ECHORD++

The European Coordination Hub for Open Robotics Development

5th Review Meeting – Work Package 5
PDTI – Public end-user Driven Technological Innovation

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Highlights – *major achievements during the reporting period*

Major challenges during Phase III: Technology development and defining the route to market resp. commercialization.

Sewer inspection:

- SIAR: fully functional prototype at TRL 7, potential full-fledged service provider for owners of sewer networks
- ARSI: very advanced software solution, can be commercialized as stand-alone product, team up with service provider, way to finance full-fledged solution

Healthchare:

- ASSESSTRONIC: prototype at TRL 6, modular, scalable solution, 2 years of tech-development for ACETIAM to prioritize for commercialization
- CLARC: longer route to market, scientific findings, data representation and management interface

Lessons learned

- challenge should allow for technology restriction
- all stakeholders on the screen
- user and purchaser of the technology are not necessarily the same entity and the interests of these two can be very different from each other.
- clarify the role and decision-taking power of each stakeholder
- proper mock-up in the labs
- coaching by the tandems business-technical important
- additional in-person review meeting between the development teams and the external experts beneficial
- intensive coaching, intensive collaboration with end-users and coordination during the process by a multidisciplinary team are key
- assess the qualification of the end-user

PDTI Healthcare Geriatric Comprehensive Assessment

Main Achievements

- Promising application area for automation: societal and socio-economic impact
- Defined **technical focus areas for automation**
  - Medical improvement has been verified by healthcare professionals
- Up-to-date challenge: Human-Robot Interaction
  - Older adults: **100 older adults tests in PDTI healthcare**
- Change of mindset: entrepreneurship
  - User-centred product development
  - Solution with market potential
  - Credible business plan with promising business case
  - 30 potential strategic partners identified
- Both teams have received/identified appropriate follow-up funding

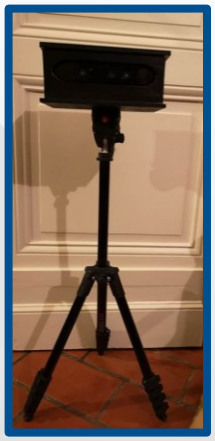
PDTI Healthcare

Main achievements: Prototype progress Phase I-III

ASSESSTRONIC

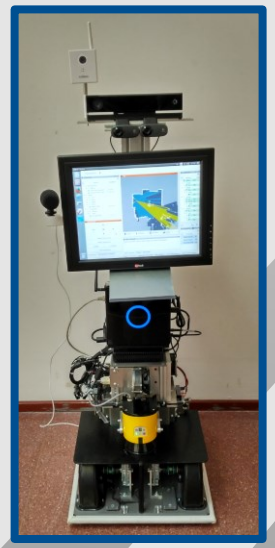






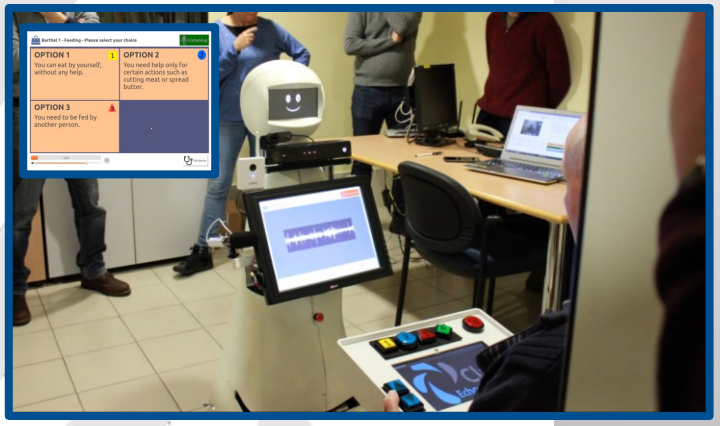

Phase I → Phase III

CLARC





Recommendations from Phase II

	ASSESSTRONIC	CLARC
Technical	• TRL 5 • TRL 6-7: increase robustness and open for additional functionalities • more extensive testing to iron out functional deficits	• TRL 4 • TRL 6-7: Complexity reduction • Consultations with clinicians, health practitioners and wider range of users.
		
Business	• realistic business plan must be made around a combined software and hardware offer	• realistic business plans, taking into account realistic forecasts

PDTI Healthcare Geriatric Comprehensive Assessment

Expected Outcome

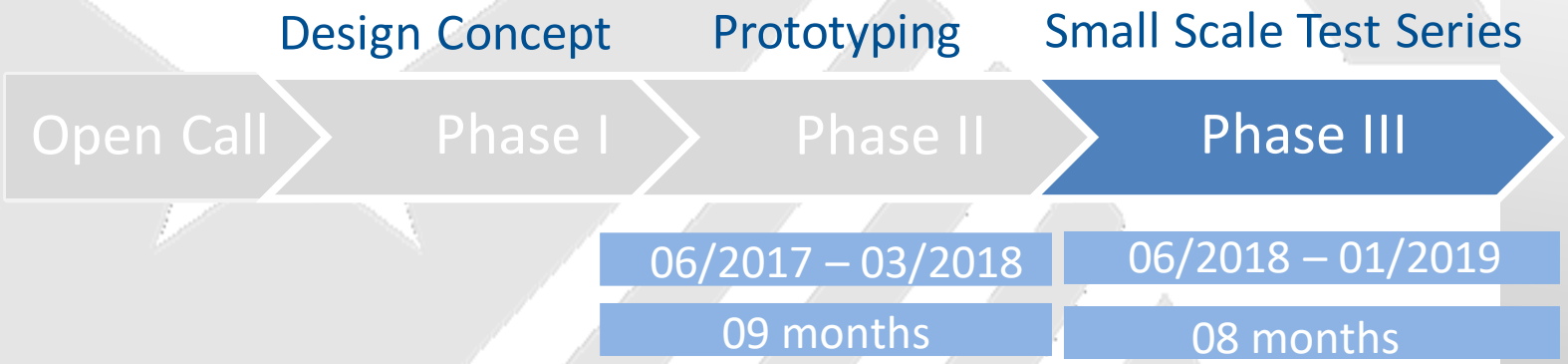
Reduced scope of the technology

- Get up and Go Test, Barthel test
- Bring the technology to a higher TRL 6-7
- Appropriateness of new scope was confirmed by public body and reviewers

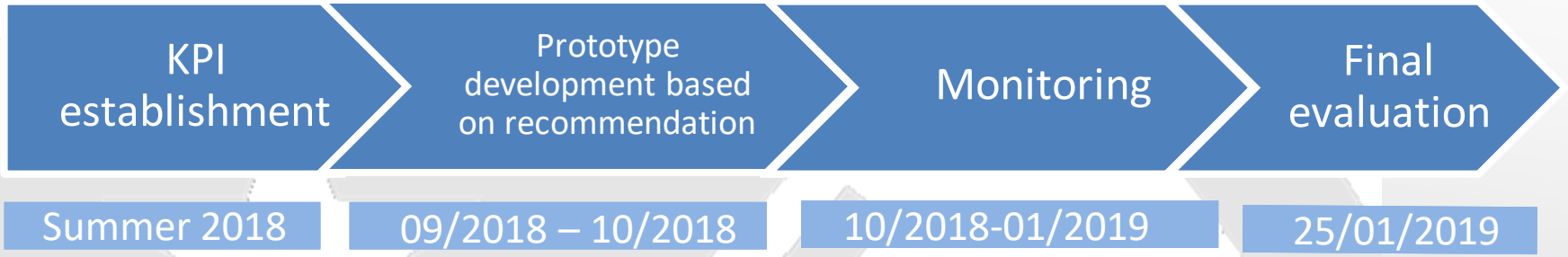
Phase III

- Fully functional system ready to be tested in practice with very limited help of the developers
- Commercialization preparation

Phase III context and timing of activities



Phase II context and timing of activities



- **KPIs** were set together with RTD consortia and in alignment with public body and reviewers
  - KPIs focused on **commercialization**
- Phase III started with development based on **Phase II recommendations**
- **Mid-term evaluation:** test with patients and demo to healthcare professionals
- **Monitoring** weekly contact with technical and business monitoring team
- **Final evaluation**
  - Demonstration of new prototypes
  - Outline of achievements according to KPIs

Active Interaction in Phase III

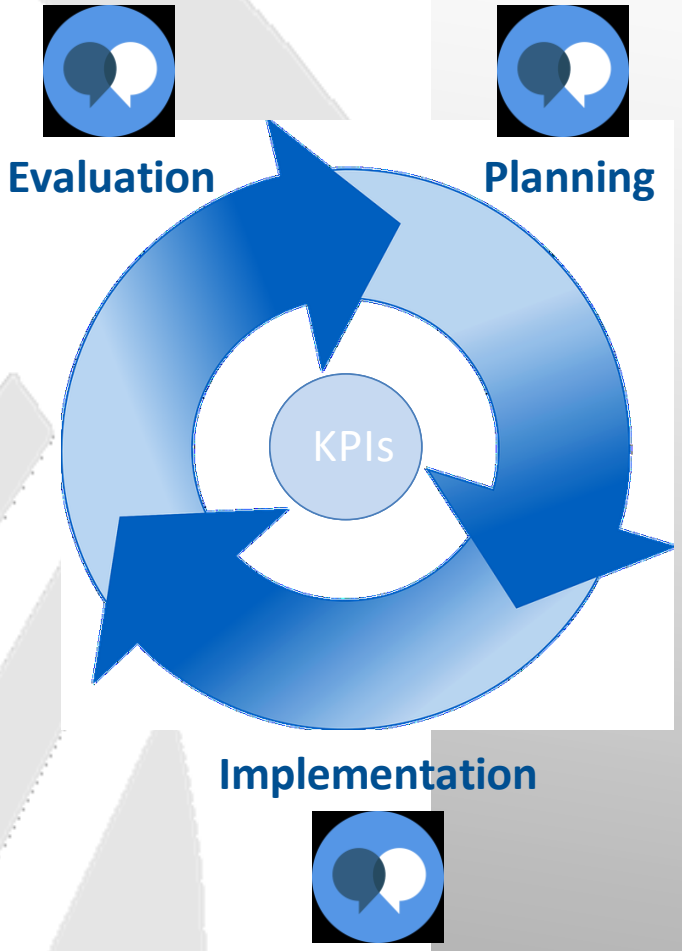
Phase I: no active interaction (deliberate decision)

- Evaluate pro-activeness of RTD consortia

Phase II: open dialogue between **all stakeholders** (monitoring team + RTD consortia)

Phase III:

- Open dialogue, but **structured** due to limited time
  - Clear goals, (sub) deliverables and deadlines
- Weekly calls (technical and business)
  - Continuous evaluation and improvement
- Feedback by all stakeholders
  - During mid-term testing
  - Visit of public body during small scale tests



Evaluation Criteria

Categories

Technical KPIs

- Production and deployment
- Ease of use in daily routine
- Human-Machine Interaction
- Design
- Compliance
- Data analysis

Focus: product development

Impact KPIs

- Business plan
- Business plan presentation
- Market Intelligence
- Data room

Focus: business documentation

Review of public body and reviewers:

- Additional metrics were included to measure ethical compliance and data reliability
- Reflecting end-user's needs

Progress of RTD Consortia: CLARC

Small Scale Test Series:

- Older adults, not all showing geriatric deficiencies: good opportunity to collect feedback on prototype
  - Investigate other application areas
  - Test how to deliver, install and maintain robot
  - Test performance without developer
- Technical issues with new prototypes delayed studies
  - 45 patients tested in Phase III
  - More tests conducted after end of Phase III

Progress of RTD Consortia: CLARC

Prototype development

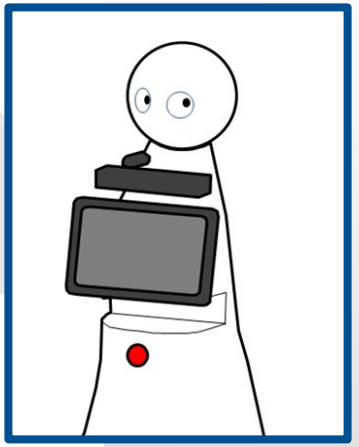
- Software changes to increase robustness
- New remote control design
- Re-design of robot structure
  - Microphone and camera inside structure
  - Re-design of face

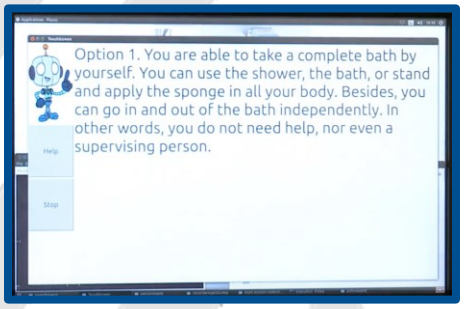
Commercialization & dissemination:

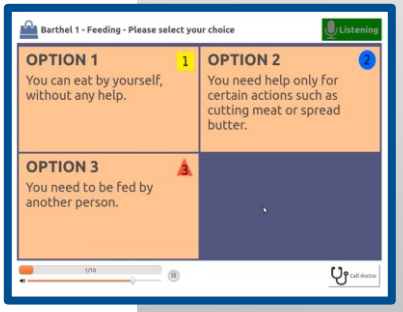
- Detailed business plan & market intelligence report
- Participation in Automatica 2018, IROS 2018, MEDICA 2018

Phase I-II

Phase III







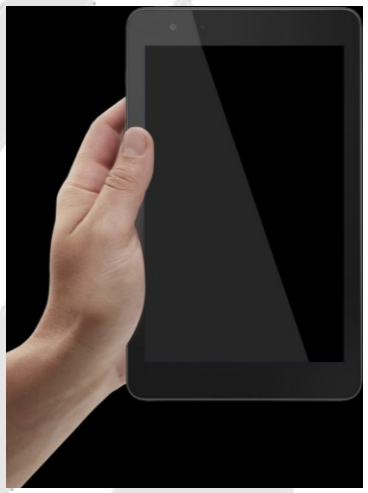
Progress of RTD Consortia: ASSESSTRONIC

Small Scale Test Series
- Tests performed with 20 patients and relatives
  - Appropriate sample
- *More tests needed for clinical certification*

Prototype development
- Re-design of interface
- New prototype of sensor box

Commercialization & dissemination:
- Detailed business plan & market intelligence report
  - *Scalable solution close to market*
  - *Good market potential*
- Participation in MEDICA 2018

Phase II



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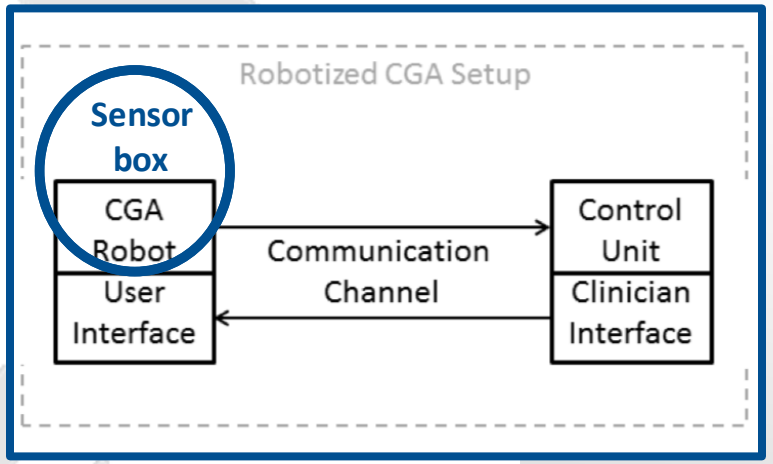
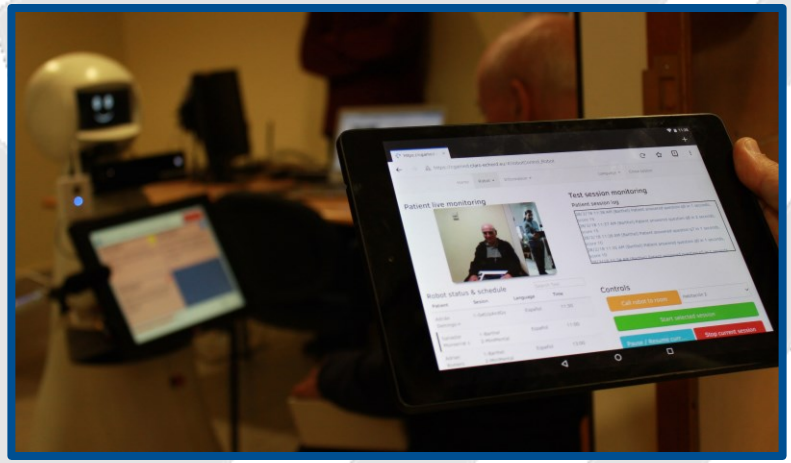
Phase III

Conclusion PDTI Healthcare Phase III

ASSESSTRONIC has a modular, scalable solution with good cost-benefit ratio

- With ACETIAM involved, product can reach market within 2 years
- Business plan is credible
  - 22€ savings per CGA, 2 months payback
  - Improvement: development team, certification costs and sales numbers





CLARC has innovative solution

- User research: ensure long-term acceptability and sustainability
- Business plan (service model) is credible
  - 262€ savings per day; 1 month payback
- Interface for healthcare professional: data representation and management promising