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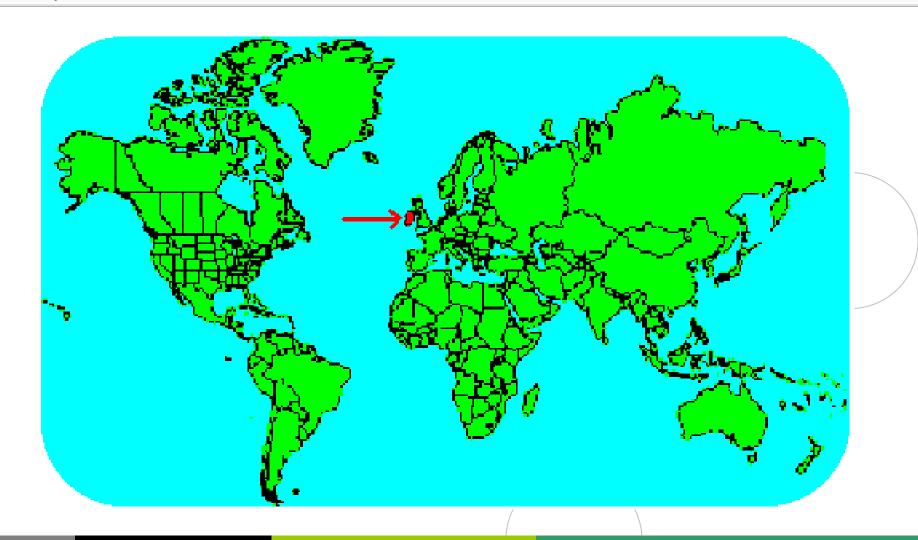




Where is Ireland?



Digital Enterprise Research Institute





Where is Galway?



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Our Mission and Vision



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DERI Galway's Mission is "to exploit semantics for

- People
- Organisations
- Systems

to collaborate and interoperate on a global scale"

DERI Galway's vision is "to be recognised as being among the leading international web science research institutes interlinking technologies, information and people to advance business and benefit society"



Some Statistics



Digital Enterprise Research Institute

- Founded June 2003 with 1 fulltime member (green field)
- Status November 2008: about 130 members and growing
- Research Publications > 370
 - □ No 1 organisation in its core space
- Core Industrial partners: Cisco, Nortel, Ericsson, IBM, ...
- Participates in 12 standardisation groups
- Total Research Grants: about 38 M Euro so far
- Research Approach:
 - "Learn from the Web", generate impact
 - □ Research and Standardisation
 - Dissemination via Open Source, Industry collaboration

On the shoulders of giants...



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Memex (Vannevar Bush)

A memex is "a device in which an individual stores all his books, records, and communications."

Augmenting Human Intellect

(Doug Engelbart)

"By 'augmenting human intellect' we mean increasing the capability of a man to approach a complex problem situation, to gain comprehension to suit his particular needs, and to derive solutions to problems."

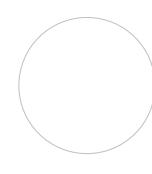
WWW (Tim Berners-Lee)

"There was a second part of the dream [...] we could then use computers to help us analyse it, make sense of what we re doing, where we individually fit in, and how we can better work together."





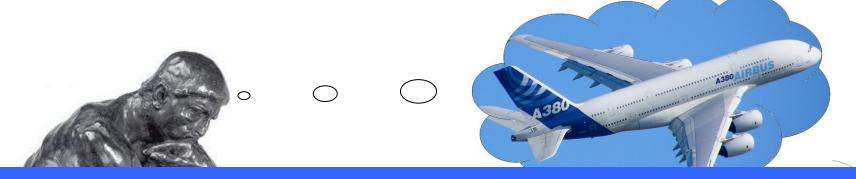




It wasn't the time then...



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Where are we now?







Now we are making progress...



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A Network of Knowledge



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- Interconnected
- Universal
- All encompassing



- Enable global and local collaboration
- The right information for the right people at the right time





- Collaborative access to networked knowledge assists with collective problem solving
- enabling innovation and increased productivity
- individual, organisational and global levels

 Inspired by Doug Engelbart's

original 1962 report of: AUGMENTING HUMAN INTELLECT: A CONCEPTUAL FRAMEWORK



Getting to work: The DERI House



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Application-Oriented Research Domains

- eBusiness & Financial Services
- Health Care & Life Sciences
- eLearning
- Telecommunications
- eGovernment
- eScience

Social Semantic Information Spaces

- Web 2.0 and collaborative systems
- Semantic Web
- Web Science
- Linked Data

Semantic Reality

- Sensor Networks
- RFID
- Mobile computing
- SOA



Networked Knowledge - Part 1



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Social Connectivity

Collaboration and Communication Tools

Blogs, Forums, OSNs, Wikis



World Wide Web

URIs, HTML, HTTP

Social Semantic Information Spaces Web, Desktop



Web Semantics RDFS, OWL, SPARQL, microformats

Semantic



Syntax

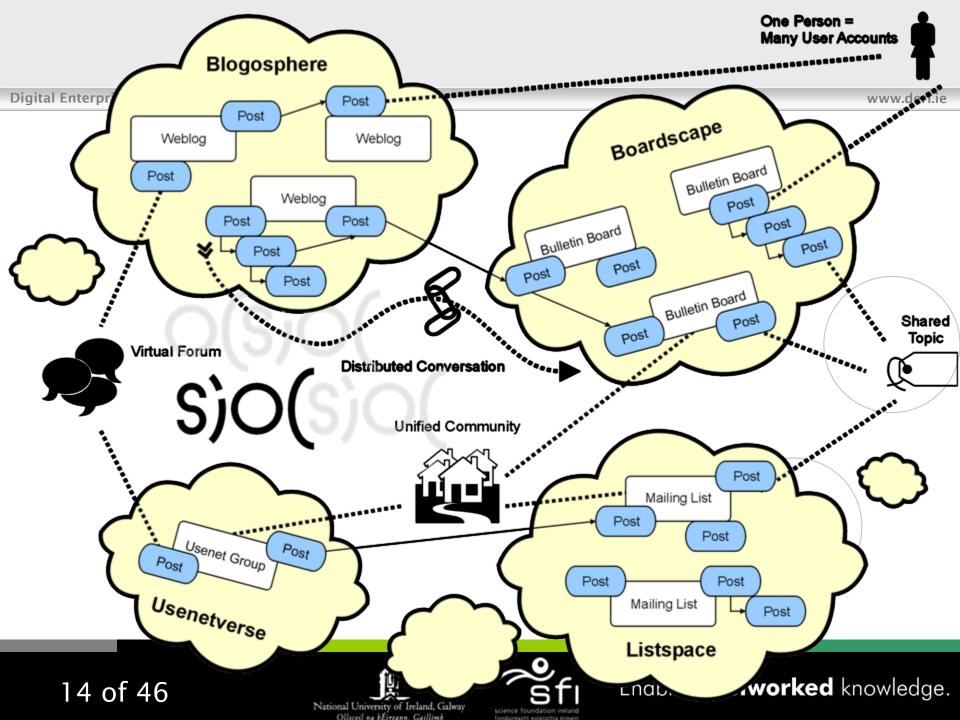


Semantic Interlinking of Online Community Sites (SIOC) – Seeding a Standard





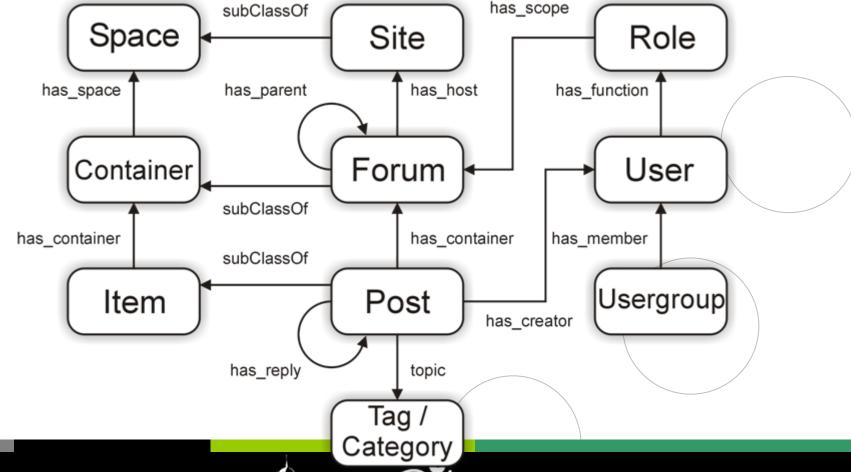




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■ The main classes and properties are:



The SIOC food chain



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Producers

Add-Ons and Fns for Exporting SIOC from Existing Apps

SIOC from Semi-Structured Data or Queryable APIs

Applications with Native Storage of SIOC Data

Bypassing Apps by Directly Mapping RDBMS to SIOC

Collectors

SIOC Crawlers and Aggregate Storage of Data

Indexers of SIOC Instances w/o Full Storage

S)O(

Food Chain of Applications

Consumers

RDF Browsers and Other Custom SIOC Explorers

SIOC Detectors and Clipping Applications

Reuse and Import for Data Portability Requirements

Graphical Vis of Derived SIOC Networks





List of some SIOC implementations



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Creating SIOC data

- SIOC APIs
 - □SIOC Export API for PHP*
 - □SIOC API for Java*
- Weblog, forum and CMS exporters
 - □WordPress SIOC Exporter
 - □Dotclear SIOC Exporter*
 - □b2evolution SIOC Exporter
 - □Drupal SIOC Exporter
 - □phpBB 2.x SIOC Exporter
 - □Triplify*
- Other exporters
 - □OpenLink DataSpaces*
 - □TalkDigger*
 - $\square SWAML*$
 - □Mailing List Archives*
 - □Mailing List Exporter*
 - □Twitter2RDF*
 - □IRC2RDF*
 - □Sioku (Jaiku2RDF)
 - □gnizr*
 - □OpenQabal*
 - □BlogEngine.NET*

Using SIOC data

- SPARQL endpoints, querying SIOC data
 - □ODS demo server and MyOpenLink.net*
 - □#B4mad.Net SPARQL endpoint*
- Crawling and browsing SIOC data
 - □SIOC Crawler
 - □SIOC Browsers* and SIOC Explorer
 - □Buxon*
- Using SIOC for new data
 - □Fishtank*
 - □BAETLE*
 - □RDFa on Rails*
 - □lkeWiki*
 - □int.ere.st
 - □OpenLink Virtuso AMI*
 - □Talis Engage*
- Reusing SIOC data
 - □IKHarvester, notitio.u\$ and JeromeDL
 - □BSCW*, BC*, Corona*

SIOC utilities

- Finding and indexing SIQC data
 - □Semantic Radar





Comment from Toadie

Date: March 18, 2008, 1:28 pm

soo, whats the link support about. Like w

when then? will the effect be different the

Dashboard

moderators for your continued support.

boards.ie has increased its daily visits from 30k per day in November 2005 to

around 60k per day at present. Thanks to all our readers, posters and Co-chair of BlogTalk 2008.

Semantic Web and social software

ounder of the SIOC project

Creator of WebCamp.

+1-415-287-0222. This site contains John's personal opinions, unrelated to the views of his

Semantically-Interlinked Online Also blogging at SocialMedia.net

Contactable at skype:johnbreslin or via Skype In / voicemail on

Adoption of SIOC









Semantic Collaboration on the Desktop





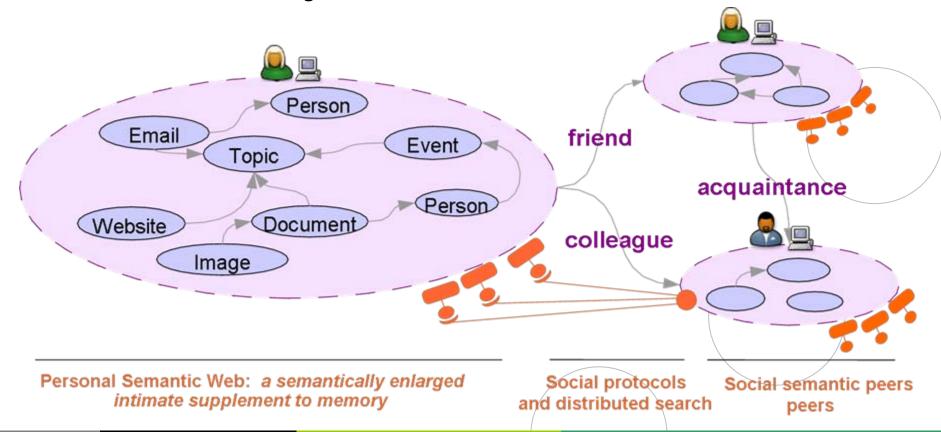
Social Semantic Desktop

Realization



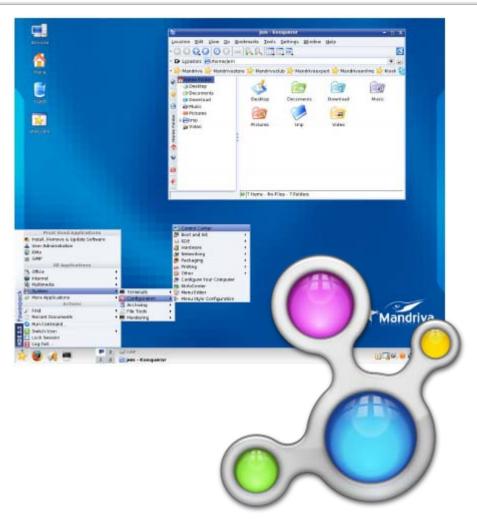
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- Desktop: Help individuals in managing information on the Web / their PC
- Semantic: Make content available to automated processing
- Social: Enable exchange across individual boundaries



Prototype Linux/KDE Semantic Desktop





- Open Source
 - □ Involvement of KDE developers - Early **Adopters**
 - □ Semantic OS
- Core Technology of the Semantic Desktop:
 - □ PIMO, RDF Data store, Wrapper
- Part of the official KDE 4
 - □ Millions of installations
 - □ Semantic Web Technology on every KDE computer
 - □ Virulent effect
 - □ Creation of a market



Ollscoil na hÉireann, Gaillim



A Network of Knowledge



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Semantic Reality

Deliver the right information to the right people at the right time!

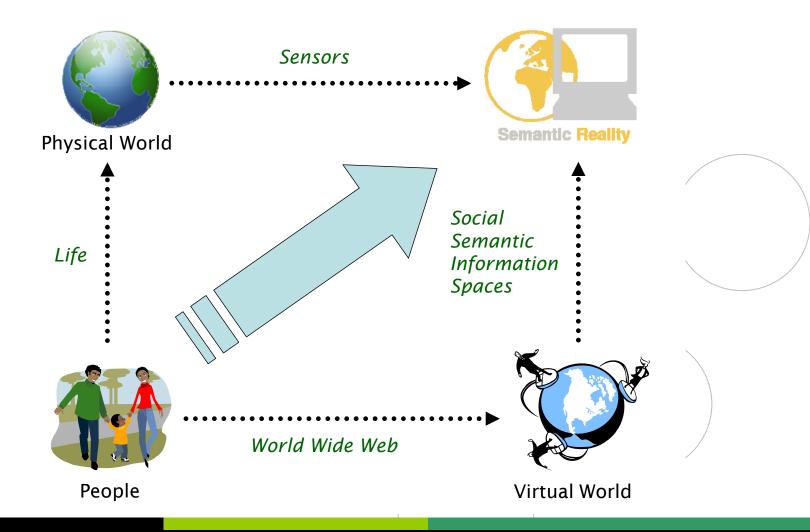




Semantic Reality



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Sensors are coming ...

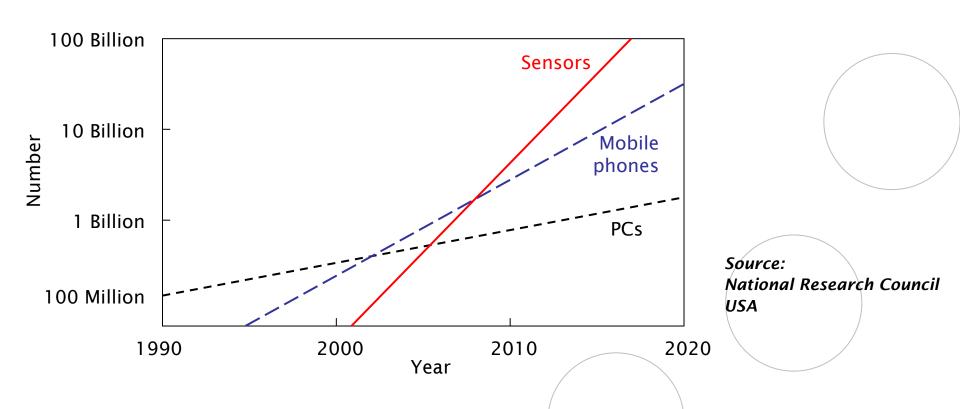


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"Soon we'll have trillions of sensors, ..."

Michael R. Nelson, Director of Internet Technology and





Why are sensors so interesting?



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Sensors enable us to bridge the gap between computers and the real world

- Applications
 - can become aware of their physical environment
 - can interact with it
 - □ can influence it

Integration with Information on the Web!

Deliver the right information to the right people at the right time!





Challenges and Opportunities



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<u>Challenges</u>

- Scale
 - Number of producers and consumers
 - Amount / rate of data produced / consumed
- Time-dependant Information
- Semantic Modelling of Sensors and Sensor Data
- Storage and Querying of Dynamic Information

<u>Opportunities</u>

- To access structured sensor data provided by users, smart spaces and existing sensor networks
- To offer enhanced services to users based on that data's relevance and timeliness









Context Server Architecture



Digital Enterprise Research Institute www.deri.ie GAP **Enhanced** User-specific **Smart-Space** Services contextual data **HTML REST** Interface Interface Controller Model Reasoning **Engine** Policy & lena **Profile** RDB **RDF** Store

Ontologies



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- Location
 - □ GeoNames ontology
 - ☐ Extended to include "Building", "Floor", "Room" etc...
 - ☐ Goes beyond simple <IP-Location> mappings
- Calendar
 - □ iCal
 - ☐ EVENT, TODO, FREEBUSY
- FOAF
 - □ Name, email address
 - □ Friends, interests
- Users define and control their own context management policies
 - ☐ On a per smart space basis
- Constraints can be placed on individual aspects of a users profile
 - □ Conditions
 - Granularity
 - Ranges



Semantically Enabled Sensor Middleware



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- Semantic descriptions of the information and information sources
 - ☐ Type, structure, meaning, position, behaviour over time, etc.
- Secure storage, access and privacy
- Large-scale, scalable, self-managing infrastructures

Global Sensor Networks (GSN)

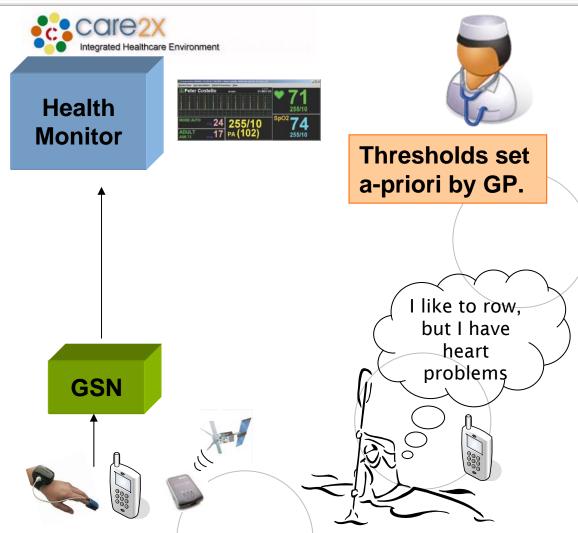
→ gsn.sourceforge.net joint work with





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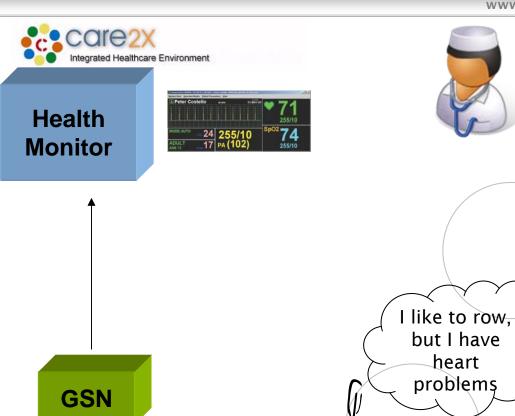




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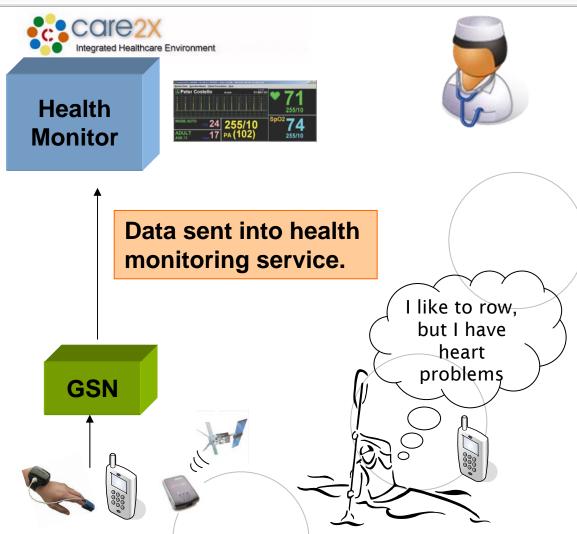
Data generated by biomedical sensor.





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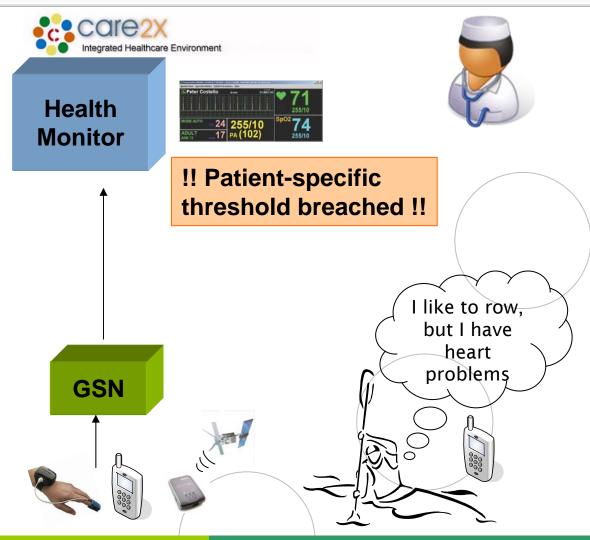






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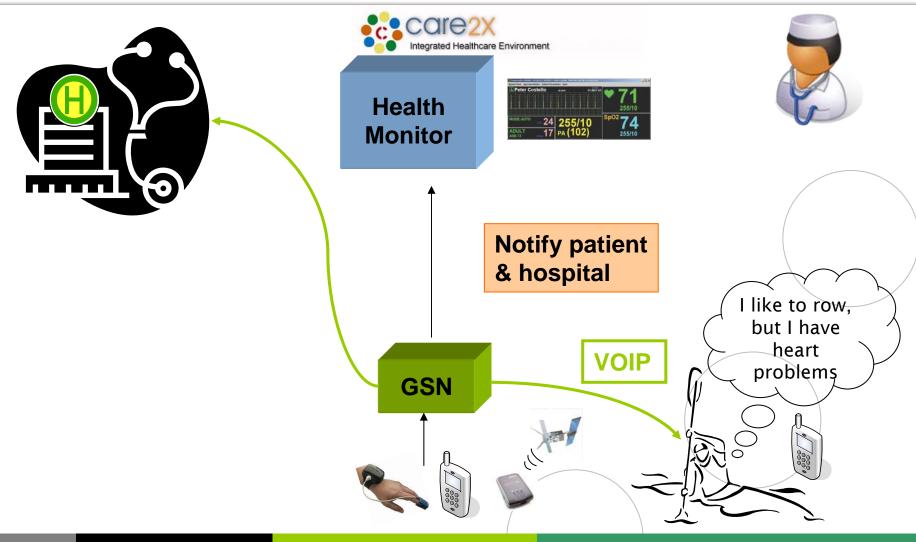








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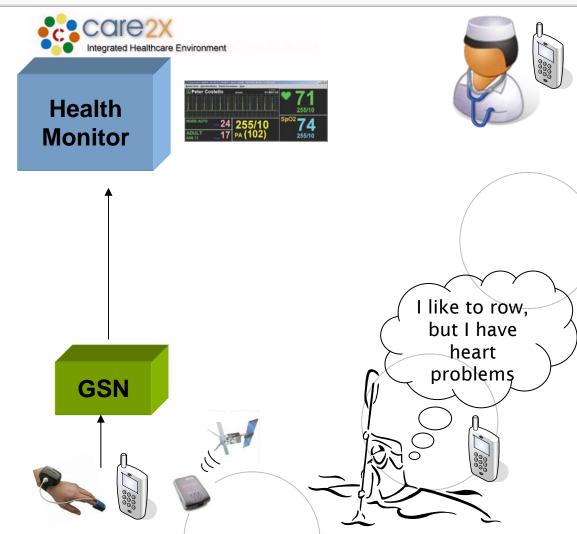
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Locate patient & find closest doctor on duty.









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Networked Knowledge



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A global task ...

but we are not alone...

- many trends point into the same direction
- we get supported by many individual efforts
- collaboration across domains / disciplines is essential

