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Anticipating emerging and future risks from the project "Being diabetic in 2011"

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Toulouse, 7 et 8 juin 2010

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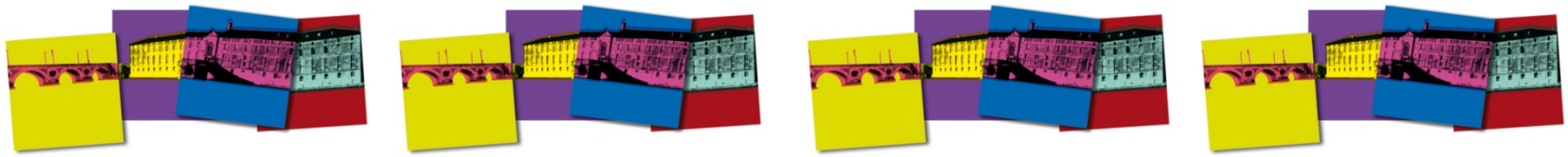
Outline

- ENISA and the EFR working group
- Motivation: eHealth use cases
- Product and standardization
- Being Diabetic in 2011 scenario
- Assets, vulnerabilities, threats…
- Major risks
- Conclusions



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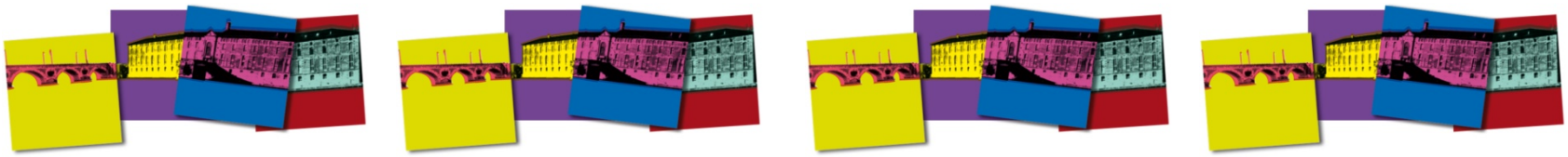
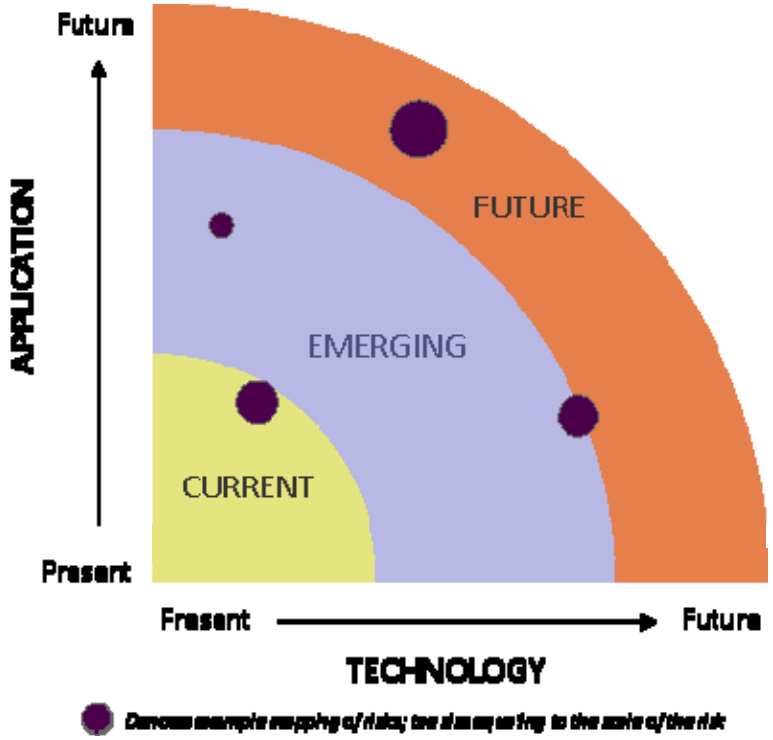
European Network and Infromation Security Agency

- Main objective:
  - Assist the Commission and the Member States to meet the requirements of network and information security
- Tasks
  - Advising
  - Collecting and analyzing data on incidents
  - Promoting risk assessment
  - Awareness-raising and co-operation



The EFR Framework – *Emerging & Future Risks*

- Existing methodologies focus on current risks
- Need to be proactive
- Need for a structured approach to assess and manage EFR
- Time-wise:
  - Current: *Now - 1 year*
  - Emerging: *1-5 years*
  - Future: 5+ years



EFR Pilot – *Why eHealth?*

- Very important area…
- Lots of potential – offers many benefits for healthcare:
  - Limits costs, improve productivity
  - Improve health service
  - Reduce medical error
  - Alleviate unnecessary care
- However, it is controversial: entails risks…

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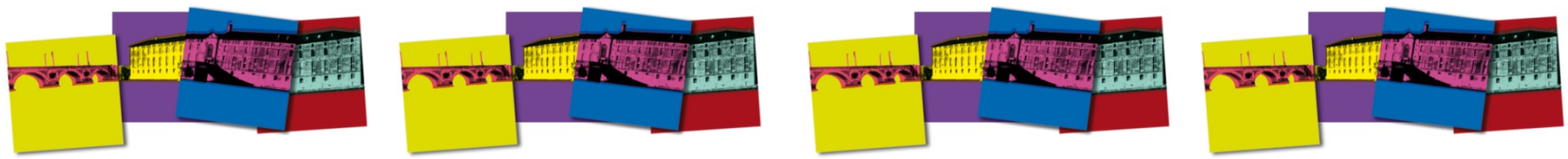
Vision video



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Philips Home Monitoring

Bridging the Hospital and the Home

Medical Alerts

PHILIPS
Lifeline

Cardiac Monitoring

PHILIPS
RAYTEL
CARDIAC SERVICES

Chronic Care Mgmt.

PHILIPS
Telehealth

Technology-enabled services to address the
challenges of chronically-ill people living-independently.

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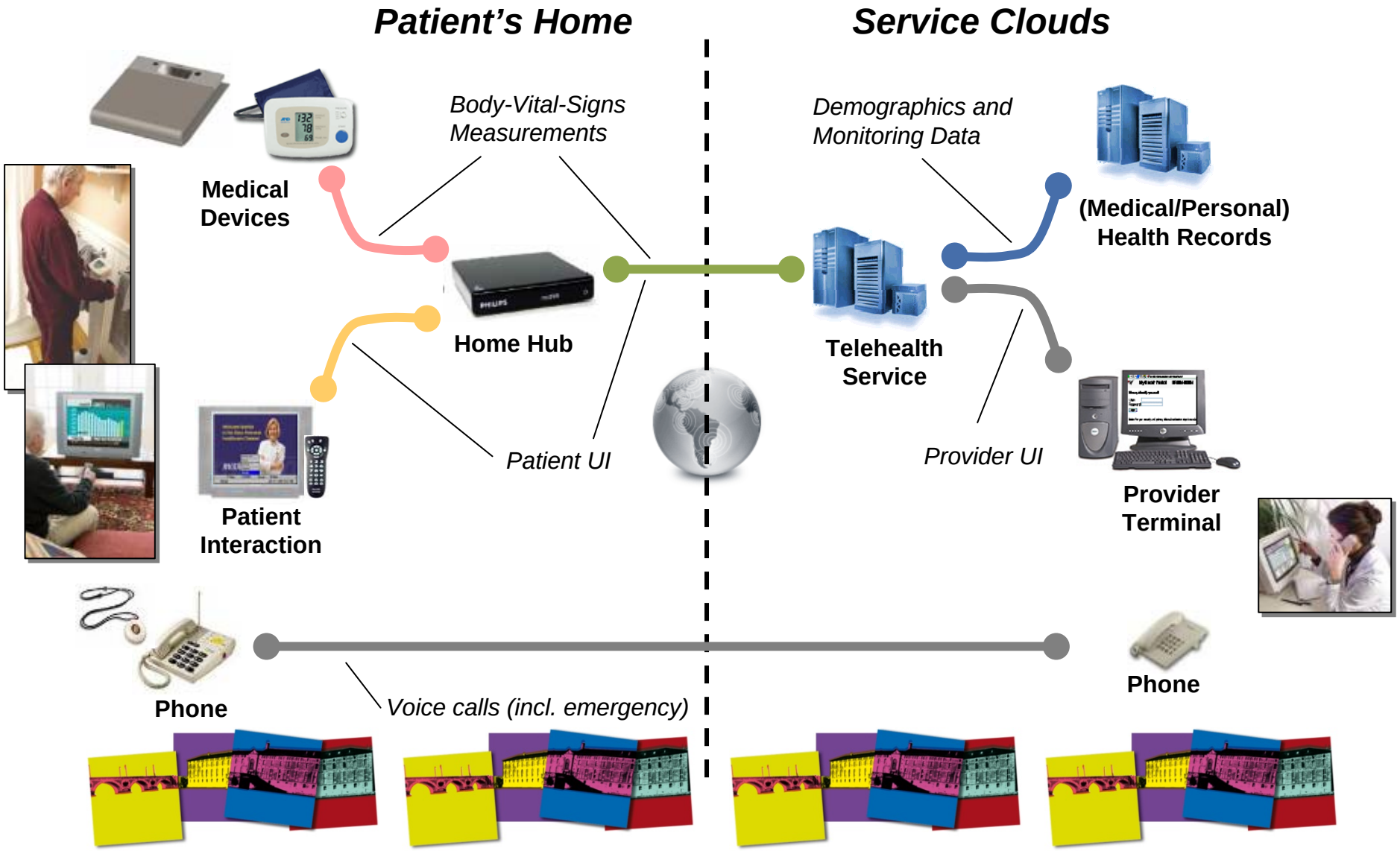
Remote monitoring solution

System overview



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The Continua Health Alliance

A non-profit, open industry alliance of the finest healthcare and technology companies in the world joining together in collaboration to improve the quality of personal healthcare

"Enabling connected personal health for the world"

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HEALTH ALLIANCE

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A&D Medical

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Life-Saving. Cost-Saving.

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BODYMEDIA

Center for ConnectedHealth

CISCO SYSTEMS

DYNASTREAM INNOVATIONS

GE Healthcare

EATON

Healthe

HOMEDICS
Products That Touch Lives™

IBM

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KAISER PERMANENTE

Living Independently Group, Inc.

Medtronic

NHS Connecting for Health

NOKIA
Connecting People

NONIN

OMRON

Panasonic
ideas for life

PHILIPS

Pfizer

POLAR
LISTEN TO YOUR BODY

PRICE WATERHOUSE COOPERS

Roche

SAMSUNG

SHARP

SIEMENS

Sprint
Together with Nextel

ST. JUDE MEDICAL

TECHNOGYM
The Wellness Company™

TELUS
the future is friendly

TEXAS INSTRUMENTS

Tunstall

WelchAllyn

ZYDACRON

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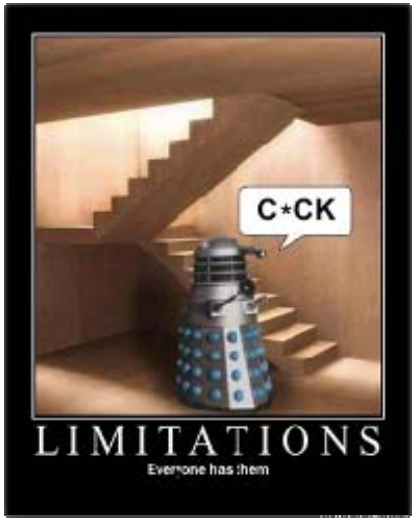
EFR Pilot – *Objectives, Scope and Limitations*

Objectives:

- To identify major emerging and future risks of the remote health monitoring
- To obtain feedback on the EFR Framework, so that it could be updated and improved

Scope and Limitations:

- Scenario building and risk identification based on assumptions
- No time for recommendations



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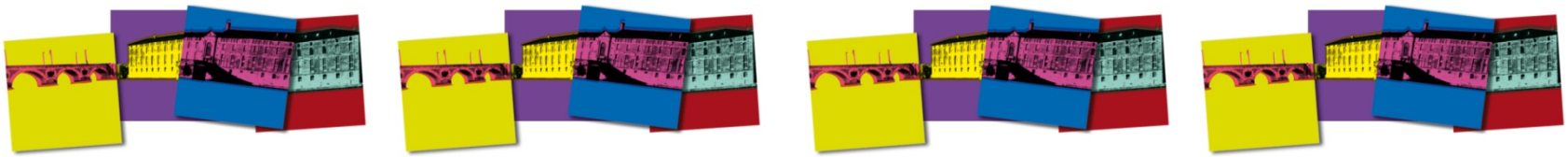
'Being diabetic in 2011' – *Framing the scenario*

- **When**: 3 years into the future
- **Who**: Ralph: a 58-year-old diabetic (type II), overweight, his family, his doctor, hospital, data and call centre
- **Where**: home, office, hospital, medical office...
- **What**: diabetic management program, health data, applications, sensors, IT systems…

Analysing the scenario – *Risk Assessment*

- Identify and valuate assets (values, rights, systems, services…)
- Identify and assess vulnerabilities (of assets)
- Identify existing controls
- Identify and assess threats
- Determine impacts
- Use following equation to identify and assess risk

Risk = f(Vulnerability, Threat, Impact)



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What are we trying to protect? – *The assets*

INTANGIBLE

- Health and life
- Human rights and social values
- Autonomy
- Personal data
- National healthcare system
- Mobility

TANGIBLE

•Health cards
•Health monitoring devices
•Personal information technology equipment
•Data centres and call centres
•Electronic health records (EHR)
•Health journal
•Electronic prescriptions
•Public health research data
•Hospital information technology systems
•Networks

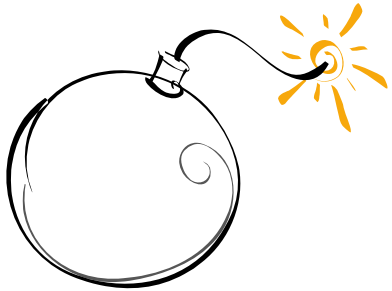
Vulnerabilities and threats

Vulnerabilities

- Critical parts of the monitoring/ treatment process are becoming responsibility of the patient.
- Lack of or inadequate identification & authentication controls
- Lack of data traceability. The Patient cannot be aware when his data where accessed, by whom and why.
- …

Threats

- Patient does not follow the instructions for equipment use, treatment, medication
- Breach of confidentiality and/or integrity. Eavesdropping/ spoofing/deletion on the interfaces
- Unauthorized use of measurement devices
- …



Identifying risk areas…

"*Security of the e-health system and the prospects for breaches in a system that would hold sensitive data on every person in the country*" – imagine the consequences…

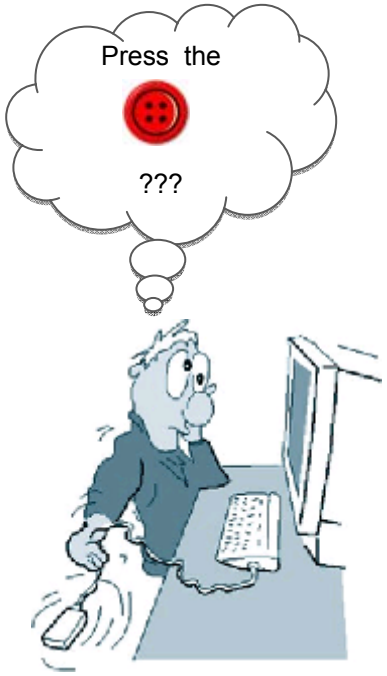
"*'Informed' consent is a minefield on its own*": easily overridden

"*Who is going to have the right to access all those electronic health records? Will it include insurance companies, employers, credit-checking companies?*"

"*Shifting too much responsibility for care to individuals*"…

Identifying risk areas…

"Some people would not take the time to understand the choices or their implications, some would be intellectually challenged and of doubtful competence to make such a determination…"



"Reuse all those data for some other purposes not explicitly stated when the data are collected from patients and doctors"

"How can you ensure that the data in an e-health system will be correct?"

Major risks in a nutshell

- Failure to comply with informed consent legislation
- Failure to comply with data protection legislation
- Data breaches
- Repurposing or secondary use of data (mission creep)
- Disruption of service (e.g. unprofessional use of equipment, flaws in system)
- Discrimination / Social profiling and exclusion
- Misinterpretation or errors in collecting and handling medical data
- Privacy, autonomy breach

- **IMPORTANT**: *Many inter-relations among these risks!!!*

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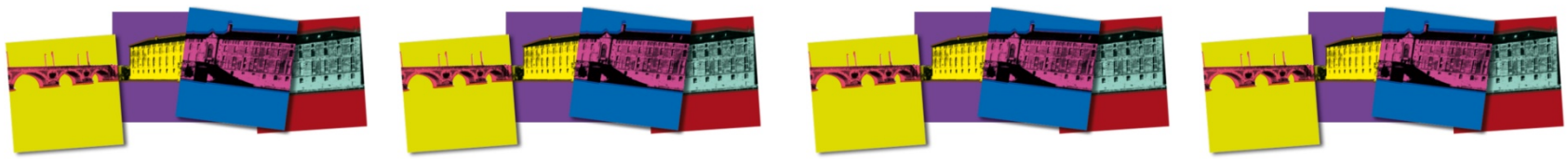
Complete report

Being diabetic in 2011

Identifying emerging and future risks in remote health monitoring and treatment

http://www.enisa.europa.eu/media/press-releases/remote-health-monitoring-scenario



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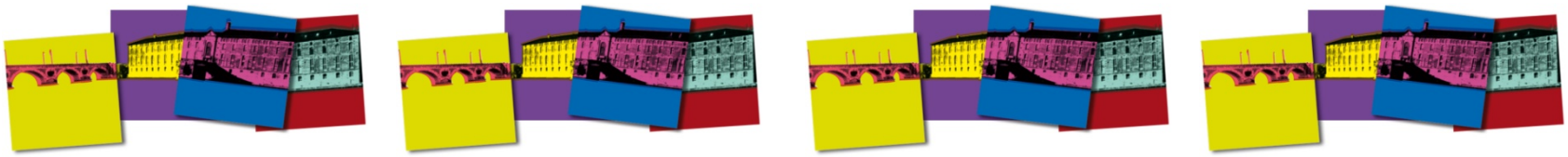

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To conclude...

YES!

eHealth solutions are promising and beneficial!

BUT...

There are **important risks** posed that need to be addressed

SO...

CAUTION is the prudent answer

WHO?

EU institutions, public sector, industry, academia...