

REACH 2020:

Responsive Engagement of the Elderly promoting Activity and Customized Healthcare

Project Overview and Outlook

Prof. H. B. Andersen, Dr.-Ing. T. Linner

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promoting Activity and Customized Healthcare**
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Who we are

Dr. Thomas Linner, senior scientist and lecturer in building realization and robotics at Technical University of Munich

Coordination manager of REACH

Expertise: specialist in systems; has supervised, managed, and contributed to several major multi-partner research projects, with a focus on the development and deployment of advanced technology in the construction, smart buildings, manufacturing/workplace and health care/assistive technology sectors.

Prof. Henning Boje Andersen (prof. emeritus, senior scientist)

Leader of the Danish partner group of REACH

Expertise: Human factors, human-system interaction in safety critical domains, healthcare technology implementation and assessment.

Involved in patient safety and healthcare quality research, including legislative background for law on non-punitive reporting of “medical errors”. Ethics guidelines on privacy and ambient & wearable monitoring, ...

REACH

RESPONSIVE ENGAGEMENT OF THE ELDERLY PROMOTING ACTIVITY AND CUSTOMIZED HEALTHCARE

REACH: an ecosystem approach



Technische Universität München

Technical
University of
Denmark



Technische Universiteit
Eindhoven
University of Technology



ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

UNIVERSITY OF
COPENHAGEN



Fraunhofer
IAIS

ARJOHUNTLEIGH
GETINGE GROUP



food innovations gmbh
biozoon.



SmartCardia

sturm.



Hôpitaux
Universitaires
Genève



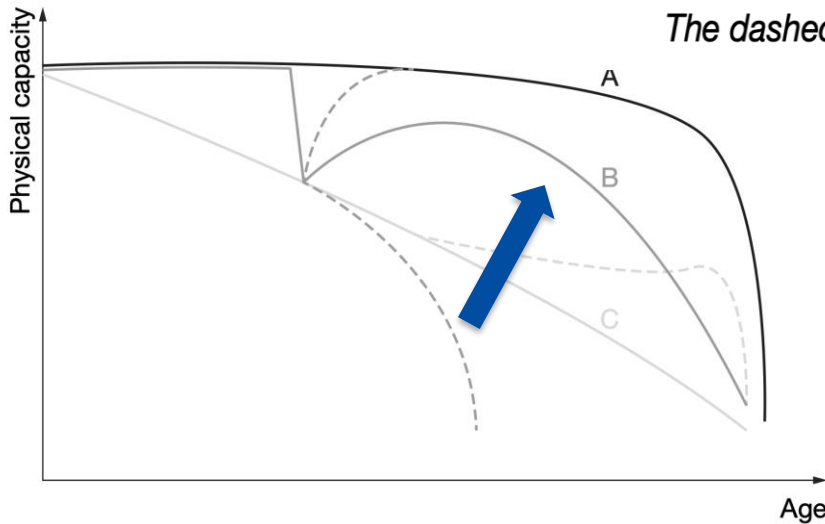
**SCHÖN
KLINIK**
Bad Aibling



LYNGBY-TAARBÆK KOMMUNE

New care environments for elderly counteracting rising health expenditures

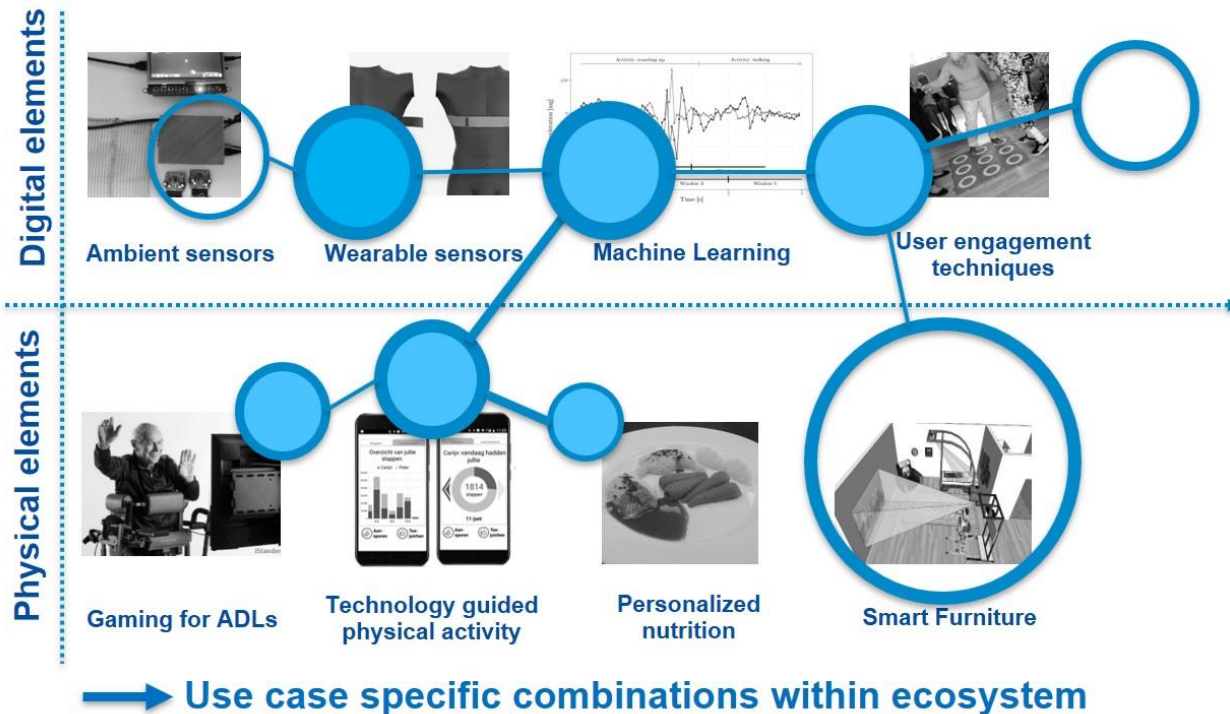
- A. Optimal trajectory, intrinsic capacity remains high until the end of life.
 - B. Interrupted trajectory, an event causes a decrease in capacity with some recovery.
 - C. Declining trajectory, capacity declines steadily until death.
- The dashed lines represent alternative trajectories*



REACH

Based on WHO "World Report on Ageing and Health"

REACH Tool Kit: Techniques, Processes, Technologies + Combination Rules



Touchpoints

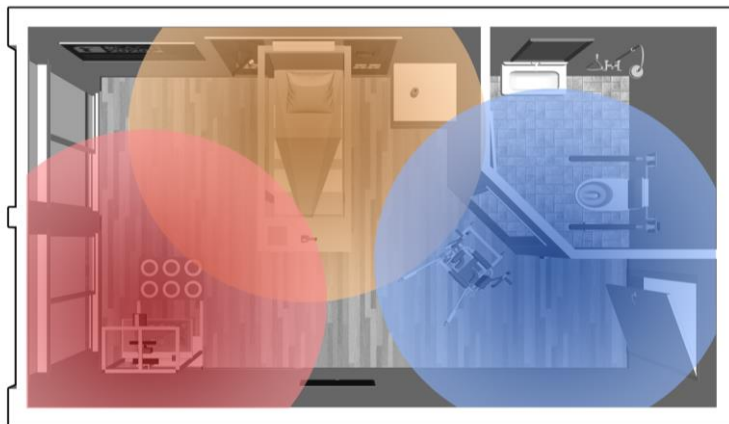


Day care center (ZuidZorg)

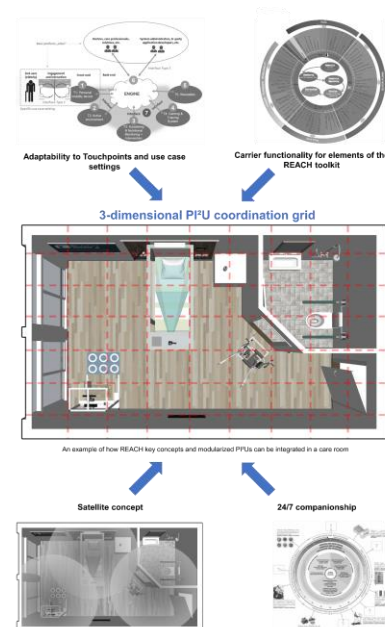


Sensor monitoring for surveillance and motivation (Lyngby)

Personalised Intelligent Interior Units (PI²Us)



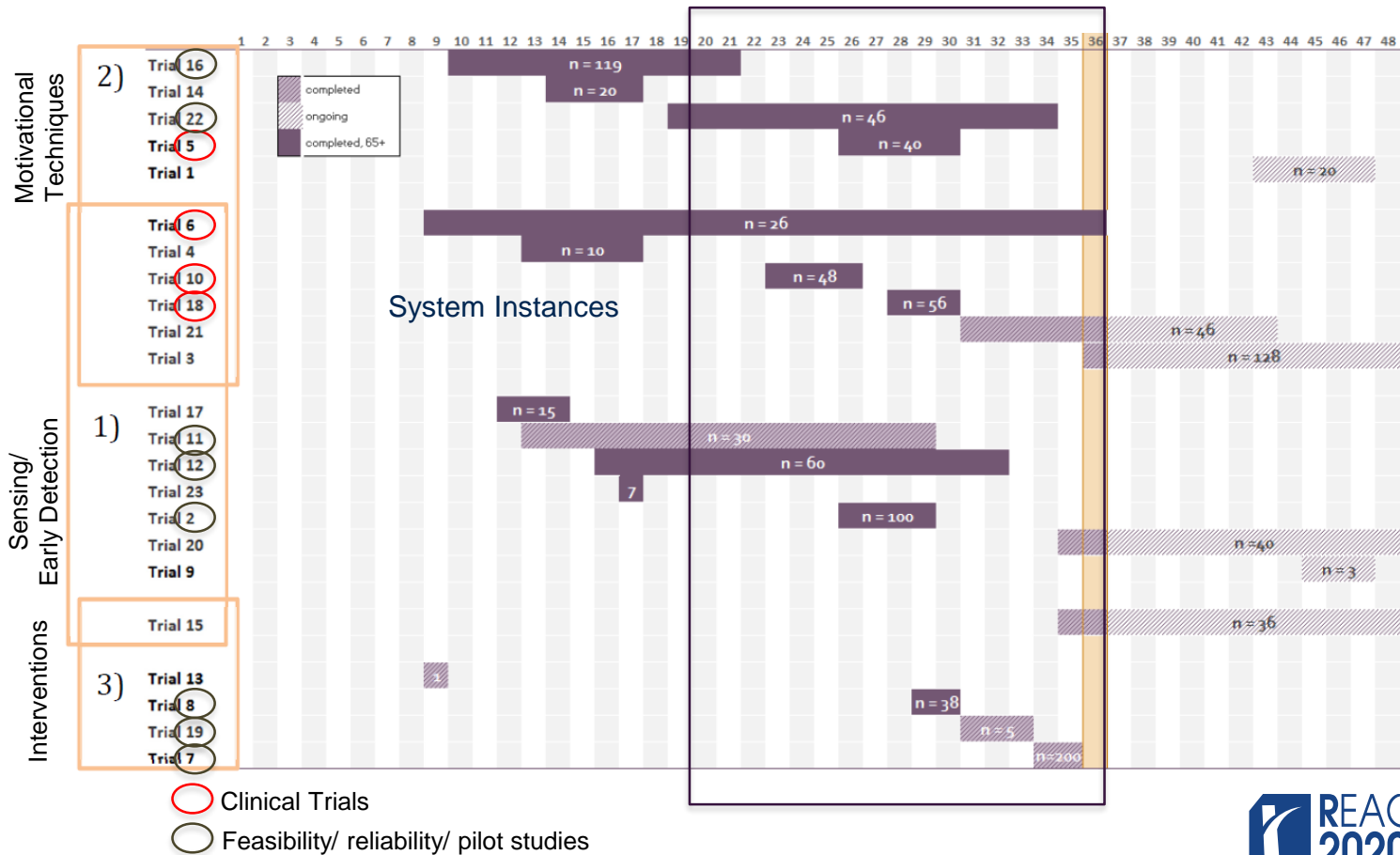
PI²Us are comprised of five interacting conceptual key features



Associated Deliverables (Ds): The detailing of the overall concepts for individual PI²Us and their design is described in **D22** (PI²Us: planning); Mock-ups for demonstrations and testing (e.g. in the context of the Human Activity Recognition chain): **D24**; aspects related to the use of PI²Us as carrier elements for ambient sensors: **D8**; PI²U control software: **D20** (Software across TPs to embody motivational aspects); integration of playfulness and other motivational strategies in the design of PI²Us in **D17** (multifunctional mobilisation/ rehabilitation system) and **D19** (playful intervention regimes).

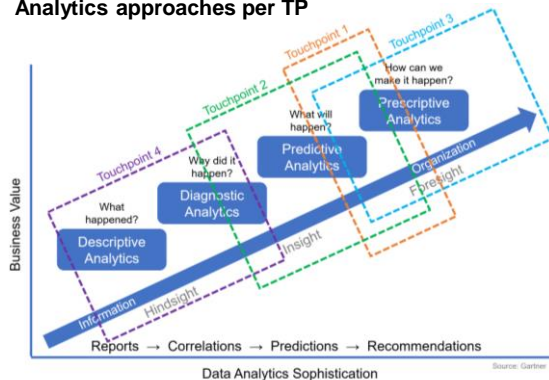
RESULTS AND OUTLOOK

Strategy with regard to trials

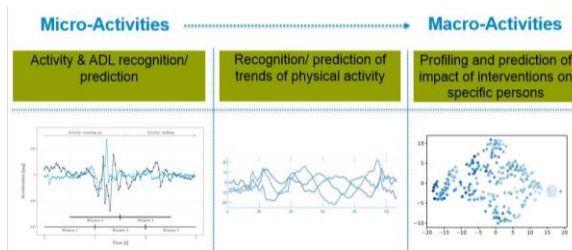


Sensing, data analytics, and machine learning in REACH

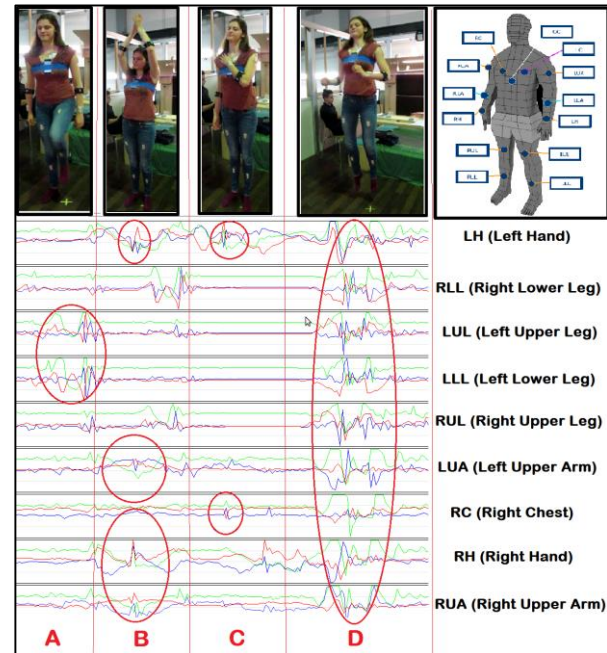
Analytics approaches per TP



Analytics types used (→ Categories of Early Detection)



Integration of sensing body area network with HAR chain

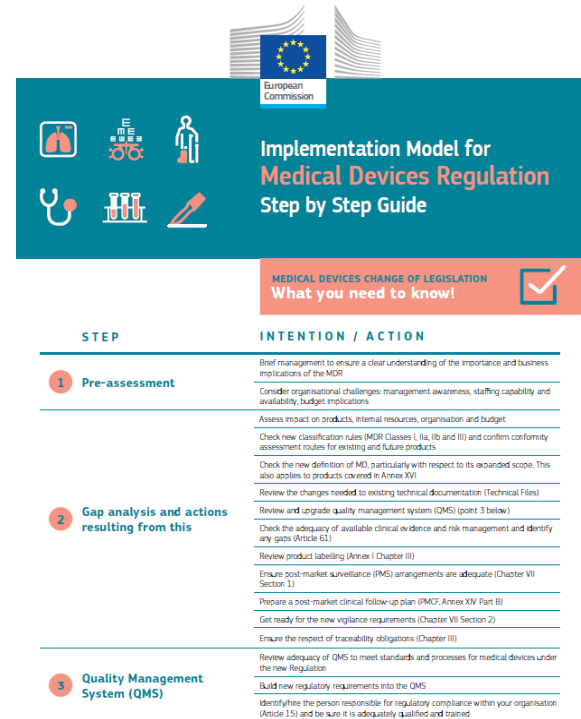


Associated Deliverables (Ds): The theoretical foundations were laid in **WP3/D09** (ML requirements) and then developed in detail and implemented for TPs 2 and 3, including the transfer learning techniques in **WP3/D11** (Data analytics and ML across TPs); **WP4/D19**: experimentation with Playware tiles to supplement/replace traditional standardised performance tests; **WP2/D6**: Stationary and ambulant sensing schematics; **WP2/D8**: Data convergence and processing system.

Initial steps towards medical certification

The REACH consortium is linking up with consortium-internal and consortium external experts in medical certification, and is at present pursuing the following steps towards a medical certification plan:

1. Clear definition of the medical purposes and medical claims for each Touchpoint
2. Revision and refinement of a) medical claims plus b) the with these claims associated necessary verification/validation procedures towards medical certification.
3. Risk analysis (key to plan the clinical evaluation and certification roadmap) – Identification and evaluation of risks for end-users and caregivers associated with the REACH solutions in question.
4. Identification and analysis of standards (ISO, IEC, etc.) that need to be met in the context of each claim/sub-system.
5. Final positioning – alignment of medical claim and assignment of the REACH solution to a specific medical device class.



https://ec.europa.eu/growth/sectors/medical-devices/getting-ready-new-regulations/manufacturers-md_en

Standardization – an example: Balancing privacy and need for care

A CEN Workshop Agreement

“Guideline for introducing ambient and wearable monitoring technologies balancing privacy protection against the need for oversight and care”

- Risk Governance
- Risk Assessment
- Risk Controls
- Risk Agreement / Informed Consent

https://ec.europa.eu/growth/sectors/medical-devices/getting-ready-new-regulations/manufacturers-md_en



Would we do it again?

OF COURSE!



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