A *systemic perspective* on technology-augmented LTC services

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Technology-augmented services for Long Term Care (LTC)

Current large demographic and economic transformations ask for more effectiveness and sustainability in the LTC systems, preserving quality and improving appropriateness.

The **technology-augmented services** could be a key element in the increasingly demanding LTC scenarios, **if properly selected and adapted** to their peculiar requirements

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the direct impact

- *LTC-related technology should support daily life activities and enrich resident quality of life, addressing*
  - *safety (e.g., falls, wandering),*
  - *self-care activities (e.g., bathing, taking medication, eating, mobility, sleeping),*
  - *communication (e.g., social interaction and connection),*
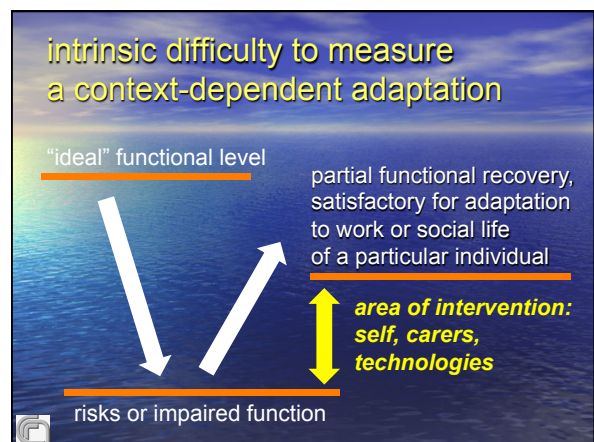 - *entertainment (e.g., recreation, leisure).*

[Tak 2010]

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the mechanisms

- adaptation / reduction of the effects of the existing impairments
- prevent, delay or reduce the impairments as effects of diseases / complications
- prevent risks of accidents; timely interventions afterwards (button)

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ISSUE	TOPIC	TOOL	ACTOR
pain	rest	medications, electric profiling bed, electric height-adjustable couch, pressure reduction mattresses	GP (to prescribe)
	nocturne		
	walking	aids and appliances as walking stick or walking aid	
ADL	elimination	bedside commode chair, bedpans, bedbaths	nurse, care giver (to make)
	dressing underdressing shoes	special shoes and clothes	
	personal hygiene and grooming	mobile bariatric shower, commode chair	
	functional transfers (bed↔chair)	sliding sheet, mobile sling lifter, bariatric slings, bariatrc wheelchair	
	ambulation	walking aid, walker with castors	
IADL	shopping for groceries, clothing, medications	e-commerce, care giver	care giver, social services
	mobility / transport	coordination services	
health mainte-nance	taking medications	eletronic diary, dispenser	specialist, self
	nutrition/diet	food journal, sensors in the fridge	
	self-monitoring	contacalorie	
	remote monitoring	weight, pression, blood glucose	
education	remote training	portals, community,	contact centre (counselling)
	supervision technology	portals, community	
preven-tion	follow-up nutrition	ICT application for communication and reminders	GP
	follow-up related pathologies	ICT application for communication and reminders	
	follow-up psychological state	ICT application for communication and reminders	
safety	home enviroment	alert systems, sensory	?
leisure	communication	telephone, pc, tv	self
physical activity	rehabilitation	tele-therapy, wii	therapist, self
	trainer	tele-therapy, wii	

(a sample …)

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intrinsic difficulty to measure a context-dependent adaptation

"ideal" functional level

partial functional recovery, satisfactory for adaptation to work or social life of a particular individual

area of intervention: self, carers, technologies

risks or impaired function

potentialities

- partially restored abilities
- more authonomy, less dependency
- more people able to remain at home
- less burden for care helpers
- less need for care helpers for the same people (but increasing number of people with needs)
- less workload for formal carers

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towards a **systemic** effect

- several isolated tools, equipments, ICT solutions *(e.g. directly acquired by the consumer or provided by the care providers)* **cannot change the context**
- **innovative organizational models are required to face sustainability and equity** *e.g. chronic disease management, virtual presence*
- according to new rules of the game (regulations, incentives)

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improve the **demand side**

We claim that the LTC sector should strongly *improve the demand side* (and thus to contribute to a more clear and stable market) *to achieve more informed decisions*, guided by the LTC problems, at different levels of responsibility: i.e. at *global, regional, local and individual* level

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at the **global** level:

identify the *challenging contexts* which are recognised as *bottle-necks along typical LTC processes*

- *to drive applied research and industry* towards new solutions and optimised technological services

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at the **regional** level:

balance attention and resources across suitable *existing technologies* to deploy specific *LTC action plans* in a *comparative, wide-ranging vision*

- work out the *relative relevance* of each technological service
- *maximise the impact* of *highly pervasive solutions*

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at the **local** level:

helping to select the **care services** that could be augmented by technological solutions,

suitable for the local context,

for each phase in the evolution of each specific health issue

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at the **individual** level

assisting in the best match

between a personal health issue
and available services and devices,

purchased by the families
or offered by providers
and voluntary organisations

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WP4 in the ANCIEN Project

we developed an approach
to facilitate
a *systematic consensus building
among a group of stakeholders*
on the potential roles
of technological services

in the different phases
of the health conditions related to LTC

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three case studies

we focussed on different phases
of three case studies, respectively:

dementia, obesity and diabetes

to develop criteria
for a comparative assessment
of care needs
and related technological solutions

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approach in the case studies

identify the possible stages for each case study
    1. prevention / onset,
    2. stable phase,
    3. complex consequences
consider the impact on:
  – *the autonomy of the recipient,*
  – *the need of professional activities,*
  – *the distribution between residential
    and home care,*
  – *the burden of care helpers*

a) The **LTC needs** susceptible of technological assistance

We worked out descriptive criteria on 3 topics:

1. *The foreseeable evolution of demographic
   aspects, lifestyles and healthcare;*

2. *The limitations on ADL-IADL
   that may require LTC;*

3. *The required activities
   by formal and informal carers.*

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b) A meaningful use of the **technological solutions**

We worked out descriptive criteria
on technology, focussing on 7 topics:

1. *The opportunities increased
   by the technologies;*

2. *The ways of potential impact of domotics,
   equipments and home devices;*

3. *The potential impact of domotics
   and remote devices on ADLs;*

(continues)

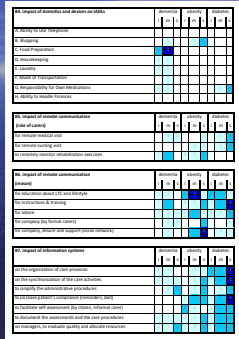## b) A meaningful use of the technological solutions

4. *The potential impact of domotics, equipments and (remote) devices on IADLs;*

5. *The potential impact of devices allowing remote communication: role of formal carers;*

6. *The potential impact of devices allowing either the citizen or the informal carer to remotely communicate: reason for contact;*

7. *The potential impact of information systems.*

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Relevance maps

- **3 stages**
- **of 3 conditions**

- **51 criteria in total,**
- **about 3+7 topics**

to facilitate
systematic discussions
among stakeholders

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	dementia			obesity			diabetes		
	i	m	s	i	m	s	i	m	s
technologies increases opportunity									
to delay progress of condition									
to reduce hospitalizations									
to stay in facility with nursing care									
to stay at home with informal carers									
to stay at home alone									
impact of domotics, equipments and (remote) devices									
for surveillance (sensors: position, movement)									
to avoid environmental risks (sensors: gas, fire, …)									
about ADL									
about IADL									
for vital sign measurements									
for clinical measurements									
impact of human communication devices									
for remote medical encounter									

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Technologies and organisational models

- technology-augmented care services second the deployment of planned organisational models;

- available technological solutions inspire innovative care services (supported by suitable regulations)

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conclusion

we claim that a comprehensive vision

on both LTC scenarios and technological opportunities

could bring to more informed decisions on the demand side (and on research)

and thus important benefits to both the LTC systems and the industrial market

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thanks

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