Department of child neurology, psychiatry & rehabilitation

LOMBARDIA
- **Milano, IRSSC Santa Maria nascente**
- Milano Vismara
- Legnano - Inverigo
- Pessano - Salice
- Varese

MARCHE:
- Falconara

LAZIO:
- Roma

CAMPANIA:
- Salerno

BASILICATA:
- Tricarico

IRCCS Santa Maria Nascente
Unit of child neurology, psychiatry & rehabilitation

0 to 18
DIAGNOSIS AND INTERVENTION

0 to 18
LONG TERM REHABILITATION PLANS

6 to 18
SCHOOL AND DAY CARE
(Multihandicap)

Teaching
Training
For
professionals

Assistive technologies

Research

Projects::
CARELab
Enablin+

Education and Culture DG
Lifelong Learning Programme

enablin+
Enabling & Including Young People with Complex & Intense Support Needs

Fondazione Don Carlo Gnocchi Onlus

IRCCS Santa Maria Nascente
Unit of child neurology, psychiatry & rehabilitation

0 to 18 (Ambulatory)
DIAGNOSIS AND INTERVENTION:
700 children/year

0 to 18 (Ambulatory)
LONG TERM REHABILITATION PLANS
500 children/year

6 to 18
SCHOOL AND DAY CARE
(Multihandicap**):**
65 children

The Team:
MD in child Neuropsychiatry and rehabiitation, psychologists & neuropsychologists, developmental therapists, speech therapists, professionals educators,social worker, music therapist, bioengeneers

Teaching
Training
For
professionals

Computer
Assisited
rehabilitation
laboratory
(CARELab)

Research:
Technologies
Authism, Rett
syndrome

Projects:
CARELab
Enablin +

Education and Culture DG
Lifelong Learning Programme

enablin+
Enabling & Including Young People with Complex & Intense Support Needs

Fondazione Don Carlo Gnocchi Onlus

IRCCS Santa Maria Nascente
Unit of child neurology, psychiatry & rehabilitation

0 to 18 (Ambulatory)
DIAGNOSIS AND INTERVENTION:
Short term rehabilitation plans

0 to 18 (Ambulatory)
LONG TERM REHABILITATION PLANS

6 to 18
SCHOOL AND DAY CARE
(Multihandicap**):**
65 children

0 → 18

CONTINUITY OF CARE
Family cenered approach

Teaching Training For professionals

Computer Assisited rehabilitation laboratory (CARELab)

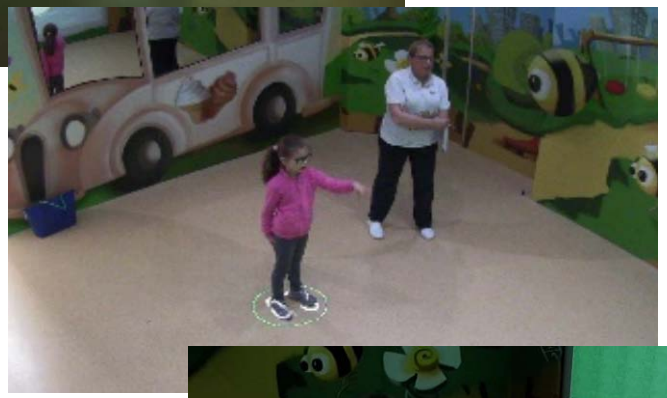
Research: Technologies Authism, Rett syndrome

Projects: CARELab Enablin +

Education and Culture DG
Lifelong Learning Programme

enablin+
Enabling & Including Young People with Complex & Intense Support Needs

CARE (Computer Assisted REhabilitation) Lab



CARE (Computer **A**ssisted **RE**habilitation**) Lab**

- Advanced technologies have strong potentialities in pediatric rehabilitation and can be specifically studied and tested to improve neurlogical functions
- A space to study and validate protocols of intervention, to measure outcomes and to develop models for home rehabilitation
- Developing integrated solutions to promote child involvement and improve his participation along the session
- With at the same time the development of a platform:VITAMIN (VIrtual realiTy plAtform for Motor and cognItive rehabilitation) to create activities for motor and cognitive rehabilitation

Fondazione Don Carlo Gnocchi Onlus

CARELab

(Computer Assisted Rehabilitation Laboratory)

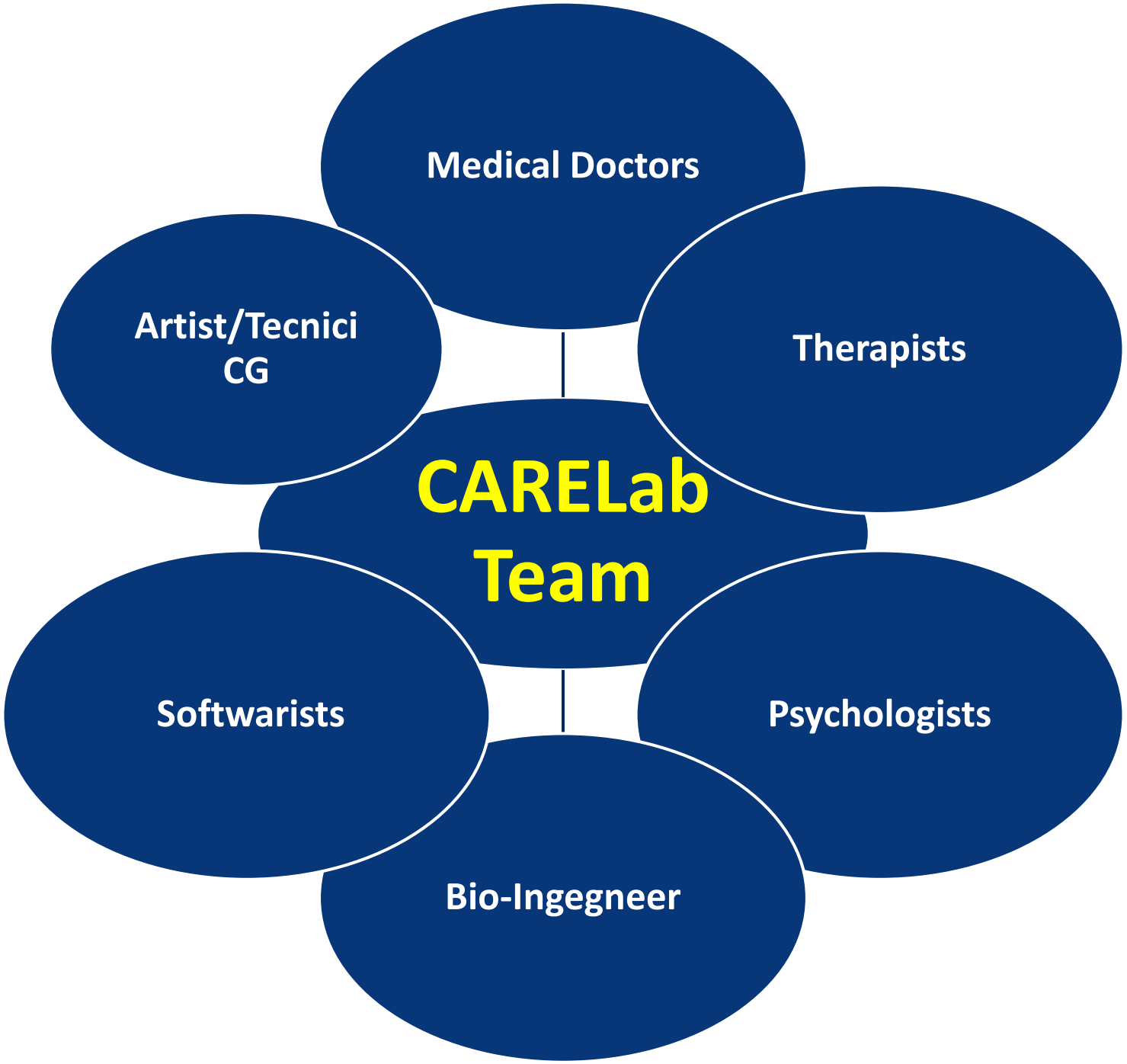
U.O. Neuropsichiatria e Riabilitazione dell'Età Evolutiva

Centro di Innovazione e Trasferimento Tecnologico (CITT)

IRCCS S. Maria Nascente, Milano

Responsabili del progetto:
Dott.ssa Lucia Angelini
Dott.sa Ivana Olivieri

Dr. Furio Gramatica
Ing. Paolo Meriggi


Medical Doctors
Artist/Tecnici CG
Therapists
CARELab Team
Softwarists
Psychologists
Bio-Ingegneer

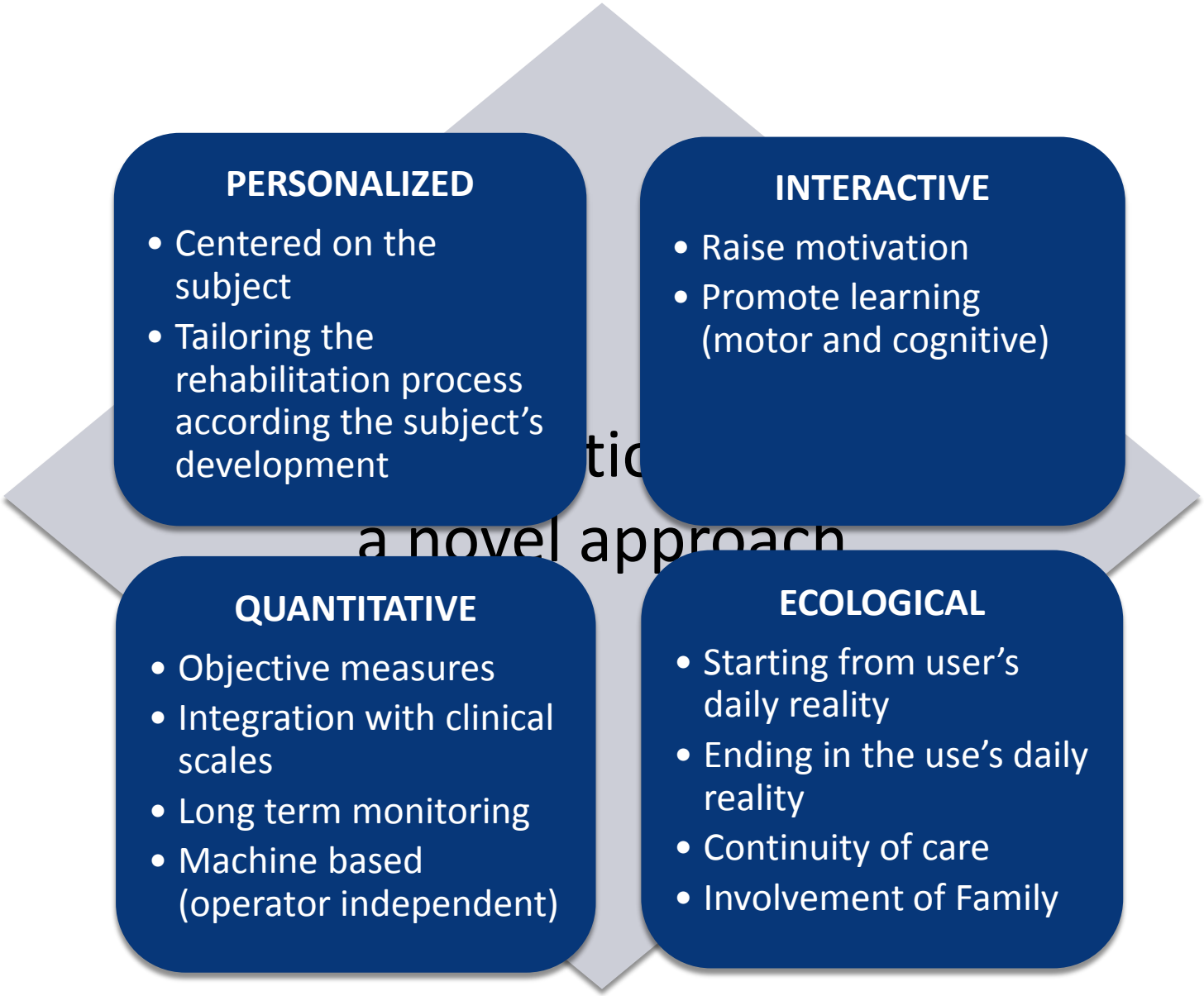
CARELab Research Projects

VITAMIN:

VIrtual reali**T**y pl**A**tform for **M**otor and cognitive rehabilitation

MARINER:

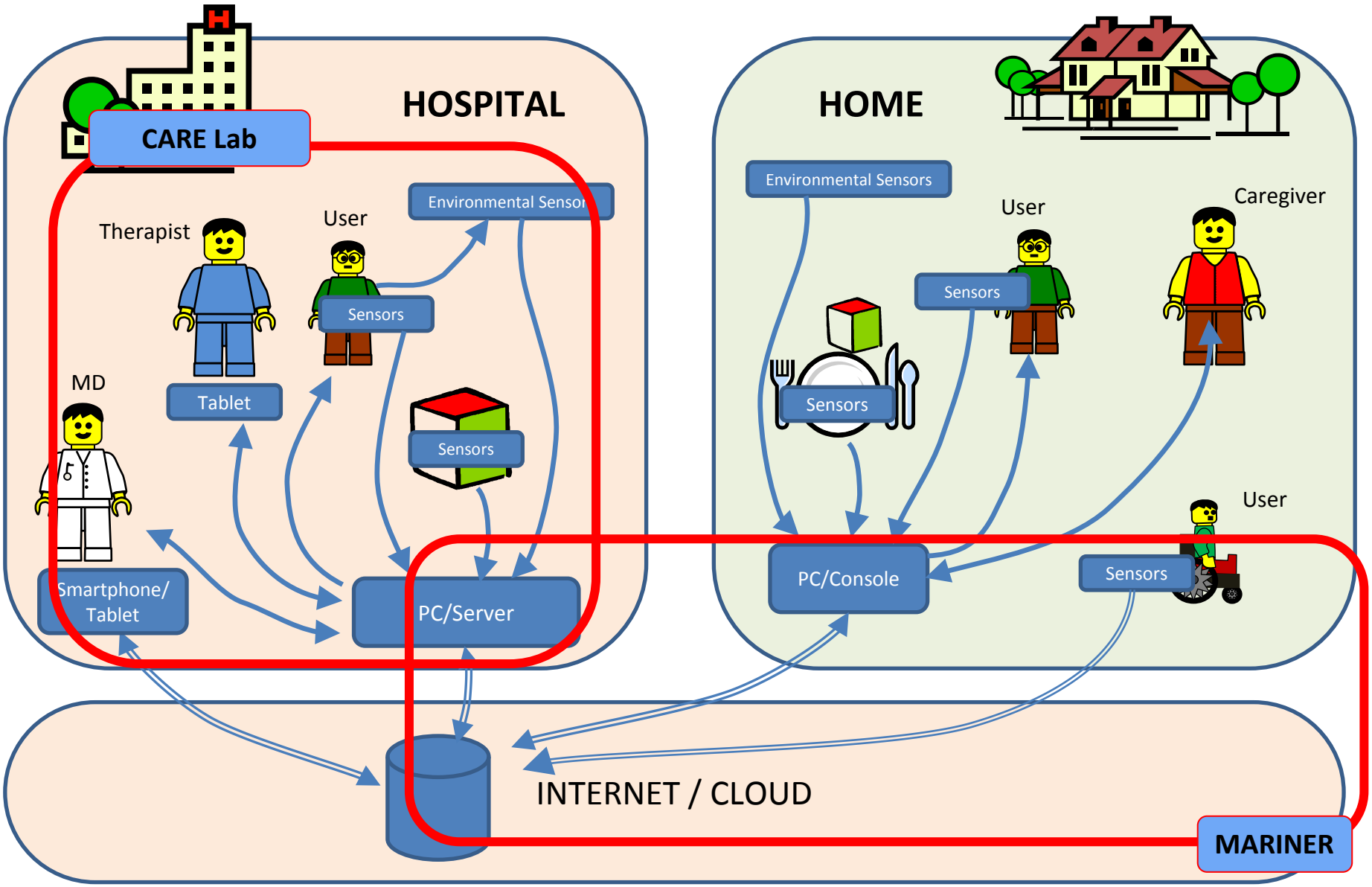
Monitor**A**ggio **R**emoto di carrozz**INe** **E**lett**R**oniche


PERSONALIZED
• Centered on the subject
• Tailoring the rehabilitation process according the subject's development
INTERACTIVE
• Raise motivation
• Promote learning (motor and cognitive)
tic
a novel approach
QUANTITATIVE
• Objective measures
• Integration with clinical scales
• Long term monitoring
• Machine based (operator independent)
ECOLOGICAL
• Starting from user's daily reality
• Ending in the use's daily reality
• Continuity of care
• Involvement of Family

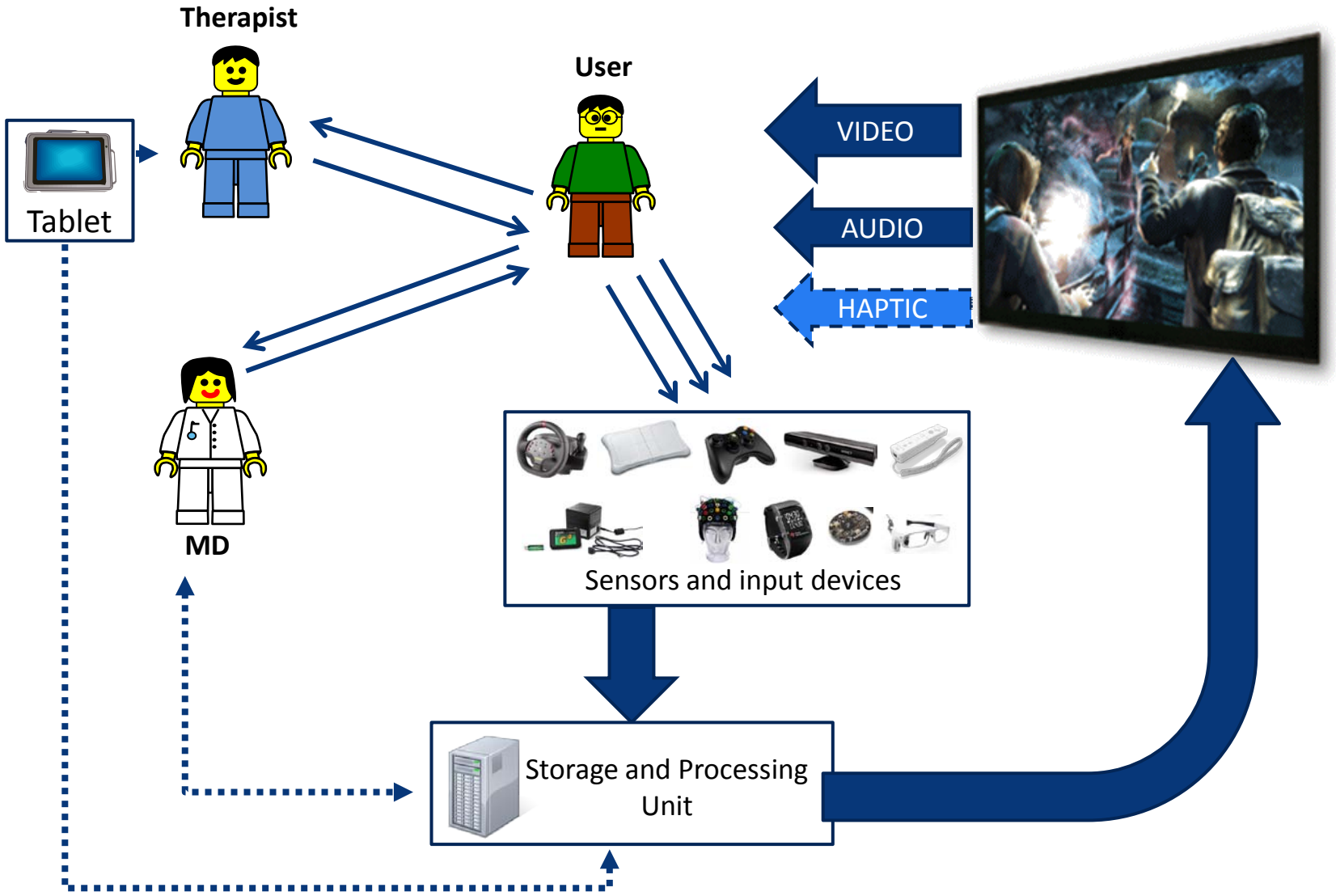
CARE Lab – Clinical Applications

- Current Applications
  - Upper limbs motor rehabilitation (we have completed a first pilot study on hemiplegic children)
- Short Term Applications (from Q1 2017)
  - Rehabilitation Activities including cognitive exercises, with a particular focus on the executive functions
    - Visual attention
    - Inhibition
    - Shifting
    - Short term memory
    - Working memory
- Future Applications (after Q2 2017)
  - Upper limbs rehabilitation including fine movements
  - Lower limbs and full body rehabilitation
  - Rehabilitation protocols targeted on development problems related to the movement coordination
  - Home Rehabilitation

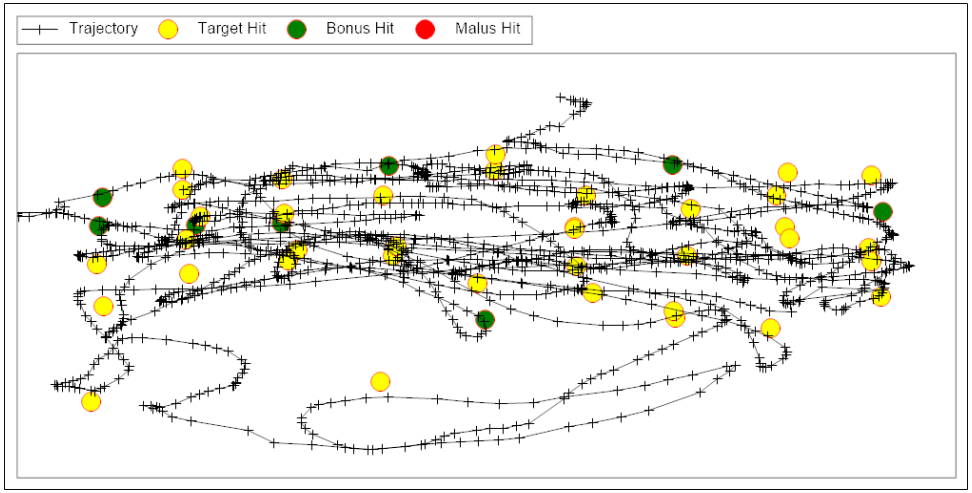
Innovative Pediatric Rehabilitation – General Overview



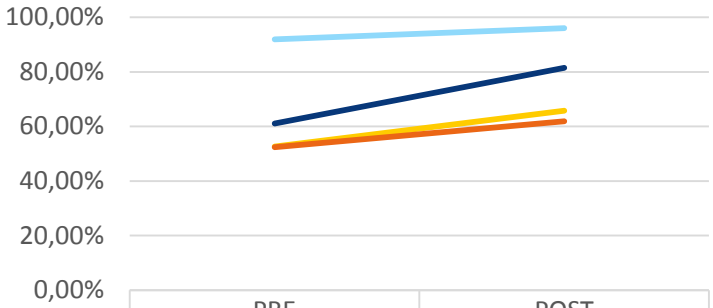
From Videogame to VITAMIN:
VIrtual realiTy plAtform for Motor and cognItive rehabilitatioN



CARE Lab: Preliminary Results of the Pilot (6 subjects over 10 sessions)

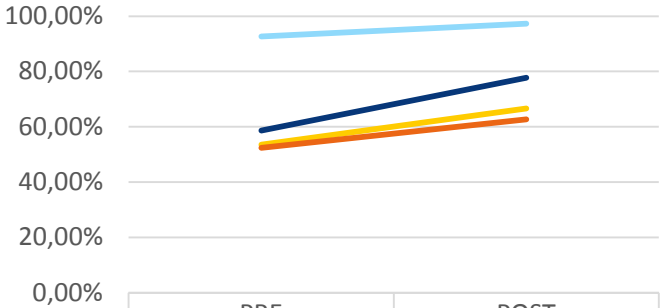


Melbourne 2 Median Score



	PRE	POST
Range of Movement	61,11%	81,48%
Accuracy	92,00%	96,00%
Dexterity	52,63%	65,79%
Fluency	52,38%	61,90%

Melbourne 2 Mean Score



	PRE	POST
Range of Movement	58,64%	77,78%
Accuracy	92,67%	97,33%
Dexterity	53,51%	66,67%
Fluency	52,38%	62,70%

Project MARINER: MonitorAggio Remoto carrozIne ElettRoniche

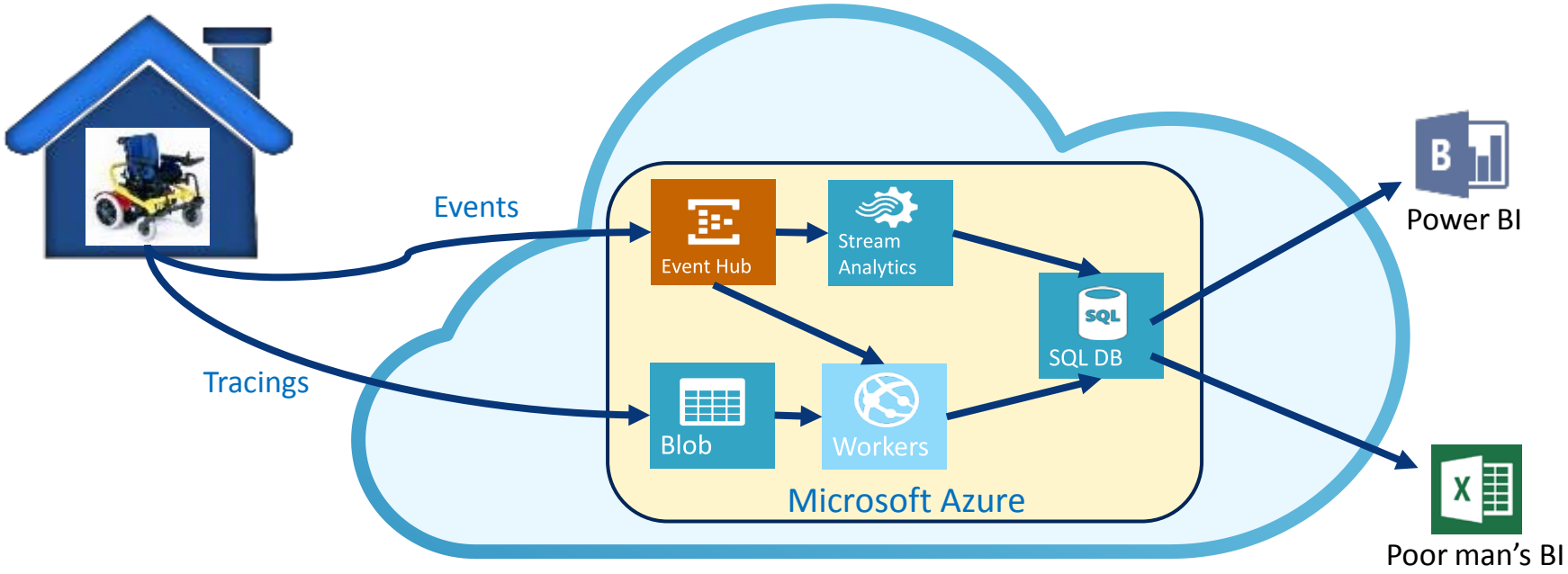
- Main project goal: to verify that the early adoption of Powered Wheelchair (PW) may contribute to an increase in cognitive functions, through the autonomous exploration of environment

- Secondary project goal: to build and test an appropriate hw/sw architecture to acquire quantitative data about the daily use of PW, storing them locally and in the cloud, where they may be further processed to extract indexes.

- The project (funded by Lombardy Region) started in 2013 and is currently in the final test on-the-field phase.

Project MARINER: Details of the PW Setting

Project MARINER: Back-end Details



The developed architecture may be used for remote monitoring other types of signals acquired or transferred by smartphones, smartwatches, smart object, etc.