

Wireless Biosensor Testbed

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Definition

*A **testbed** is a platform for experimentation for large and complex development projects, which allows for rigorous, transparent and replicable testing of scientific theories, computational tools, and other new technologies in realistic settings.*

Source Wikipedia



Testbed for biosensor and sensor networks

Goal:

Establish a qualified technical and clinical test environment to test and verify new ideas, concepts, prototypes, products and projects submitted by

- Individuals, who are inventors, innovators, entrepreneurs
- start-ups
- small, medium, and large enterprises (SME/LE)
- (other) hospitals
- research institutes
- academia



Motivation

- For external entity
 - One contact point within Rikshospitalet, which will be highly professional to handle their projects from start to end
 - A potential place to work with medical specialists, engineers and product developers
 - A meeting place to demonstrate the products/solutions to end users (e.g. companies, medical professionals, etc.)
 - A permanent showcase for their solutions
- For IVS
 - Professional way to handle all contacts from an external entity
 - Increase IVS's core competency in biosensors and sensor network and professionalize its expertise
 - Stimulate innovation and commercialization of research ("translasjonsforskning")
 - Possibility to increase # of publications, PhDs, IPs, etc



Organization

- Testbed shall physically be located at IVS
- Testbed can be organized as either
 - a project within the matrix structure of IVS, or
 - an independent public company co-owned by industry, institutes, hospital, Medinnova, etc.
- Testbed will have a manager to
 - handle all external contacts and projects
 - establish project organization to perform different projects
 - negotiate contracts and business proposals
 - handle legal issues



Funding

- The testbed will have a minimum, basic funding (“grunnfinansiering”) for the manager and infrastructure through:
 - overhead from the external projects and/or
 - permanent funds allocated by
 - Ministry for health services/Ministry for industry & commerce
 - Innovation Norway
 - Research Council
 - Health Region South-East
- Projects within the testbed will have its own financing schemes:
 - Industry: cash payment
 - Start-up/individuals: cash payment or payment in terms of shares or other terms agreed upon
 - New ideas/concepts: apply for R&I grants - Innovation Norway, Nordic Innovation Center, Research Council, Health Region South-East, etc.



Collaborators

- Internal
 - Clinical engineering department (MedTek)
 - IT-department
 - Other clinical departments
 - Medinnova
- External
 - SINTEF ICT
 - Oslo school of architecture and design
 - NEMKO
 - Det norske veritas (DNV)
 - Dept. of informatics, University of Oslo
 - Dept. of electronics & telecommunications, NTNU
 - Vestfold University College
 - etc



Customers

- Individuals from enterprises (SME/LE) and start-ups
- Inventors, innovators, entrepreneurs
- Scientists from hospitals, institutes and academia



Services/deliverables (“leveranser”)

- Consulting
 - Laboratory testing (IVS, MedTek)
 - Support to perform clinical and technical experiments, statistical and signal analyses on aggregated data, robustness of wireless networks, patient mobility in wireless networks, etc. (IVS)
 - Limited approval of patient confined medical devices (MedTek)
 - Roadmap in terms of CE approval by NEMKO, etc. (MedTek)
 - Advise on IP, productization and commercialization (Medinnova)
- R&D
 - Active R&D collaborator in designing, developing and testing of new biosensor systems and clinical applications (IVS, MedTek, SINTEF)
 - Dissemination in terms of scientific and popular publications



Resources

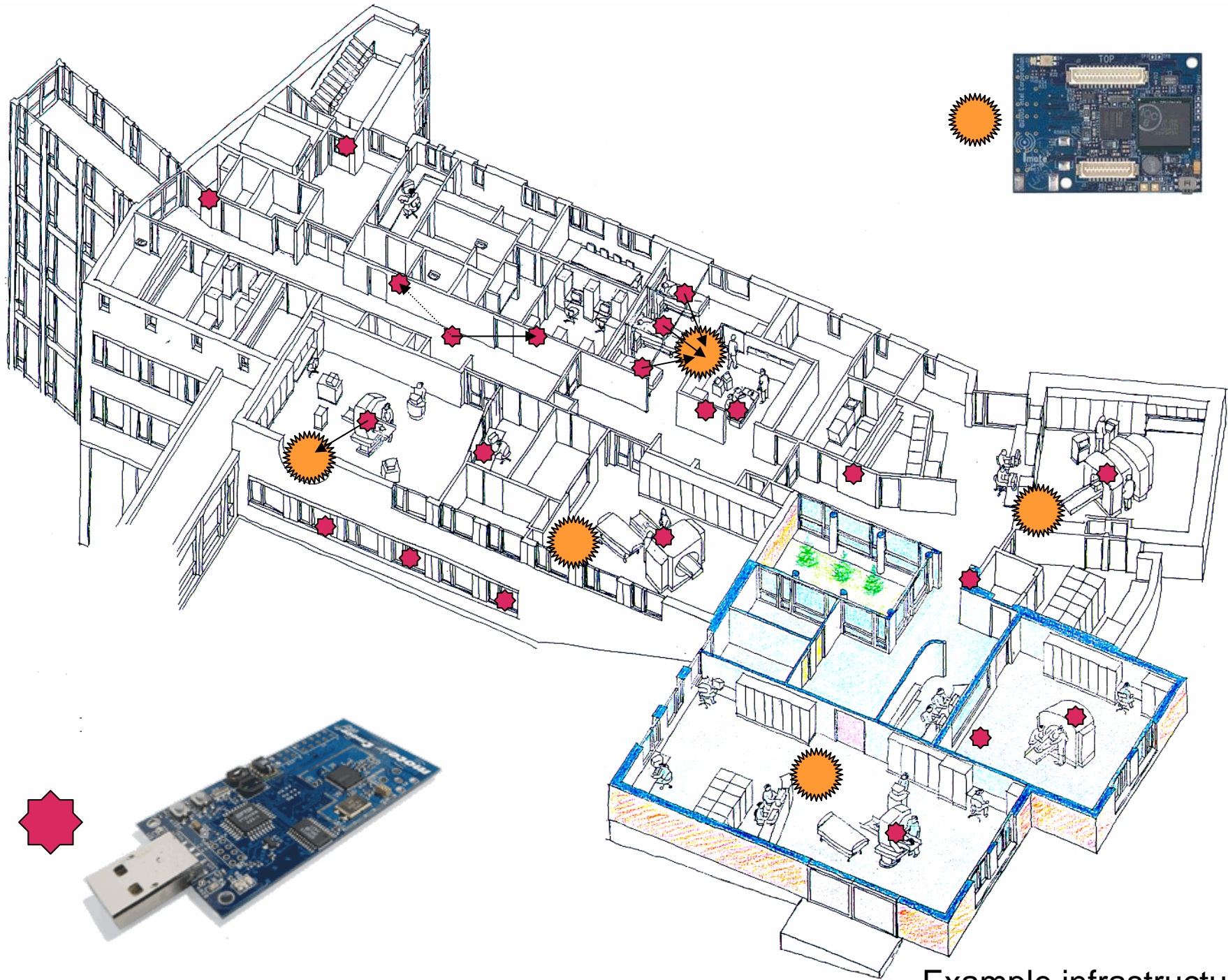
- Facilities
 - Sensor-laboratory: Lab tests (MedTek)
 - Analysis/communication laboratory: analysis of sensor data from technical, clinical and patient mobility experiments (IVS)
 - 3 OR (animal/patient), 1 OR (animal): clinical studies (IVS)
- Equipments/tools
 - Test equipment to approve patient confined medical devices (MedTek)
 - “Plug-and-play” solutions to integrate sensors with wireless networks and associated databases (IVS)
 - Software tools for signal processing, analysis, visualization, etc. (IVS)
- Staff
 - Engineers - IVS, MedTek, SINTEF
 - Clinicians/specialists – IVS, RH
 - OR staff – IVS
 - Business developers – Medinnova



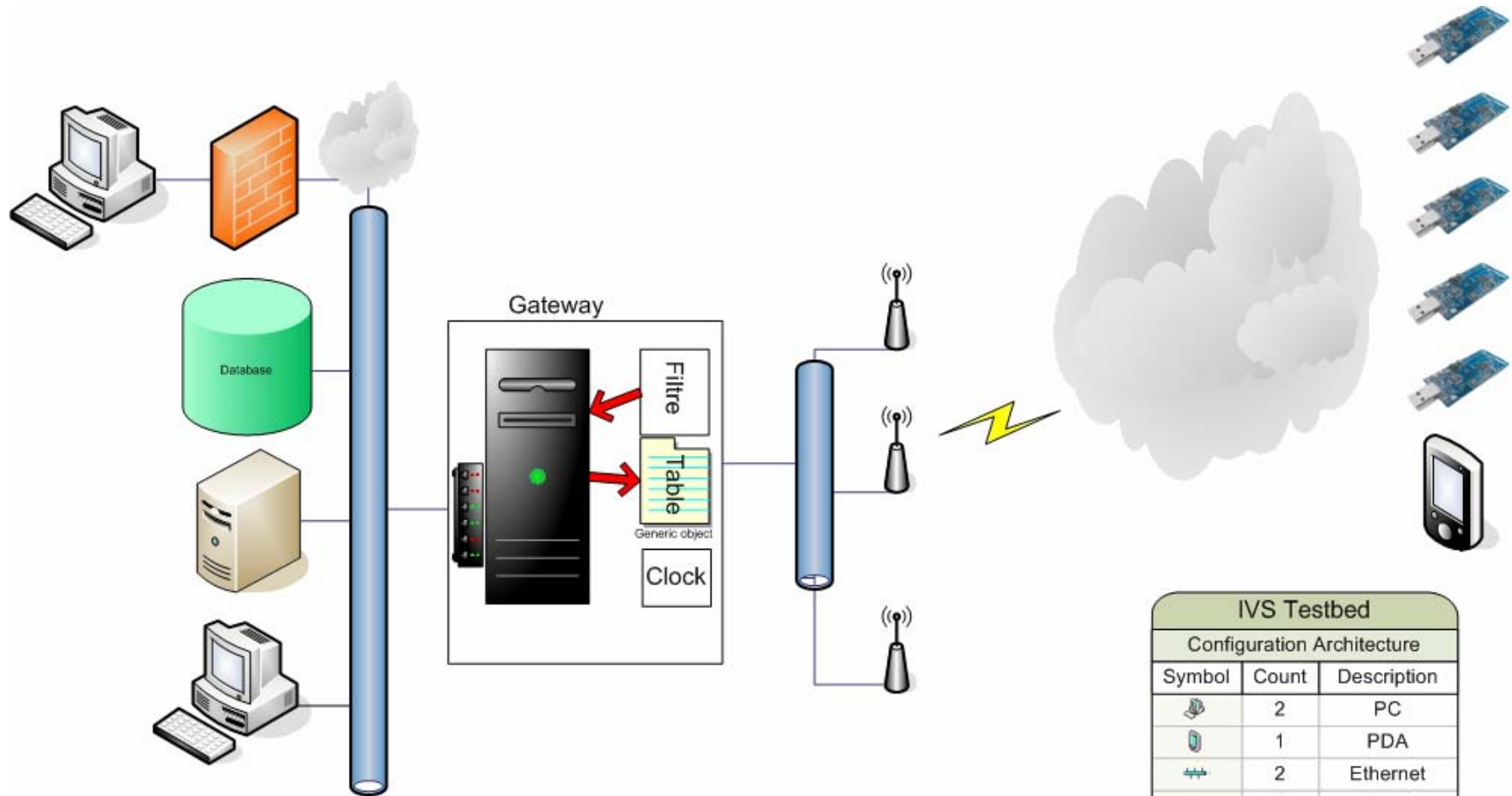
Core areas of interest











- Sensor technology
 - Design of (multifunctional) sensors and associated electronics
 - Rapid prototyping
 - Integration, test strategies
- Information and communication technology
 - Signal processing algorithms
 - Database and middleware
 - Sensor network (novel radio & associated technology)
 - Medical radars (electronics and software tools)
 - In-vivo/ex-vivo wave propagation (electromagnetic, ultrasound)
- Clinical trials (design, execution, analysis, publication)
 - Lab model
 - Animal model
 - Human model





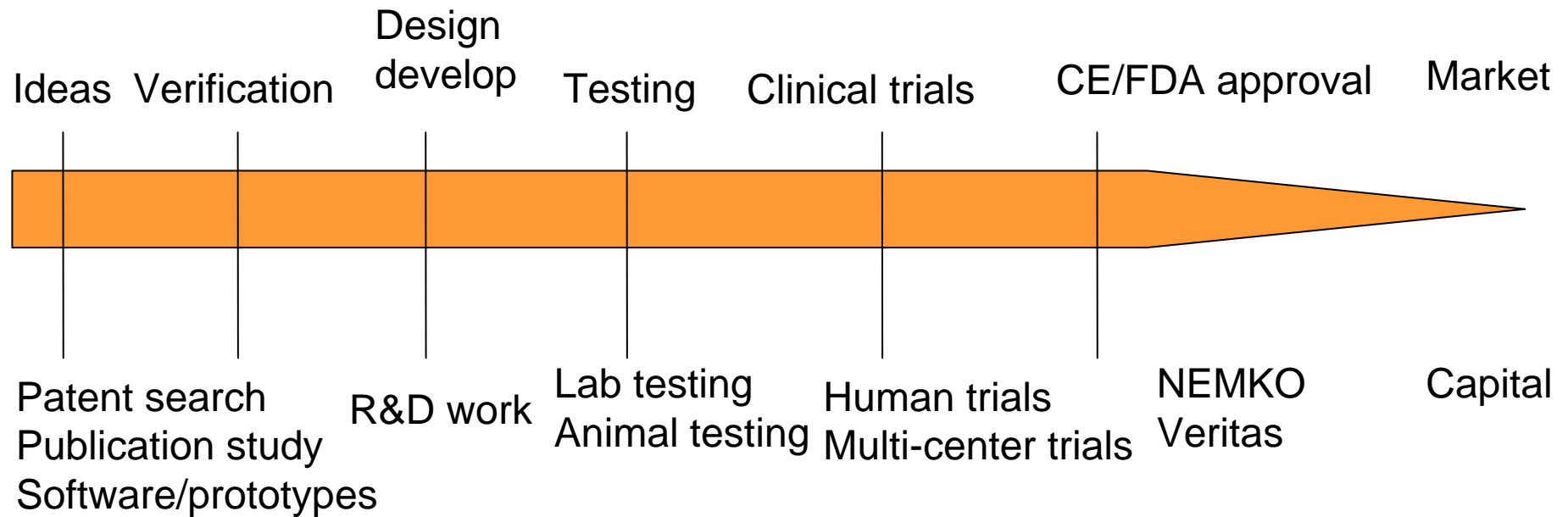
Example infrastructure



IVS Testbed		
Configuration Architecture		
Symbol	Count	Description
	2	PC
	1	PDA
	2	Ethernet
	1	Hub
	1	Server
	3	Basestation
	1	Firewall
	1	Virtual Network Sever
	2	WAN
	1	Motes



Some of the activities at the testbed



Future plans

- Negotiate with Innovation Norway of initial funding for manager and some infrastructure
- Establish a working group to get the testbed “up-and-running”
- Establish a website for testbed
- Advertise testbed through forums such as Wireless Health and Care project, Wireless Future, MedCoast Scandinavia, Oslo Teknopol, EU’s e-Mobility platform, etc.
- Investigate grants from EU’s living lab concept

