

Long-Term Care in The Netherlands

Vilans

The HAAL Project

Uniform Value-Based Research



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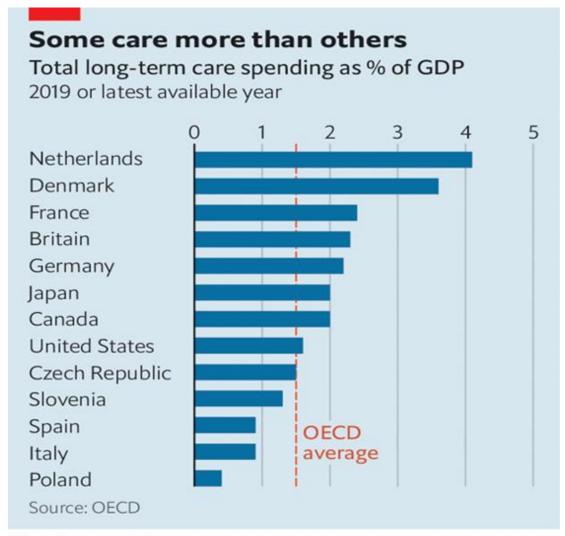


Welcome to the Netherlands!

DUTCH POPULATION	17.2 MILLION
Population 75+	1,4 million (8% of pop.)
Oldest Old Support Ratio (ratio 50-74 vs. 85 y/o)	15
Population 75+ living alone	660.000
Gross Domestic Product (GDP)	EUR 700 billion
Health expenditure	> 10% of GDP
Long-term care expenditure (health) by government and mandatory health insurance	4% of GDP
Total number of people employed in the healthcare field	1,2 million (13% of working population)



Long-term care spending



Can rich countries care for the old without going bust?

| The Economist

Denmark and the Netherlands hope technology and planning will bail them out



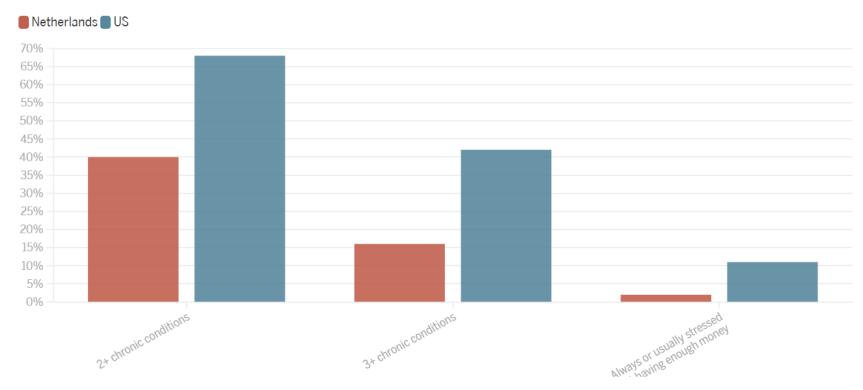


Happier, healthier & longer lives

https://www.bostonglobe.com/2022/08/18/world/netherlands-national-plan-makes-aging-long-term-care-priority/

Dutch older adults are healthier and less stressed about paying the bills

Sixty-eight percent of Americans over 65 reported two or more chronic health conditions versus 40 percent of their Dutch counterparts, while 2 percent of Dutch over 65 and 11 percent of Americans were stressed about having enough money for food, rent or bills.



Source: 2021 Commonwealth Fund International Health Policy Survey of Older Adults. • 630 respondents in the Netherlands and 1,609 in the United States were surveyed.

Christina Prignano/Globe staff

Data suggest that big spending could pay dividends in:

- happier,
- healthier and
- longer lives



SOLIDARITY

We use the word solidariteit, or solidarity, to the Dutch commitment to older residents.

Rich & poor, young & old, healthy & ill...In the Netherlands, everybody has access to the same high-quality care.



Transitions in LTC

From....

- central
- public spending
- professional care
- specialist
- professional care
- supply driven
- quality of care
- health and disease
- institutional care

to.....

decentral

private payments

self care

generalist care

self-management

person centred care

quality of life

health and behaviour

care in-by the community

2015: new legislation, health care acts



Living, Support & Care for Older People PROGRAMME (WOZO, 2023)



Self...if possible

Home...if possible

Digital...if possible

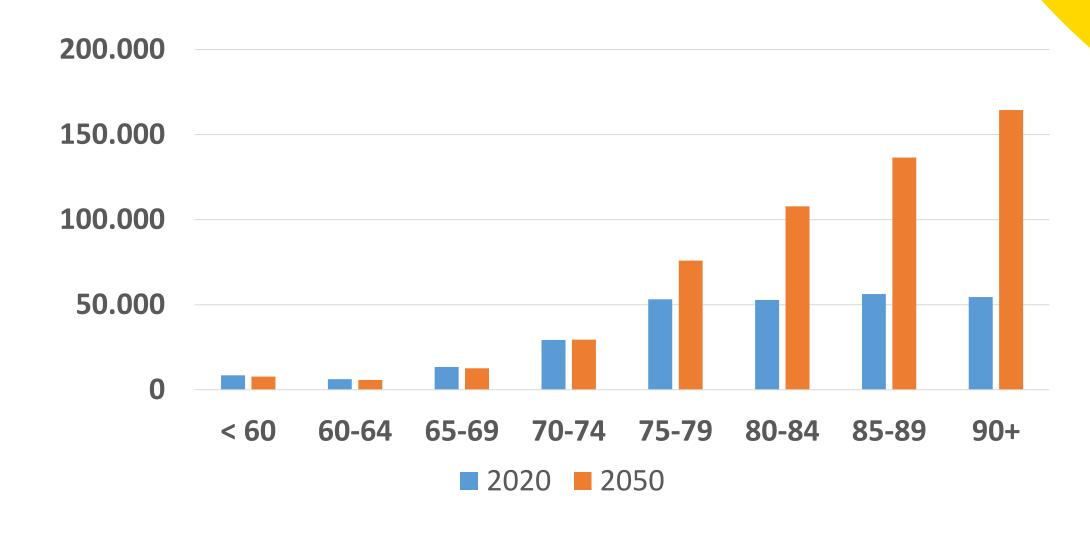


URGENICY









Opportunities Digital Care

- Independent living
- Eco-systems approach
- Support dementia client journey
- Value-based care solutions
- Informal carers working live
- Work efficiency of formal carers







ong-Term Care in The Netherlands

Vilans

The HAAL Project

Unitorm Value-Based Research







As a knowledge organization for care and support, Vilans works in various projects and programs to improve long-term care. We prefer to do this in co-creation with those involved from the field.



Founded in:

Employees:

Online visitors per year:

7 million

Organizations provided with knowledge:

20066550



People & Projects on Digital Care







- >40 (inter)national projects on digital care (many on dementia)
- >40 Vilans colleagues working on digital care projects
- Work with >120 other organizations
- Iterative co-design, value based & datadriven care!









Give an impulse to knowledge on the implementation of technology in care and support!





























Sharing Knowledge



Uniform Evaluation



Innovation in care



Accelerate together



International projects and communication





ong-Term Care in The.

Netherlands

Vilans

The HAAL Project

Uniform Value-Based
Research



European projects - Focus on...

- Co-Design
- Implementation
- (E)valuation
- Data driven care
- Responsible Innovation



Uitproberen

In gebruik

opschalen

Verkennen



Videocall app for family and loved

Also suitable for people without digital skills and or with (starting) dementia and 'forgetfulness'.

RESULTS: AAL SOLUTIONS ON THE MARKET



INDEPENDENCE



































Geschikt voor alle



vertaald naar overzichtelijke en beveiligde app die



Mantelzorger: gerust gevoel, minder





Kompy Nano

DAY-STRUCTURE







NFORMAL)CARE NETWORK

EXERCISING



SAFETY







Apps & Devices... also in long-term care







HAAL dashboard

aims to reduce workload and relieve stress;

for formal caregivers;

by combining information from several sensors/products in dementia care.









9 2009 - 2012: ROSETTA

Sensara is a product coming from the earlier AAL-project called ROSETTA. It was later researched again during the eWARE project.



2011 - 2014: FEARLESS





CogvisAI is a product coming from the earlier AAL-project called Fearless.

AAL

2017 - 2020: EWARE

Tinybots Tessa has been researched during the eWARE project of the AAL programme. Also Sensara has been researched during this project.



2018 - 2021: FREEWALKER



During the Freewalker project the device **Kompy Pico 4** was researched.

AAL

2019 - 2022: RESILIEN-T

The compaan was used in research of the earlier AALproject called RESILIEN-T.





2021 - 2023: HAAL







TIPR



WHIZTOYS



WHIZPAD





THE HAAL PROJECT





- Summary: 30 months, 8 partners 3 countries, 7 'following' partners, 5 external SME's, 9 products (TRL9)
- MTR Output: deliverables on time, codesigned prototype, 1st BC and high impact dissemination
- Primary end-user: care professional & person with dementia
- Primary outcomes: workload reduction & quality of care
- **Secondary outcomes:** quality of life, work pleasure, self-efficacy...
- Care goal: data driven care via a dashboard
 & based on sensors (TRL6)
- Main use-case: prevention and early detection

Vilans



HeAlthy Ageing eco-system for peopLe with dementia







The technologies



Light memory loss

Mild dementia

Mid-stage dementia

Advanced dementia





Compaan | Senior tablet



Medido | Medicine Dispenser































Tipr | Rehabilitation Game (hands)

WhizToys | Rehabilitation Game (legs)

Tessa | Social robot







Sensara | Lifestyle Monitoring



Kompy Pico | GPS tracker









174*1

Data overview













Casaccia S., Revel G.M., Scalise, L., Bevilacqua, R., Rossi, L., Paauwe, R.A., Karkowski, I., Ercoli, I., Serrano, J.A., Sujjkerbuijk, S., Lukkien, D. & Nap, H.H. (2019). Social Robot and Sensor Network in Support of Activity of Daily Living for People with Dementia. In: Brankaert R., IJsselsteijn W. (eds) Dementia Lab 2019. Making Design Work: Engaging with Dementia in Context. D-Lab 2019. Communications in Computer and Information Science, vol 1117. Springer.











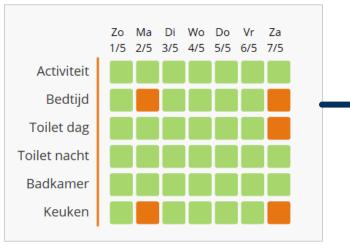


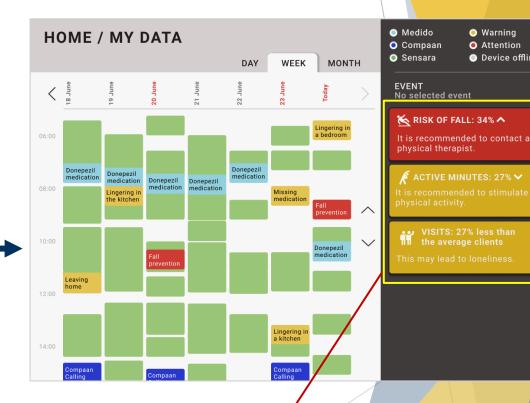












Warning

Attention

Device offline

Recommendations



Meaningful tryouts

&

Co-design









Three pages

- Patient profile: details on one patient
- List of patients: one quick glance to see all patients
- Notifications: urgent situations









END USERS' INVOLVEMENT



Realisation

Study 1:

User Requirement Investigation

Study 2:

HAAL devices demonstration

Study 3:

Prioritisation survey

Study 4:

Annotation

Study 5:

Co-creation & Responsible innovation

N=157

N = 49

N=50

N=46

N= 31 (3 experts) and ongoing...

End user organisations























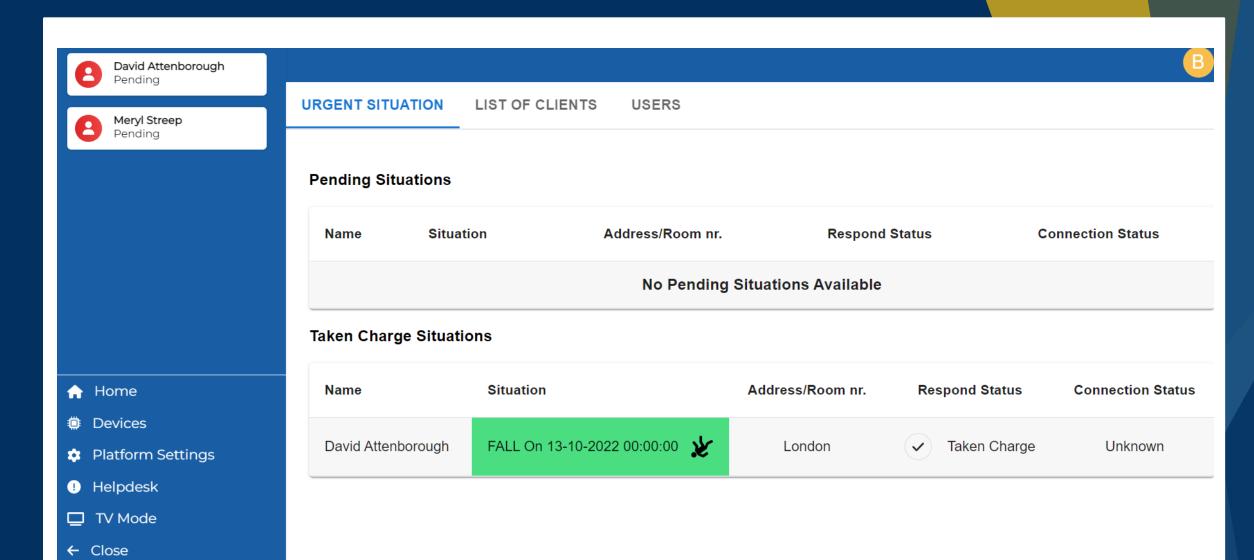




ICT FOR AGEING WELL

Mockup dashboard





(→ Logout



Meryl Streep
Pending

- ★ Home
- Devices
- Platform Settings
- ! Helpdesk
- ☐ TV Mode
- ← Close
- 〔→ Logout

URGENT SITUATION

LIST OF CLIENTS

USERS

Search

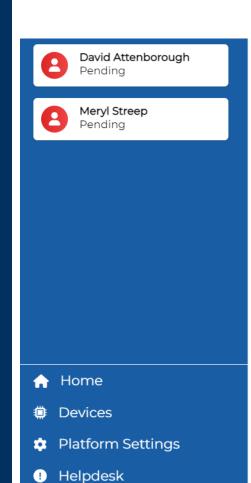
Q Insert name and/or surname

Filter by preferred:



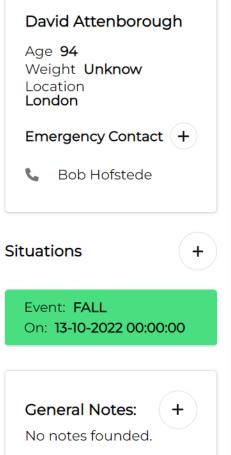
Name	Address/Room nr.	Age	Weight	Dementia Level
David Attenborough 💙 🔌	London	94	Unknown	LOW
Meryl Streep 💚 💸	New York	71	58	LOW

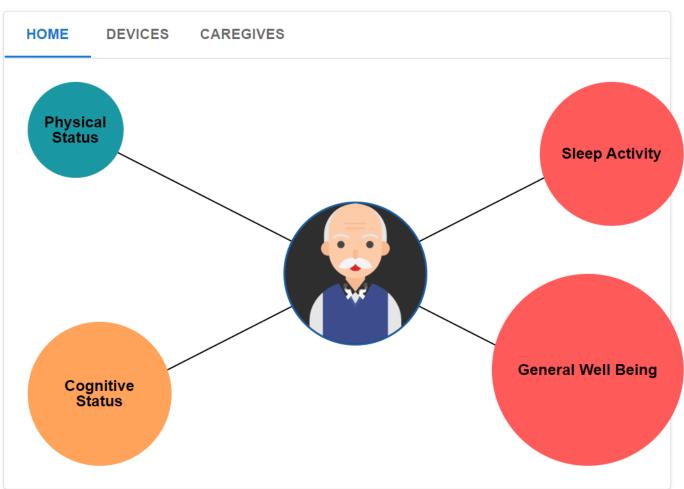


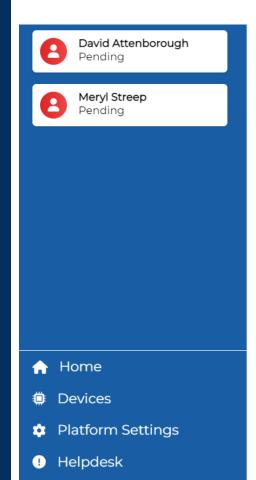


□ TV Mode

← Close

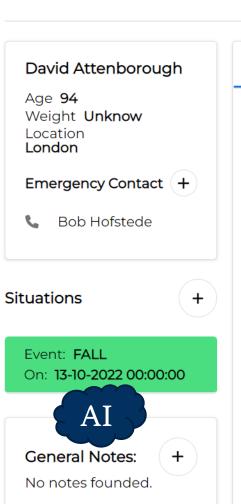


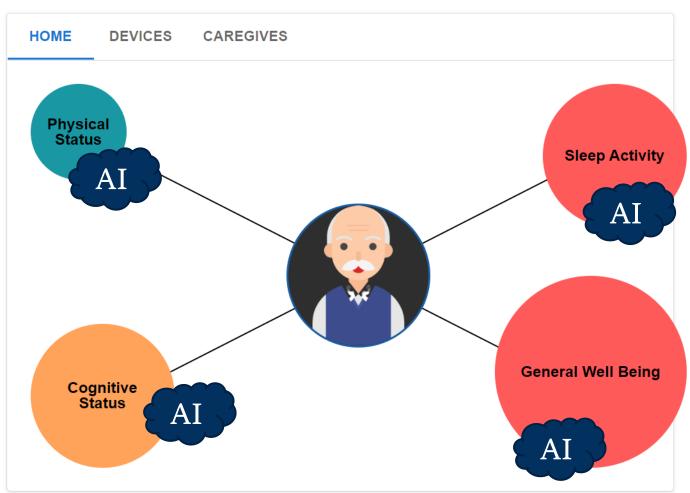




□ TV Mode

← Close



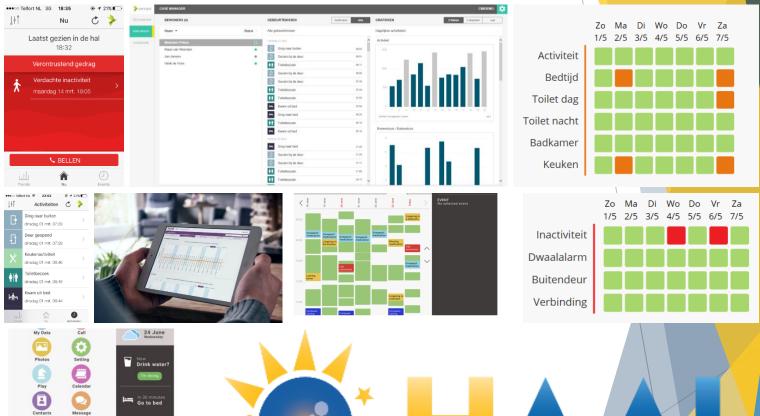


Al-driven dashboard

By Italian partners (UNIVPM & JEF)







EARLY DETECTION & PREVENTION

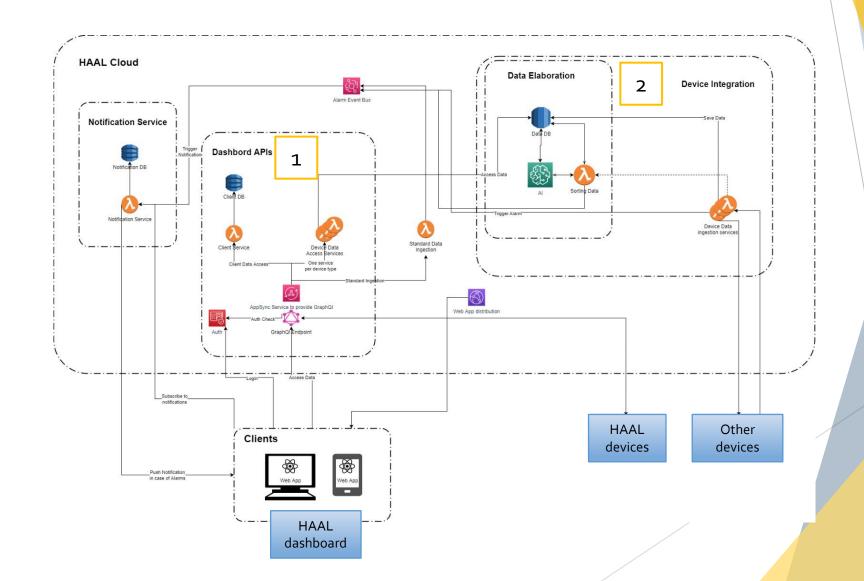


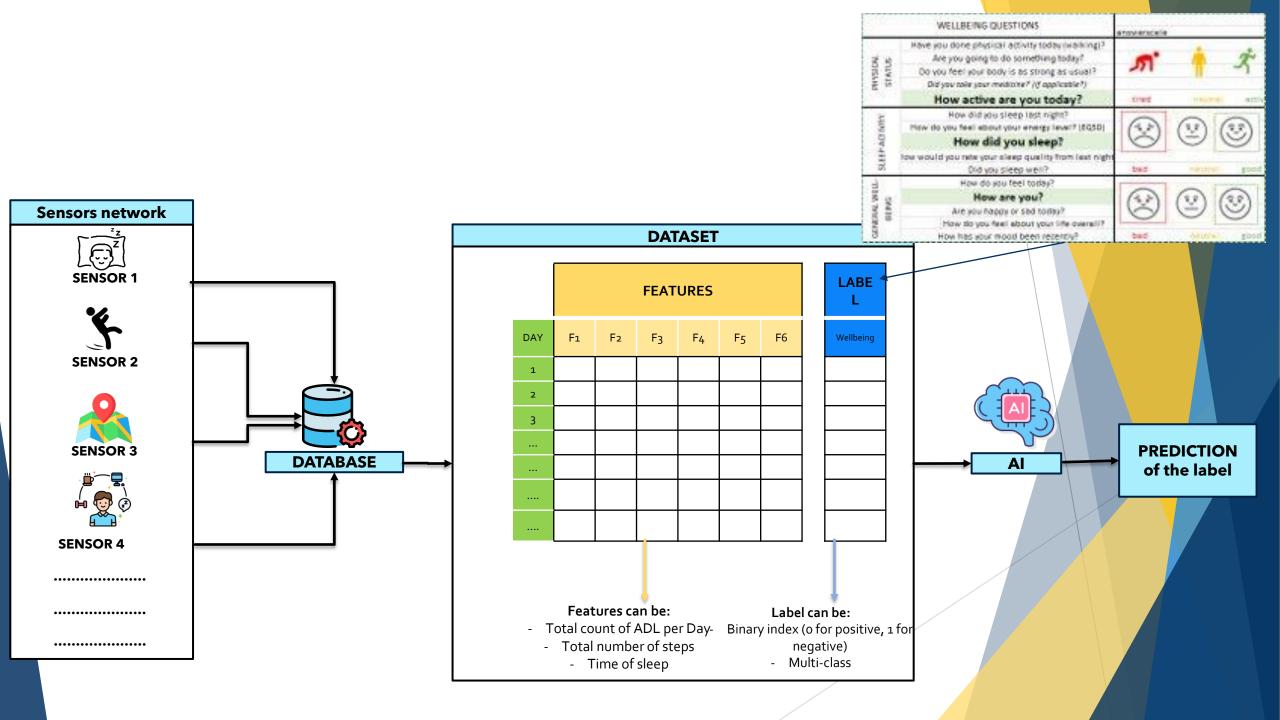
Go to bed





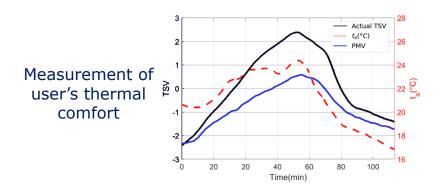
HAAL Platform & System architecture





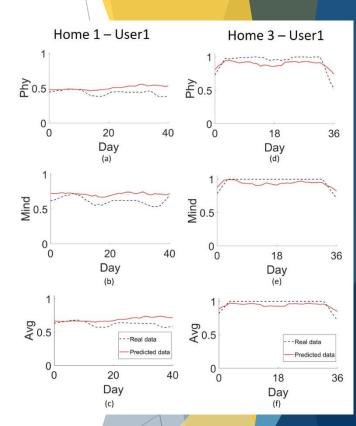
Artificial Intelligence

 Considering our background and literature related to AI and well-being the following algorithms have been selected: SVM, RF and CNN.



Measurement of user's indices of wellbeing

- The AI strategy will be iteratively enhanced from data collected during alpha to the beta pilot. Alpha pilot are used for the training, while Beta pilot will be used for testing, refinement, finetuning.
- The sensor network for each user can provide more than 200 rows of data daily; the total amount of collected data during Alpha and Beta test is expected to be of order of GB. Previous experience have pointed out that 2 months of training and at least 1 month of testing can provide satisfactory results.





Preliminary result

Application of AI algorithm on an example of aggregated dataset, using the well-being survey as ground truth for the wellbeing measurement:

	Features from the SENSARA (Occurrency)						Features from the WhizPad			
	KITCHEN ACTIVITY	BATHROOM ACTIVITY	OUTSIDE	INSIDE	KITCHEN ACTIVITY IN THE MORNING	EFFICIENCY	TOTAL SLEEP TIME	TOTAL TIME IN BED	WB_SURVEY	
							hh:mm	hh.mm		
Day 1	2	3	1	3	1	0.91	6.17	6.04	3	
Day 2	4	3	3	1	0	0.86	7.13	6.04	3	
Day 3	1	1	0	2	0	0.73	6.35	6.05	2	
Day 4	2	2	1	1	1	0.82	7.93	6.05	3	
Day 5	2	0	1	2	1	0.78	7.61	6.06	2	
Day 6	0	0	2	0	1	0.54	7.83	6.07	2	
Day 7	1	3	1	1	0	0.71	7.38	6.07	2	
Day 8	1	3	1	1	0	0.77	7.54	6.08	2	
Day 9	0	2	2	1	0	0.93	7.28	6.08	3	
Day 10	1	4	1	1	0	0.69	6.89	6.09	2	
Day 11	0	2	1	0	0	0.70	7.66	6.09	3	
Day 12	1	3	2	2	1	0.61	7.56	6.12	2	
Day 13	3	1	0	3	1	0.89	7.92	6.13	3	
Day 14	2	4	0	0	1	0.73	7.74	6.13	2	
Day 15	0	0	2	1	0	0.71	7.20	6.14	2	
Day 16	0	1	1	0	0	0.50	7.45	6.14	2	
Day 17	4	1	3	1	1	0.92	7.02	6.15	3	
Day 18	0	2	3	0	1	0.94	6.46	6.15	3	
Day 19	1	1	0	1	1	0.71	7.04	6.16	3	

2. Chosen algorithm: Random Forest Training dataset: 60%

Testing dataset: 40%

Performance evaluation: ACCURACY 94% on simulated Actual Survey

17

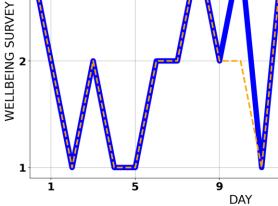


GOOD









Predicted Survey

How do you feel today?

'BAD' = 1 'NEUTRAL' = 2 'GOOD' = 3

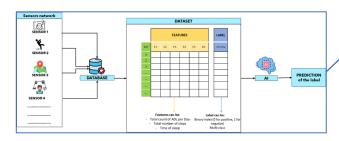


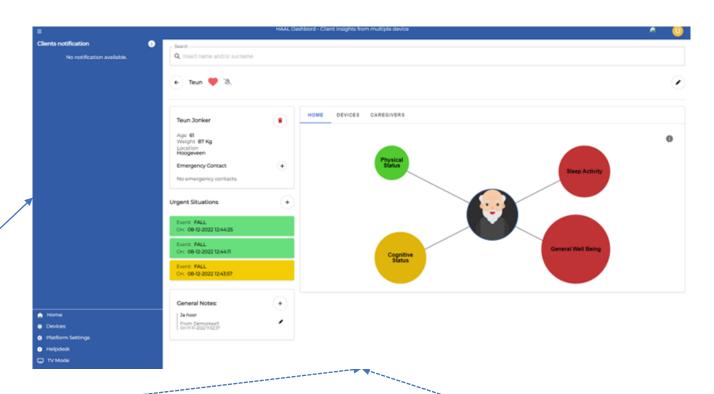


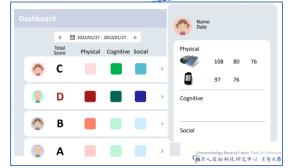
ALPHA PROTOTYPE

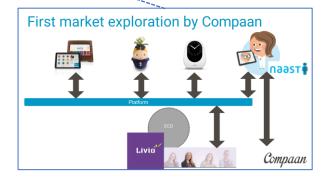


















Everyday
Ethics
for Artificial
Intelligence

Responsible



A



machine intelligence

PERSPECTIVE https://doi.org/10.1038/s42256-019-0088-2

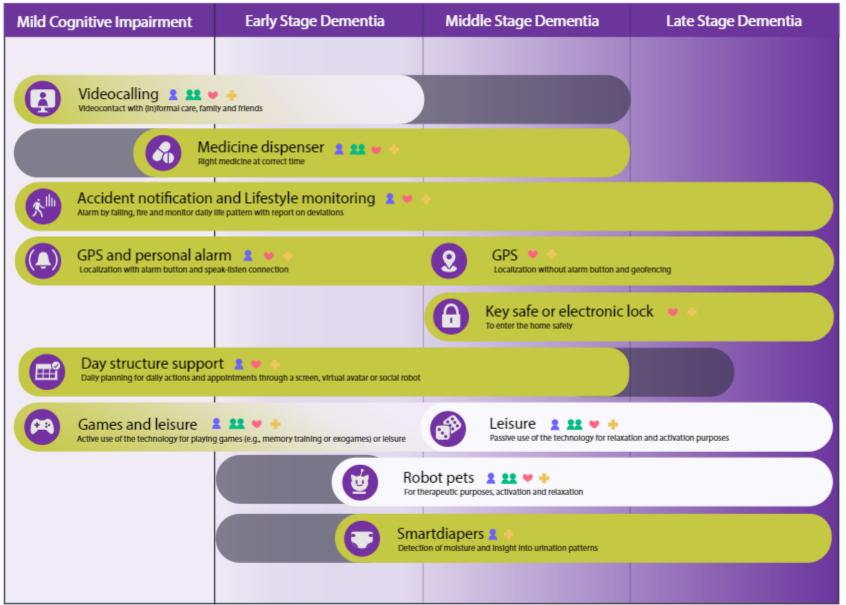
The global landscape of AI ethics guidelines

Anna Jobin, Marcello Ienca and Effy Vayena*



Technology for people with dementia

Supportive technologies per dementia stage





The grey balk indicates the possibility of longer use or early implementation.

Indication of the user of the technology and who is involved with supporting the use of the technology.

- People with dementia
- Person with dementia and informal caregiver together
- Informal caregivers
- Professional caregivers
- Care technology
- Leisure technology
- Both care and leisure technology

Disclaimer 1

This infographic only provides a guideline for the implementation of care technology for people with dementia. We cannot guarantee that these guidelines are applicable to every individual with dementia and are always effective. It is important to note that the effectiveness of the implementation of care technology is depended on various contextual factors, such as personal characteristics, background and technical experience. Moreover, care technology can vary a lot in terms of the form factor and interaction styles which can also influence acceptatibility.

Disclaimer 2

The suggestion provided in this guideline are not set in stone. Technologies could possibly be implemented in other stages as well depending on the person with dementia and their own personal preferences and characteristics. It is important to also go into conversation with the person with dementia about the implementation of care technology and to create a pleasant atmosphere in such conversations to see which technology fits best depending on their needs and to try out technology.

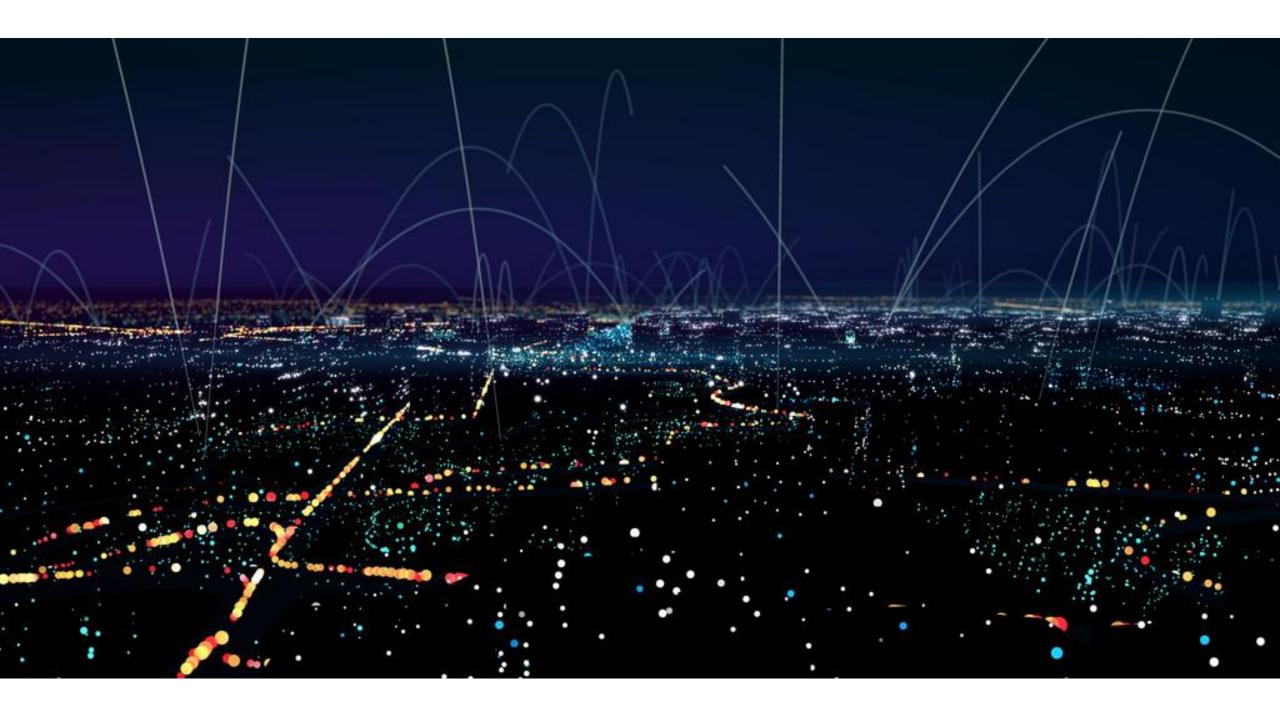
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Uniform evaluation of digital care

Toelichting bij 4: Voor de waardebepaling in de praktijk van slim incontinentiemateriaal zijn de analyses van Vilans als basis gebruikt



De methode van het Zorgtransformatiemodel is nog in ontwikkeling. De samenwerking met het Kenniscentrum van Vilans op slim incontinentiemateriaal is een 1e verkenning waarmee ook de methode van het Zorgtransformatiemodel wordt aangescherpt

Voor meer informatie zie bijlages 3a - 3d

Onderdelen waardebepaling in de praktijk 4a. Passend bewijs Methode waardebepaling Hypothesen en uitkomsten Uitleg mobiliteit categorieën Kwaliteitswinst Toegankelijkheid Harde/zachte kosten baten Betaalbaarheid - opbrengst 4b . Drijvers voor succesvolle opschaling en implementatie ervaringen

De onderdelen zijn op maat gemaakt. Daardoor wijken ze enigszins af van het format van Waardebepaling op sheet 4. Op hoofdlijnen zijn de lijnen echter overeenkomstig

Toelichting bij 4a: Methode waardebepaling

- · Participerend actiegericht onderzoek - Quadruple Aim
- 2019-2021

Z

- 10 zorgaanbieders
- · Observatiestudies & vragenlijsten
- 100 tijdsmetingen (met & zonder slim incontinentiemateriaal)
- 143 cliënten
- · 25 interviews bij projectleiders, innovatiemanagers & locatiemanagers



Het Zorgtransformatiemodel



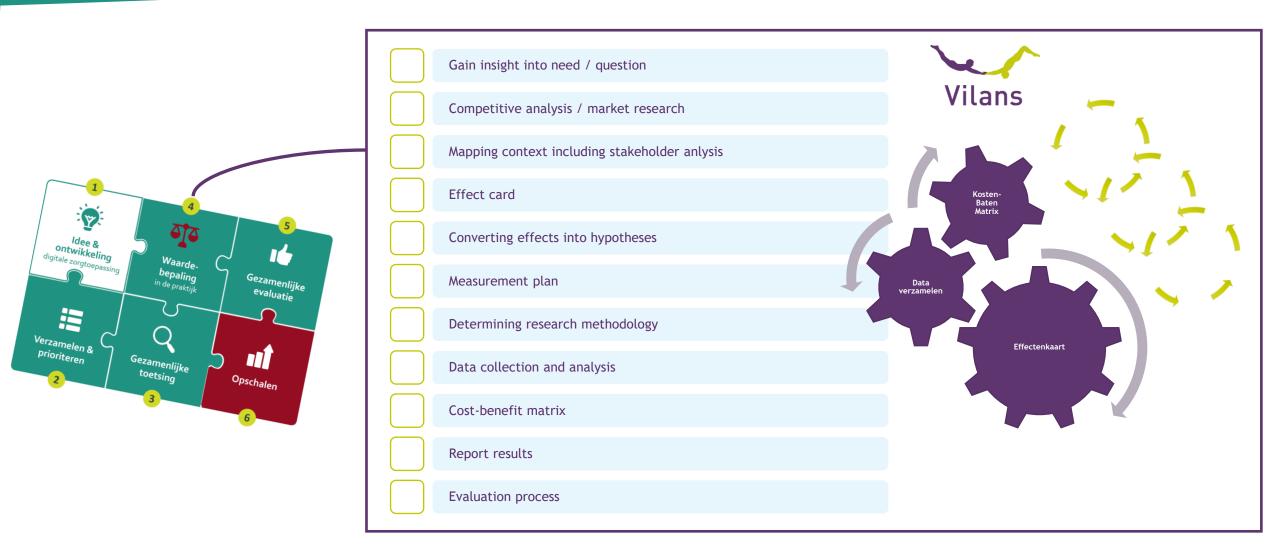


HARD COSTS	HARD BENEFITS
SOFT COSTS	SOFT BENEFITS





Vilans' Valuefan for the evaluation of digital care in practice



Workload reduction*





+/- 22 minutes per day per client









Smart Diaper

+/- 5 minutes per day per client





Hip airbag

+/- 16 minutes per day per client



Bedsensor

+/- 5 minutes per day per client



Research AgeTech Works 2022-202X

Daystructure support / Sleep well / Low workstrain / Feeling safe

- Exoskelton
- Helpsoq
- Nobi
- Wolk Shorts
- Skincair
- Into Dementia (VR)
- Tinybots Tessa
- Momo bedsense
- Medicine dispenser





















FUTURE FOCUS OF VILANS

- 3 large themes: digital care, personalized integrated care & informal care
- Focus on life, prevention, sustainability, workload reduction, implementation
- Smart knowledge sharing, knowledge brooker, what people need
- 9 new (inter)national programmes: home care, people with dissabilities, etc.



DIGITAL CARE KNOWLEDGE PLATFORM



www.vilans.nl/kennisbank-digitale-zorg/

Kennisbank Digitale Zorg

Own in Nederland is de song being met moorde, nedersom de implimentative und sightle very. By well planten werden desselble splategous objegenheiser. Det sensithens om plates on andress experientative worden meg meur weinig gesteler. Ab. to behand in weit die verwinsigen met en invensioni-sig, des absense andresse deursen gesteleren. Ab. des open traplates werd gesteler, des bevonen andres expressablesieren skredlike renkleise gestrelhen zodet de impect unteller werdt angestenout. Der gestramlijke westerdeutsging met hie denne un versteller kwester sungstenout. Der gestramlijke westerdeutsging met hie dien un versteller kwester spilligerichte skyrzben over behandigsips werden symmekt. Om in dere behandte hie worzien, hand Villam het bildridg genumen vom der het miniskelt. Spillar Zeroz.

De Kennshank Biglale Zorg is een cenfrad guelt voor het delen en opbalen van kennis over digitale zorg. De Kennishank lewert een infrastructuur voor het delen van kennis over (best) practicion, ervaringen met plotos (leusons learned), de opset van plots, informatie over waardebepoling uit onderzoek en Erancieringsmogelijkheden.

llienne de Kornishank werken verschillende organisaties samen, met als deel om hun versringen to deine net kernen tet en en ombeie in de methiekek in tale en onderzeek. De Kornishank fligitale Zerg deelt onsthrekelijke informatie over verschillende typen zergetechnologie, de barte en zedde konten en tates en hije in dette treedstierens. Wilde tospassingen dragen bij aan het Citistankrijk, het werkgelek van de mechaniske net de sicher verschiede Silvan wilde protest in die ontervenieren werdende verschild methieken zerk de sicherheld Niemen wilde protest in die ontervenieren werdende verschild methieken zerk de sicherheld Niemen wilde protest in die ontervenieren werdende

Dankrij de Landelijke Kennistank Digitale Zorg als platform voor kennis- en informatieuitwisseling wordt het mogelijk om innovaties sneller te evalueren en te teoordelen zodat es versnelde opschaling mogelijk wordt.

echnologieën





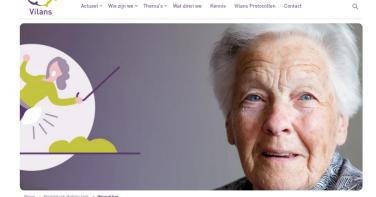




me inco Heu



Kennisbank digitale zorg Lantuginumming Radiaken mang Madaken mang Madaken mang Madaken mang Madaken mang Madaken mang Lantuginum Lantuginum Contactpersoon We hak therman Ne



Heupairbag

Wat is het?

Een heupairbag is een riem of broekje met luchtkussentjes aan beide zijden van de heup die voor een zachte landing zorgen als iemand valt. De sensoren in de riem monitoren continu iedere beweging en herkennen direct een val. CO2-patronen in de riem zorgen ervoor dat de airbags opblazen. Na een val moeten de patronen worden vervangen.

Doelgroep

De heupairbag is bedoeld voor:

- Mensen met een verhoogd valrisico en het dragen van een airbag accepteren.
- Mensen in een rolstoel en de neiging hebben om op te staan
- Mensen 's nachts vergeten dat ze lastig lopen en wel loopdrang hebben).

Kennisbank digitale zorg

Beeldschermzorg Elektronisch toegangsbeheer

Leefstijlmonitoring Medicijndispenser

Ondersteuning dagstructuur Slim incontinentiemateriaal Zelf onderzoek aanleveren

Contact of vragen?







www.vilans.nl

h.nap@vilans.nl

linkedin.com/in/henkhermannap/









 ${\bf Academie Nieuwezorg}$











