) Cardiac Patients (LITO Polyclinic, Cyprus) High risk pregnancies (MST, Enschede)
Total project costs:	2.24 mil € (EC contribution: 1.2 mil €)
More info:	www.healthservice24.com



The HealthService24 Mobile Monitoring System



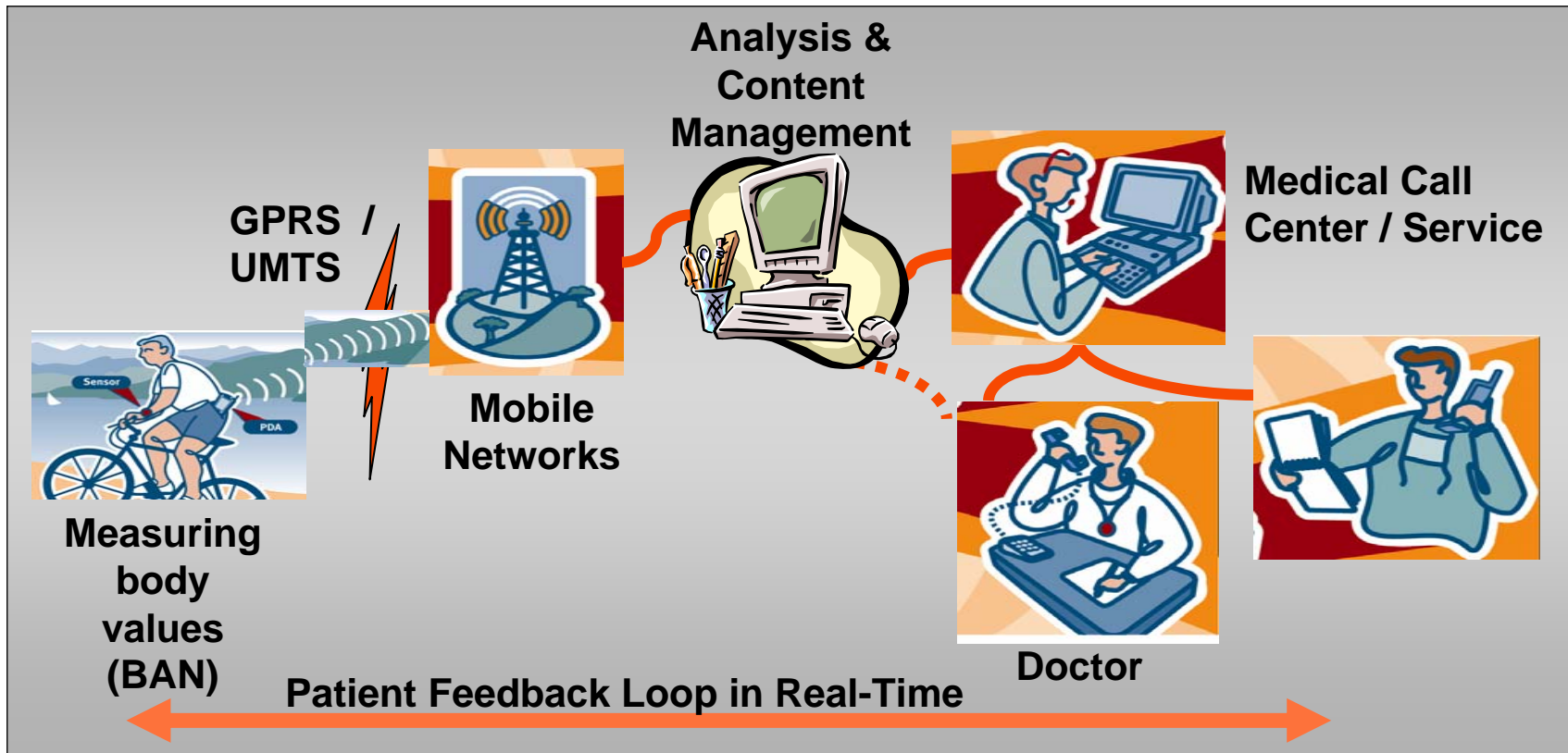
The technology behind

HS24 – Functional System Description

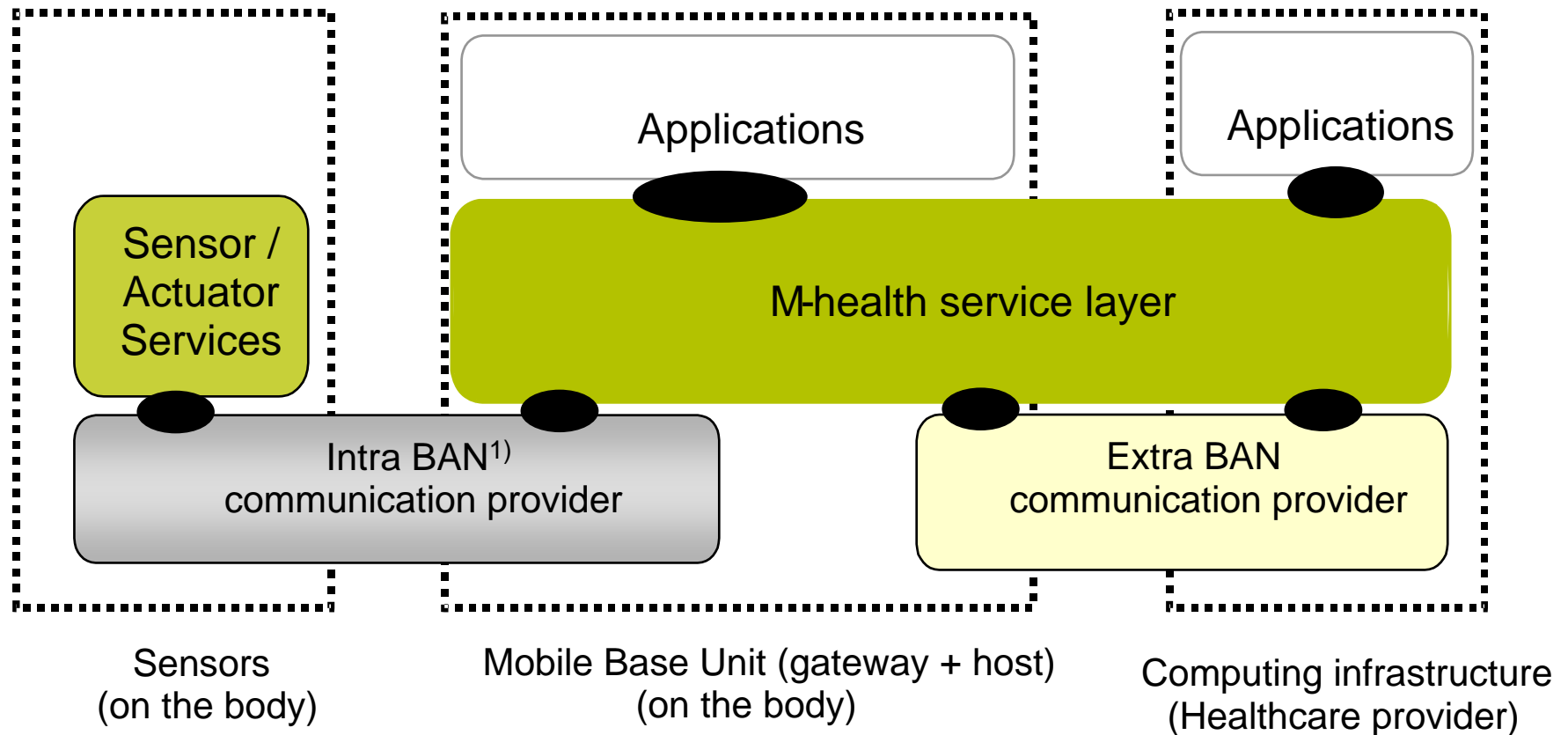


- A user is equipped with **sensors** interconnected under a Body Area Network (**BAN**) managed by a **PDA** or a **mobile telephone**
- The collected data is constantly and wirelessly transmitted via **UMTS** or **GPRS** to a medical service centre or directly to medical professionals
- Included content management functionality allows for immediate analysis of individual body data and **personalized patient feed-back** in real-time (e.g. alarms or reminders)
- Healthcare professionals can remotely assess, diagnose and treat patients whilst the patients stay mobile. In case of rapidly deteriorating medical conditions, the data centre can also send an **SMS**-alarm or provide the patient with a first level medical support

A mobile communication platform for healthcare



Overall system architecture

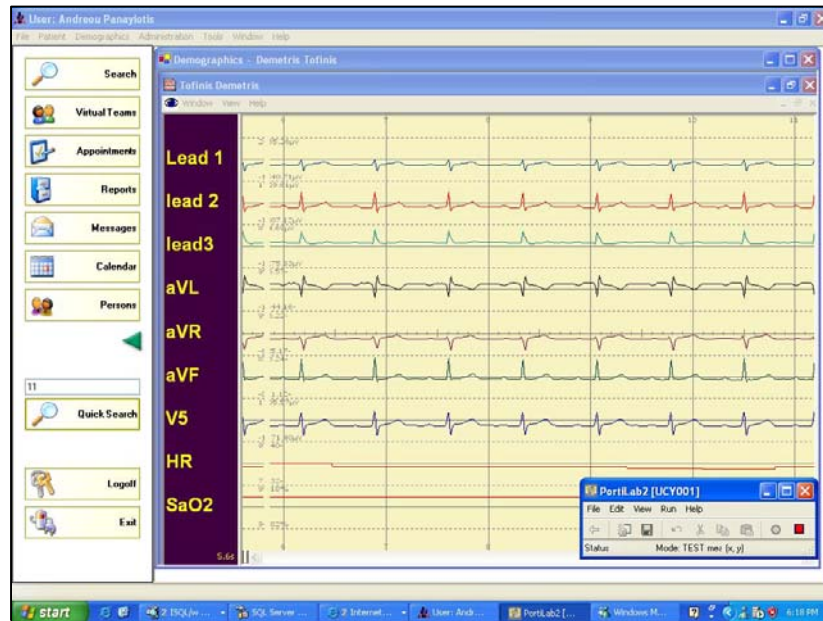


1) BAN=Body Area Network

The HealthService24 end-user device



Patient Management System Integration



- Software for patient management, including
 - Patient demographics
 - Past history (including previous hospital admissions)
- Selected episodes (e.g. previous ECGs and other tests)
 - Medication
 - Alerts
 - Statistics, audits, management reports

The HS24 BAN system was successfully integrated into DITIS – the Patient Management System used at one of the trial sites to further enhance efficiency.



Vital signs HS24 2.0.1R

The following vital signs can be measured with the HS24 2.0 system

- ECG (4 channels, 24bits)
- EMG (4 channels, 24bits)
- Plethysmogram (wave form, 8bits)
- SpO2 (0-100%)
- Pulserate (0-255)
- Respiration (wave form, 24bits)
- Skin temperature (25-40C)
- Activity - step-counter (optional)

Note: TMSi Mobi4/5 up to 256Hz sample freq. over GPRS (Vodafone NL)



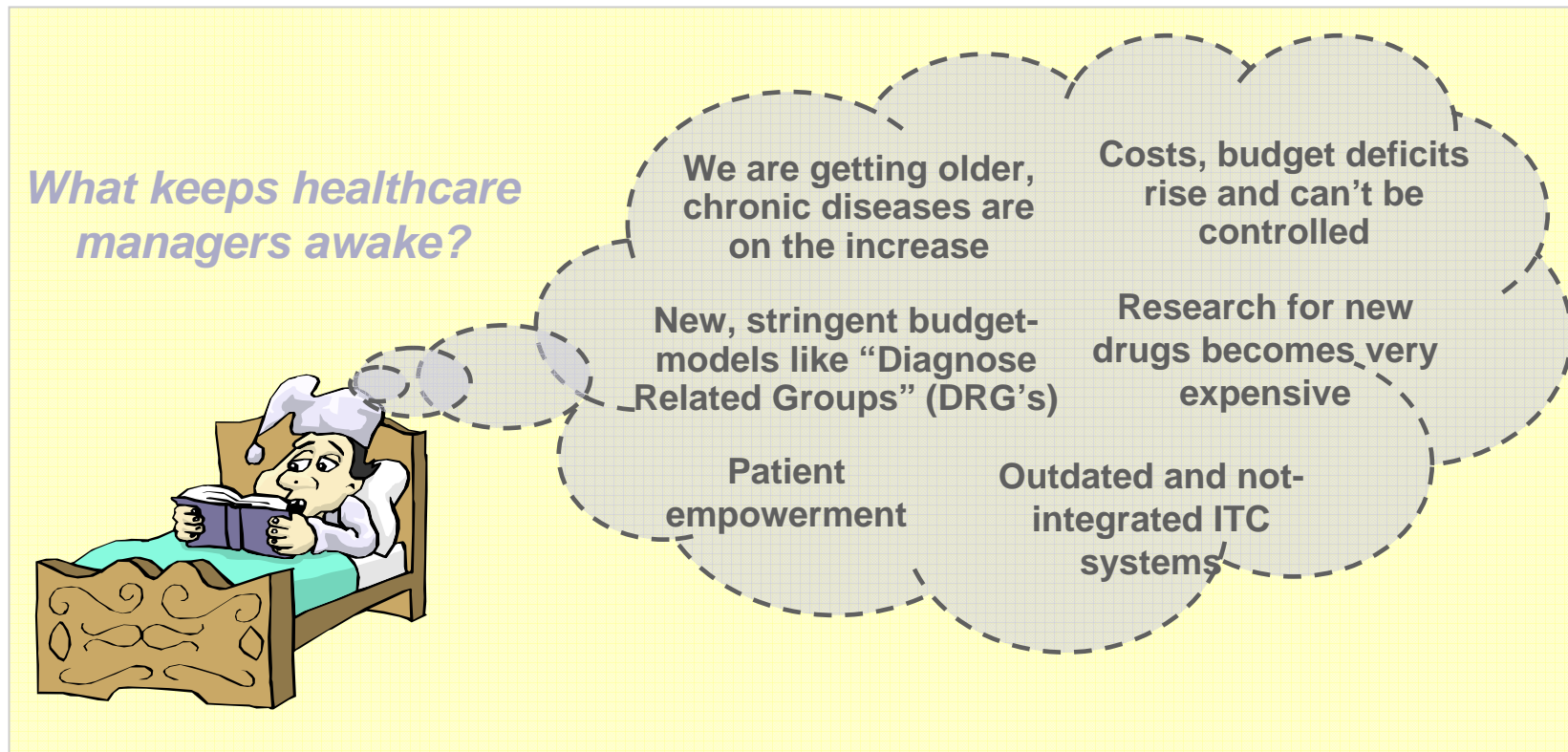
Market Considerations



Show me the money!



Current challenges in the healthcare



m-health services are suitable to contribute to solving the challenges of the healthcare sector



The future of m-health

Different resources come up with different market figures and prognosis due to different definition of mobile healthcare ...

Although numbers are dynamic, a clear trend is registered:

- ⇒ Personal healthcare, prevention, fitness and wellness is one of the most dynamically expanding markets concerning consumption of media and information systems – including mobile solutions ¹⁾
- ⇒ Mobile Healthcare will be one of the most rapidly growing segments in the area of mobile enterprise solutions ²⁾

1) Durlacher

2) Gartner Group



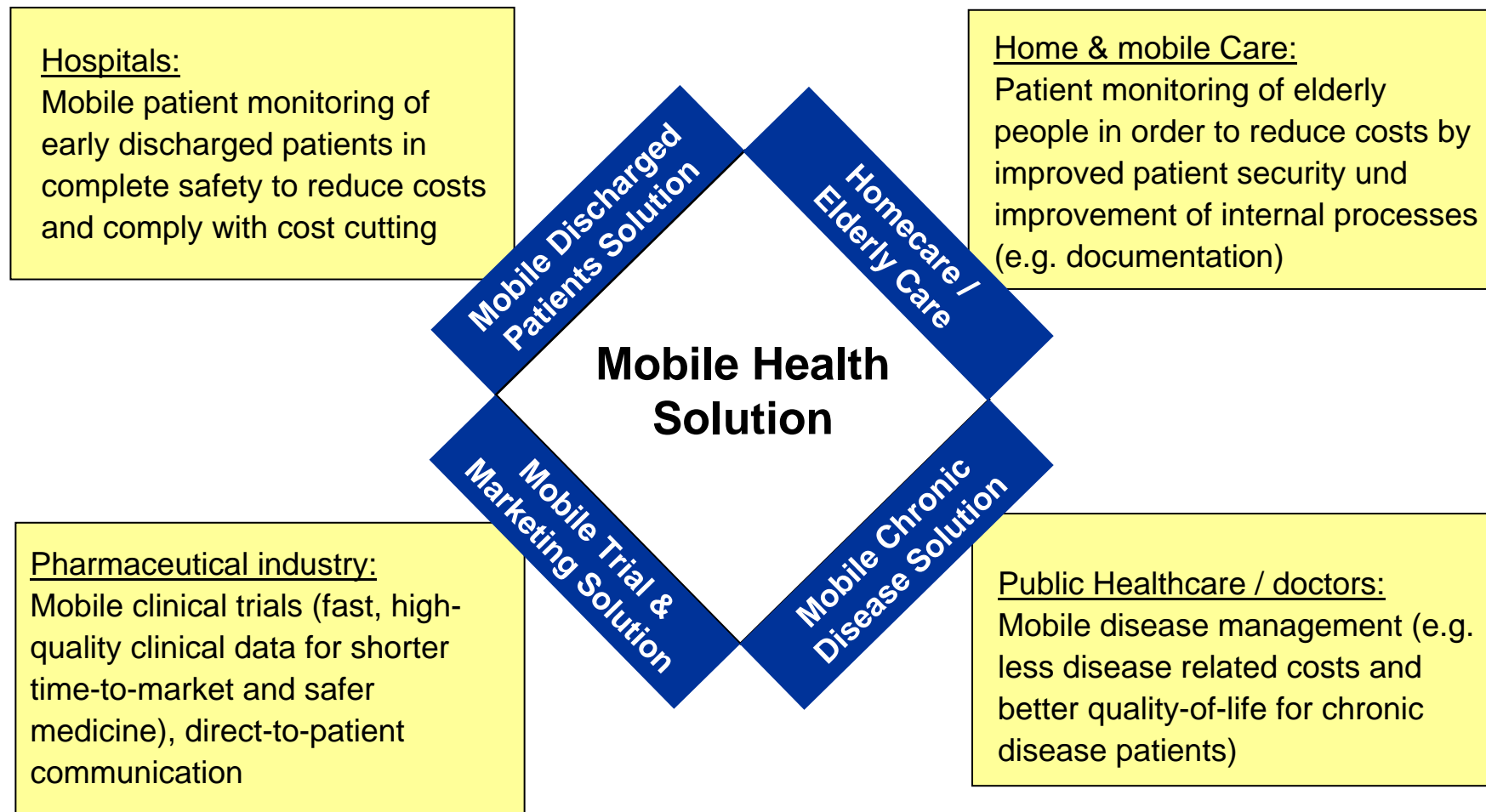
m-health market projections

Forecast for total e- and m-health market potentials in EU countries –
exemplified calculation for the German market

- **Health industry 2010:** **271 Billion Euros (figure for Germany)**
- **eHealth industry 2010:** **5 % of health budgets will be invested in eHealth systems and services:**
for Germany: 13.55 Billion Euros
- **mHealth industry share:** **10-15% of eHealth budgets**
for Germany: 1.356 - 2.03 Billion Euros

Source: European Union

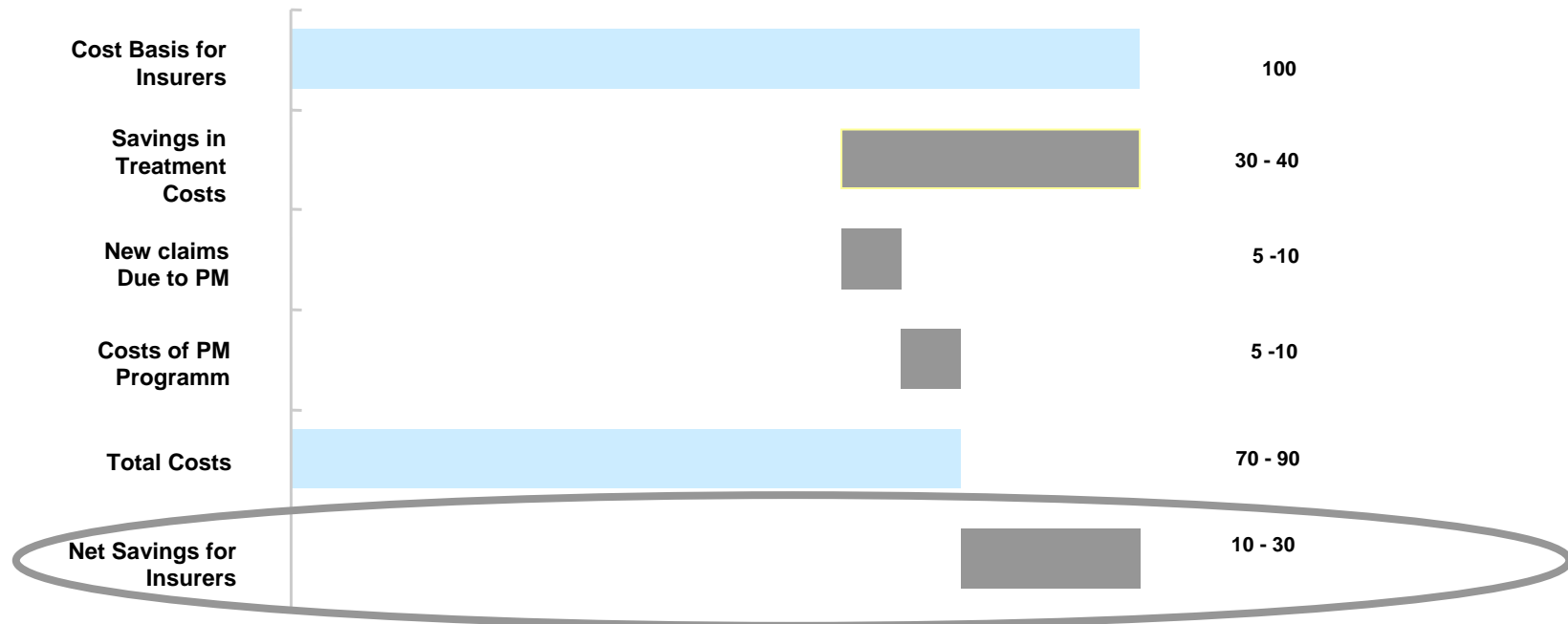
Target groups and value proposition



Savings through disease management - Asthma (I)



The Asthma case: potential yearly net savings/patient in Germany amount to €600 - €1800 (10-30%)



Source: McKinsey

Savings through disease management

Asthma (II)

The Asthma case: potential yearly net savings of €24-72 mil for the German healthcare system (based on 1% acceptance)

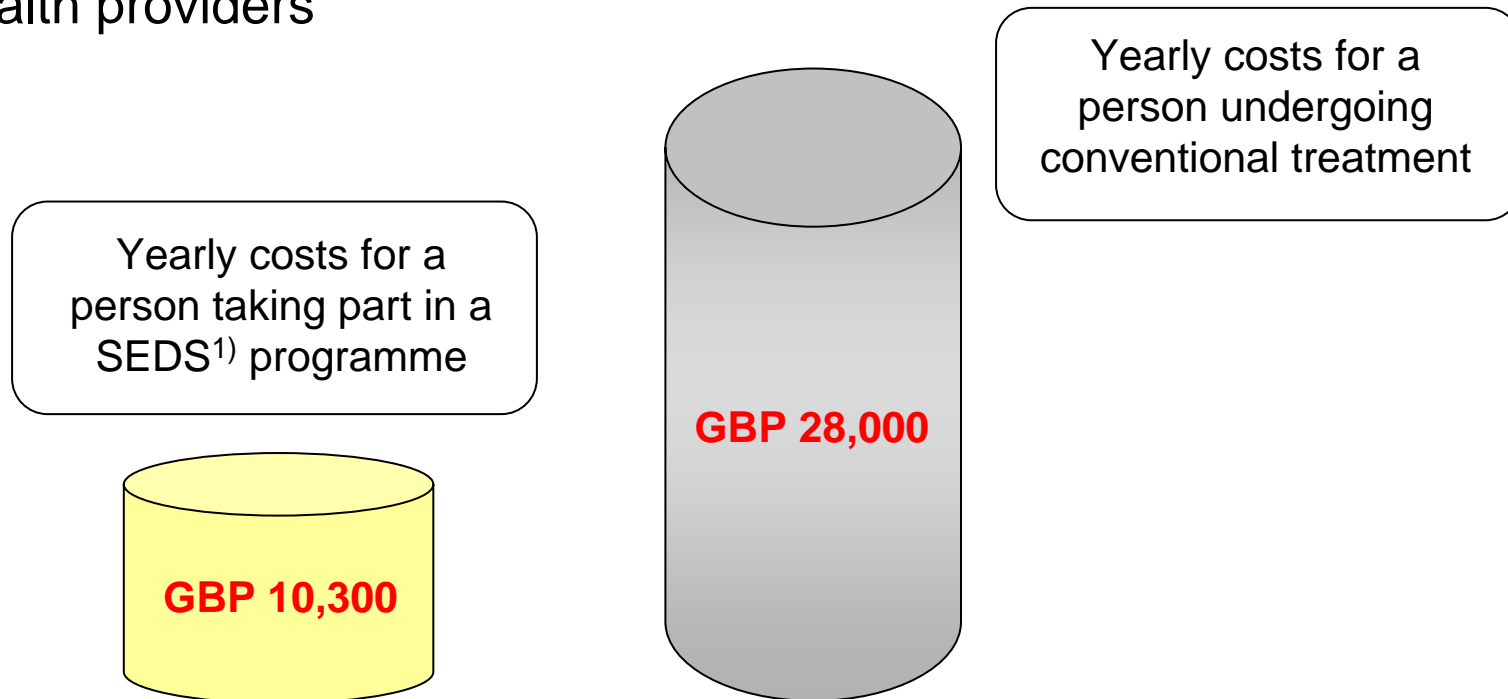
Disease	Prevalence	Potential users	Acceptance*
Diabetes	5.000.000	500.000	50.000
Stroke	1.500.000	450.000	15.000
→ Asthma	4.000.000	120.000	40.000
Hypertension	17.600.000	528.000	176.000
CAD	1.500.000	45.000	15.000
Total potential users		888.000	296.000

Potential savings:
€24 – 72 mil

* Estimated acceptance rates for mobile patient management programs

Example: cost savings in public health through patient management (UK)

Mobile patient management can yield significant cost savings for health providers



Source: Wireless Healthcare 2004

1) SEDS – Supervised Exercise, Diet and Stress management programme

Example: cost savings in public health through early hospital discharge (UK)

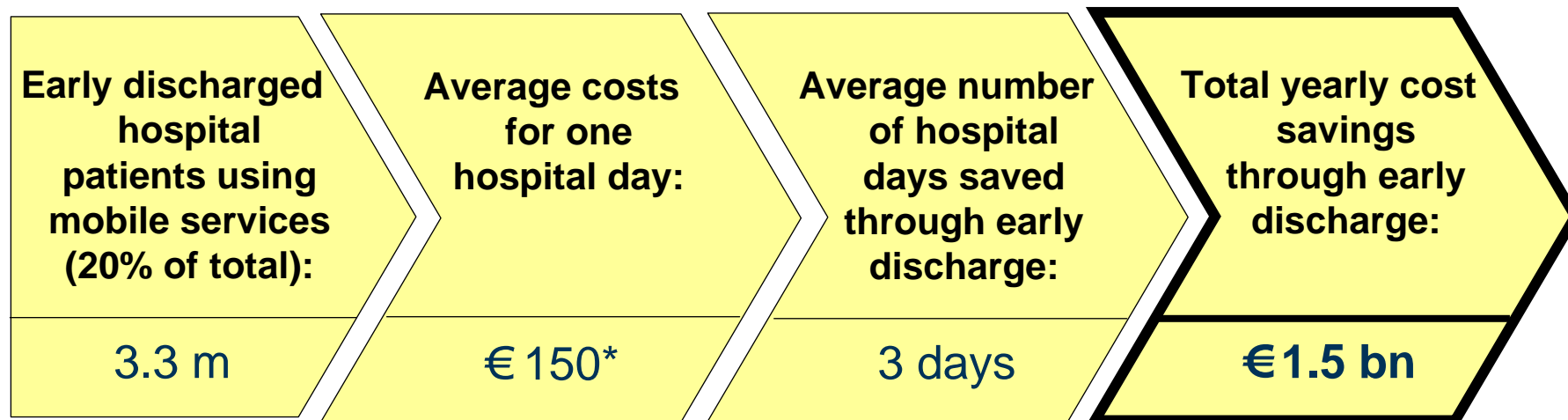
Discharging patients earlier from hospitals to their homes can result in savings of 85% in weekly care costs



Source: Wireless Healthcare 2004

Mobile applications help hospitals to lower care costs

Hospitals in Germany can save up to €1.5 bn per year through early discharge of patients made possible by mobile monitoring services

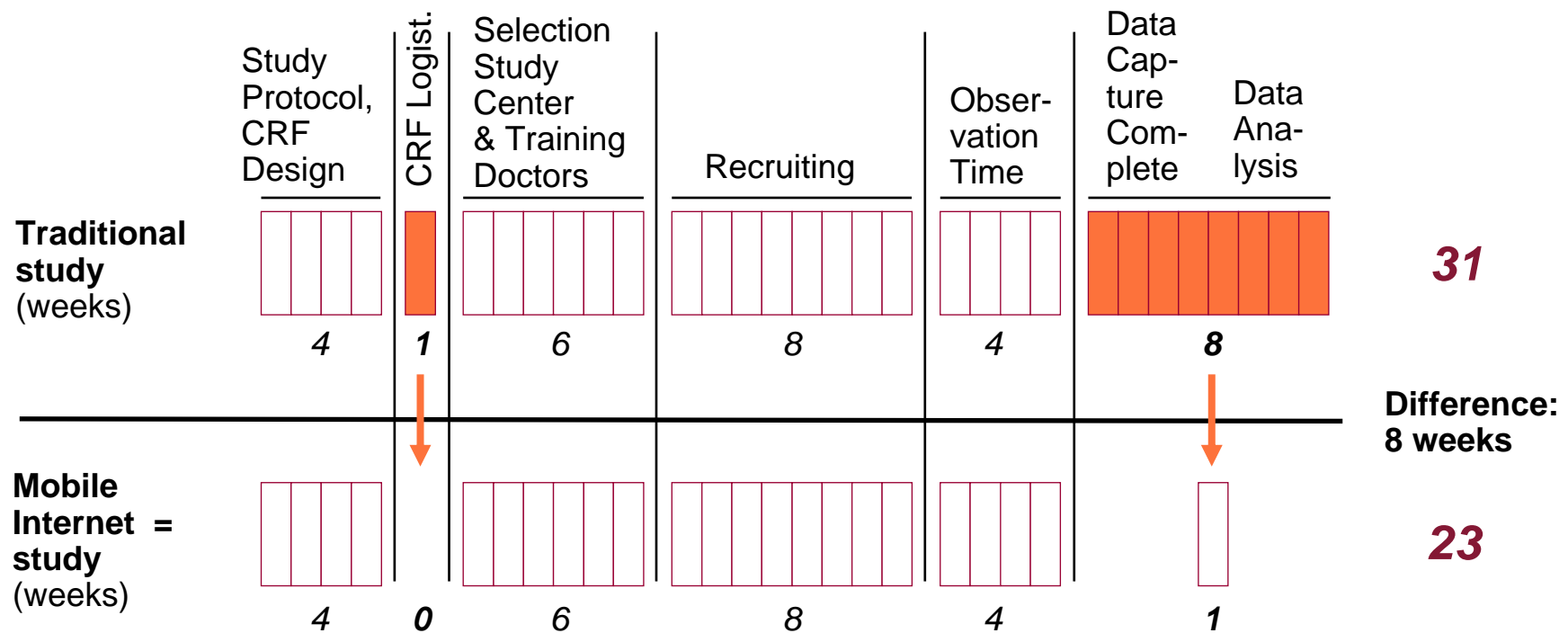


* Excl. administrative costs that are also applicable if using a mobile monitoring system

Source: GesundheitScout 24 GmbH
Bayerisches Rotes Kreuz

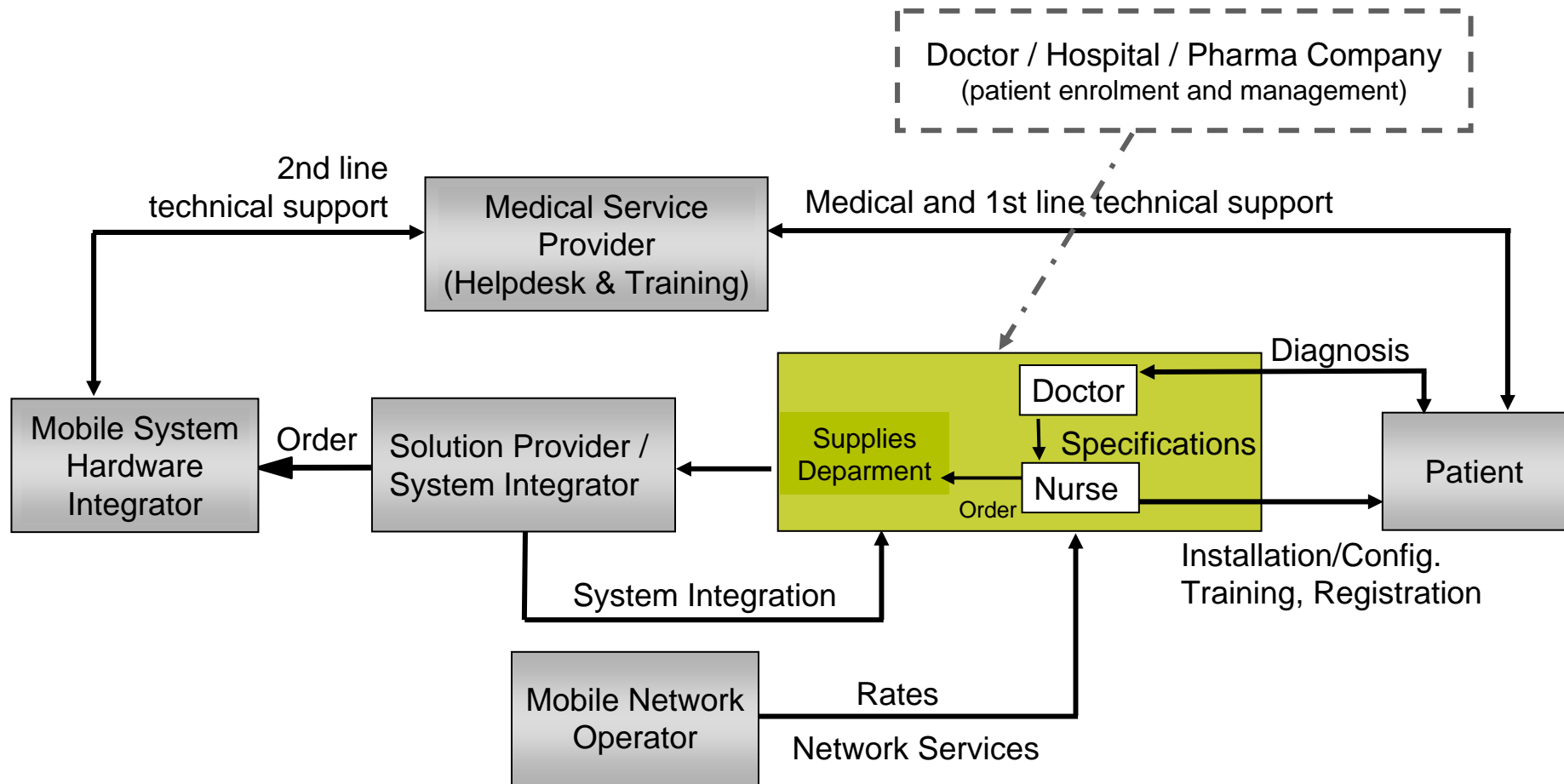
Benefits for pharma companies: shortening of clinical trial time

The pharma industry loses on average \$ 1 mil for each day a new pharmaceutical product is not yet on the market



Source: BMZ (CRO), Munich

Model for a service and supply chain



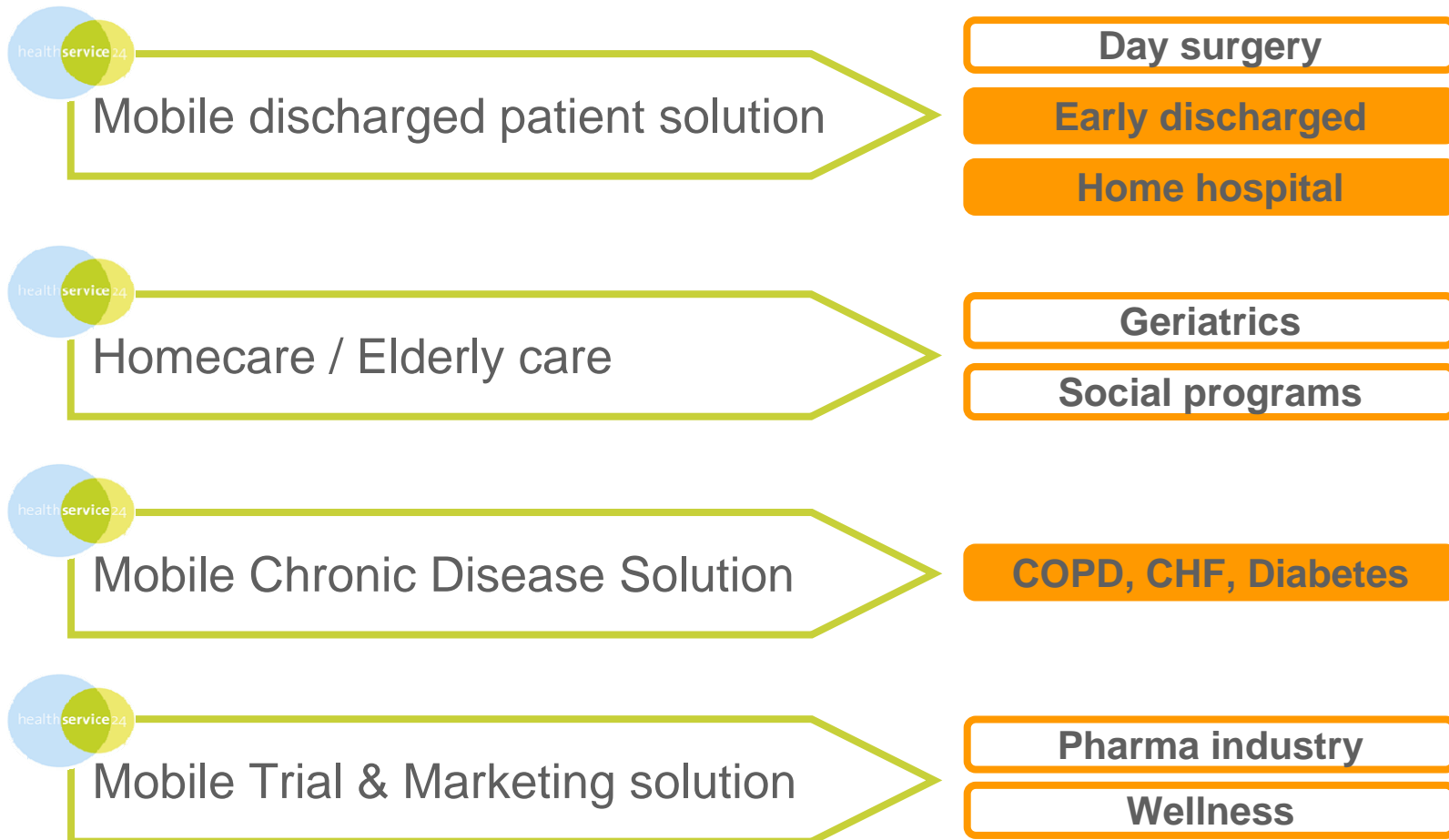


The HealthService24 Validation pilots



What we did & results

HS24 target groups



HS24 validation pilots



- Follow-up / prevention program in frail chronic patients (cardio-respiratory diseases)
- HS24 supports professional mobility (+ Patient self-monitoring)
25 patients were trialed



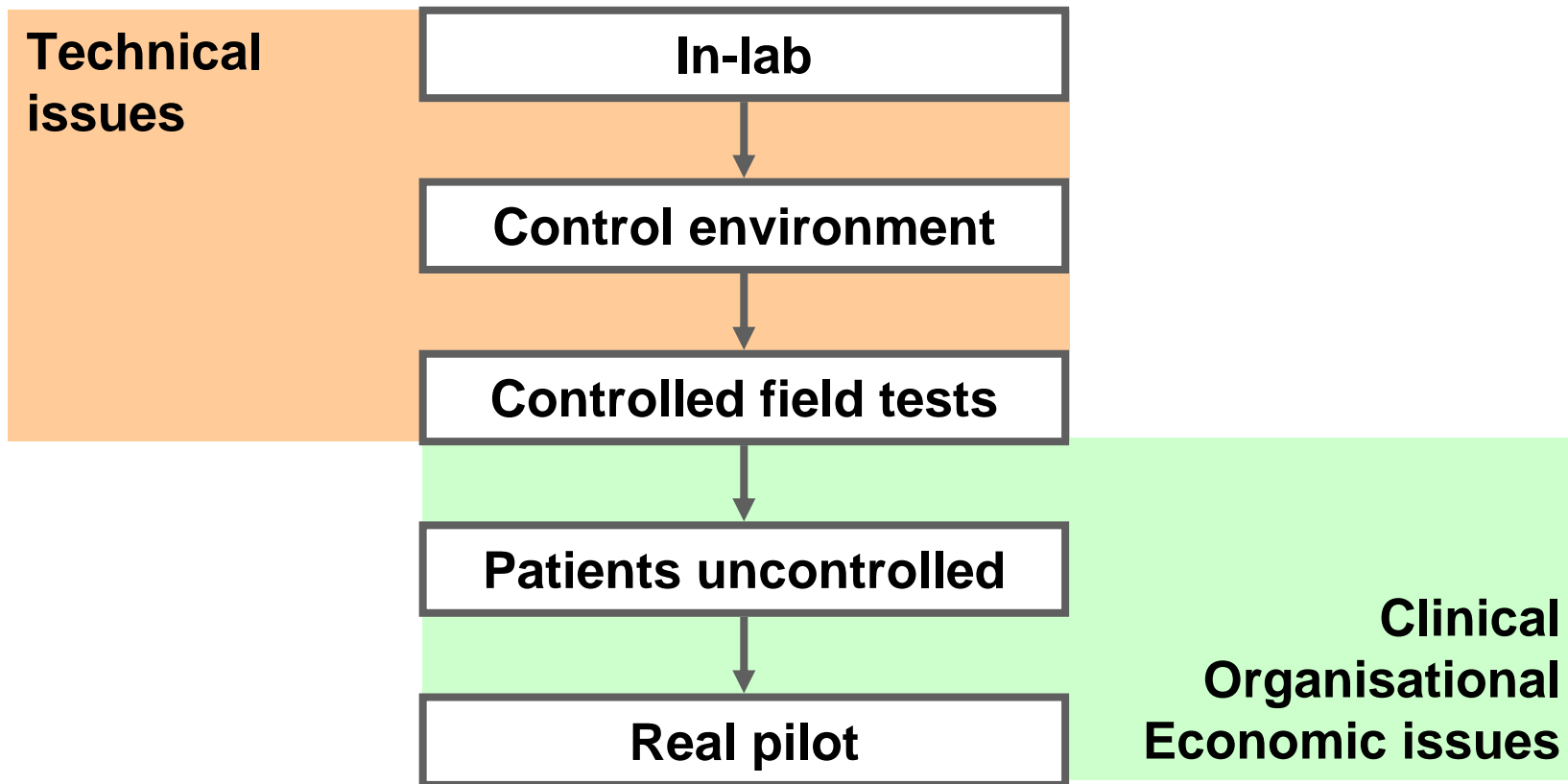
- Earlier discharge and follow-up of cardiac patients admitted for an acute episode
- Follow-up of cardiac patients with suspicion of a condition not fully diagnosed
- 20 patients were trialed



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- Distant monitoring of pregnant women (detection of uterine activity that could forecast delivery within 48 hours)
- 18 patients were trialed

Evaluation

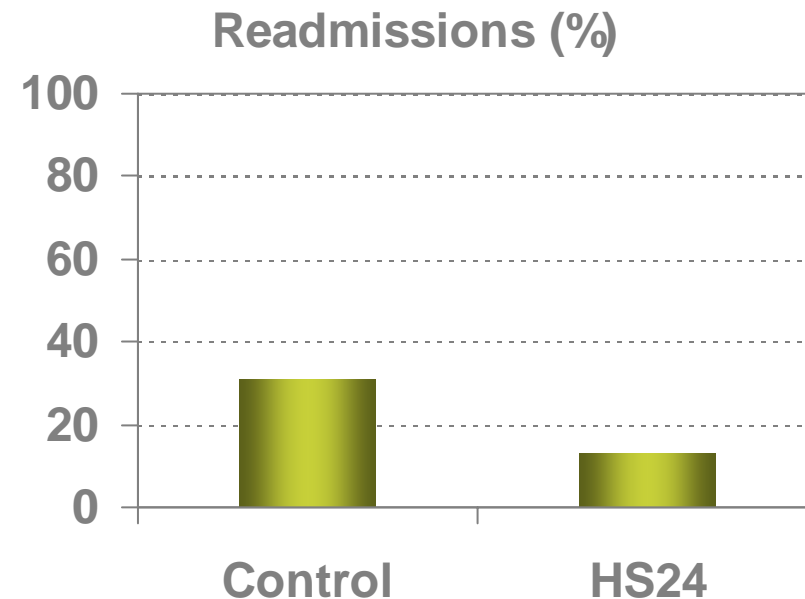
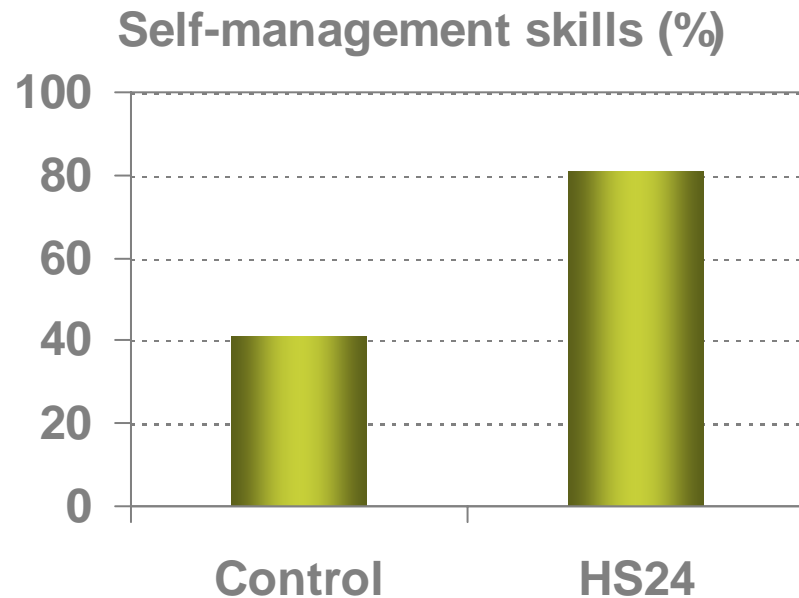




End-user social evaluation

- High satisfaction
- Convenience of use, high acceptance
- Not disruptive with current work practices
- Easy to apply / extend to other areas
- Patients felt more reassured that they were given a higher level of care. E.g. patient could pin point the time that he felt any symptoms using the system, lead to the comprehension that the patient could play a more vital role in his health care supervision
- Professionals satisfaction related to access to patient condition (from anywhere, anytime, any location)

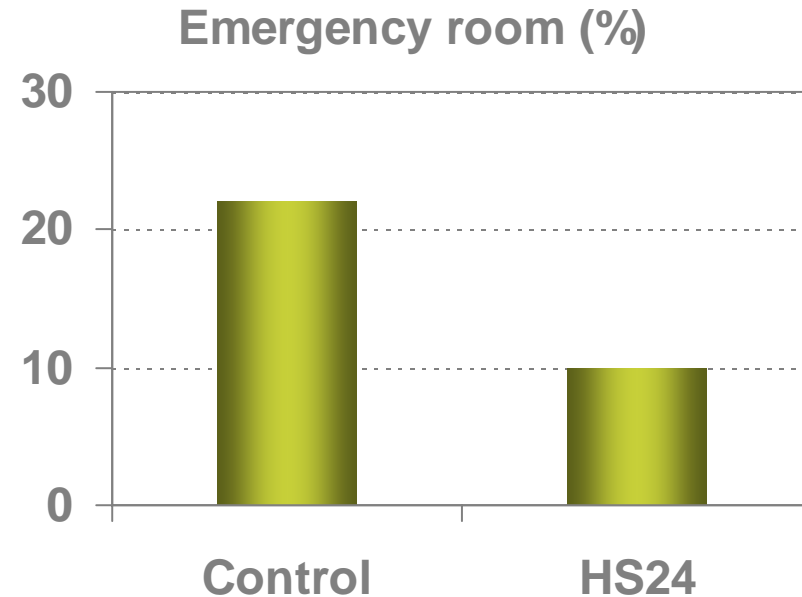
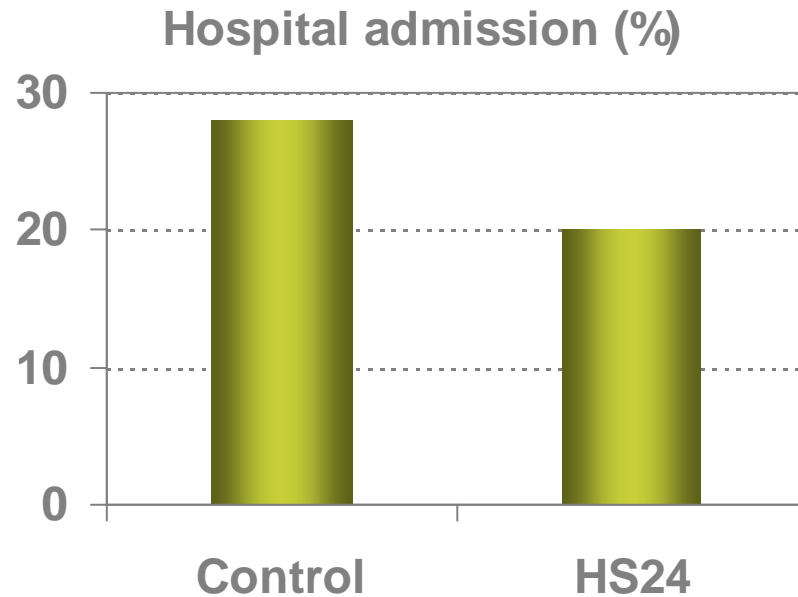
Clinical outcomes (I)



Introducing mobile health monitoring services had a positive clinical outcome. Patients claimed to better understand their disease and thus improved their self-management skills of their condition.

This led to less re-admissions in comparison to the control group.

Clinical outcomes (II)



The number of hospital admissions declined because the HS24 patients felt more reassured about their condition. Also a lower rate in unexpected patient admissions was observed.

The emergency room admissions declined dramatically, which represent a big part of the costs.



Health economics

- Reduction in unnecessary admissions, associated savings in scarce resources
- Higher rate of early discharge observed because patients using the system felt more reassured that they were ok
- Reduction in the use of emergency room care
- Savings in total examination time by experts (by remotely assessing the patient)
- Reduction in travelling costs for patient and relatives
- Less home visits by nurse
- Exact charging scheme for home care still under discussion

Up to 38% of direct costs could be saved by applying the HS24 concept in comparison to conventional treatment



Concluding Remarks



Deployment plans of
HS24 consortium members



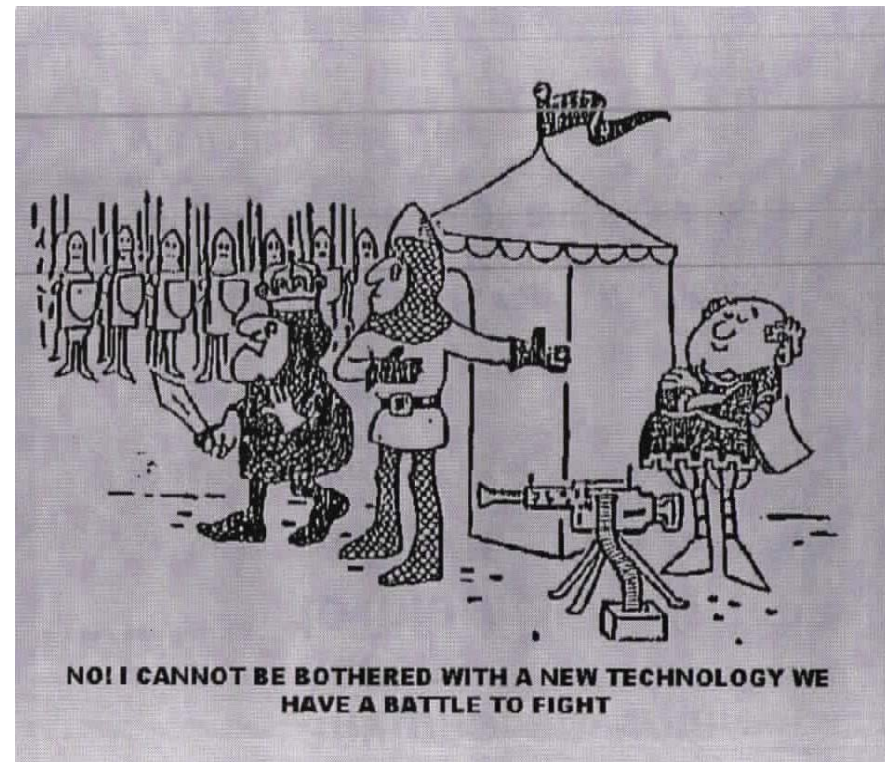
Barriers of entry



- Reluctance of the healthcare players to embrace new technologies, work methods and business processes
- Healthcare is a highly regulated area and difficult to access
- Lack of health-political support
- Potential health hazards from wireless communication technology
- Medical data security hurdles, ethical and legal requirements
- Technology is not enough – management of complex value chains and processes is necessary

Factors of success – technology is not enough

- Adequate market entry-strategy, taking into account all value chain players and providing respective business models and benefits
- Integration of e- and m-health
- Complete system offer, providing end-to-end services and solutions
- Straight-forward, easy to handle and robust solutions
- Availability of good medical and health-economic validation data and proof of concept on customer site



Where are the HS24 consortium partners heading now ?



- **ERICSSON** has a CE-certified product on the market– Ericsson Mobile Health – available for commercial rollout worldwide. Ericsson will continue development of further functionalities
- **YUCAT** offers a MBU software platform that can be used in different mobile measurements settings
- **Twente Medical Systems International** offers different models of the BAN-research system and has developed a telemedicine device for monitoring pace-maker patients



Where are the HS24 consortium partners heading now ?



- **University of Twente**

- has created an eHealth laboratory for knowledge valorization purposes
- Main target is to provide a mHealth services platform for niche markets that does not compete with full commercial services
- Proof the generic mHealth services platform in hospital and research institutes



- **Medisch Spectrum of Twente**

- Study conditions that can predict labour and develop algorithms that can be embedded
- Obtain a patent
- Commercial development and deployment



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Where are the HS24 consortium partners heading now ?



- **University of Cyprus / LITO Polyclinic**

- Reorganization of current clinical practices related to the cardiac patients' service provision in order to integrate the HS24 mobile solution into the clinic processes as the regular equipment for home care (main target until 2008). If successful, expansion to other conditions likely.



University of Cyprus

- **Hospital Clínic Provincial de Barcelona**

- Integration of HS24 mobile monitoring solution as the regular equipment for monitoring patients within the institutional integrated care program
- HCPB plans to combine the mobile monitoring service with an already existing patient management system in the area of lunge diseases, especially COPD



HealthService24 contacts



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www.healthservice24.com



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THANK YOU
