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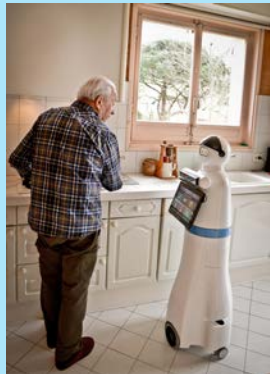
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# MARIO

Managing active and healthy aging with use of caring service robots



**Living Well with Dementia in Rural Ireland**  
**May 29, 2017 | Peacocks Hotel | Connemara | County Galway Maam Cross**

- Dementia -impaired: mental functioning, language and thinking.
- Dementia affects confidence to engage in social activities
- Lonely and isolated
- Significant burden on individuals and support systems
- Using normal technology can be a real challenge
- **More sophisticated innovative** easy to use technology needed
- Recognises the cognitive abilities of PWD
- Engagement in **meaningful activities** which reduce loneliness and isolation

**MARIO addresses this need through the use of companion robots.**

# MARIO: Managing active and healthy aging with use of caring service robots

- Aims to address the difficult challenges of loneliness, isolation and dementia in older persons through companion/service robots.
- 10 partners from 6 Countries- France, Italy, Greece, Germany, Uk, Ireland
- 3 pilot sites for the introduction of MARIO robot –
  - Italy (Acute Hospital) , UK (Community) & Ireland (Nursing Homes)
- Value of Grant: €4million
- Duration 3 years February 2015- February 2018



# The Robot - MARIO Kompai



<http://www.robosoft.com/news/kompai-at-the-2nd-wic-award/index.html>

To find out more go to <http://www.mario-project.eu/portal/>

## Why a companion robot?

- 30% of PWD are lonely
- MARIO uses enabling technologies; focuses on:
  - Promoting social connectedness, autonomy
  - Reducing isolation
  - Enhance QOL and slow deterioration



## Why MARIO?

- An iPad /smart phone- can be too complex to access and use.
- iPad disembodied.
- MARIO specifically developed and designed with PWD and carers
- MARIO has
  - An embodied voice
  - easy-to-use interface;
  - a carer/ family can personalise it to individual needs and preferences

# User Led design

- Identify key requirements that PWD and Carers would like MARIO to have & be able to do, to reduce loneliness and isolation of PWD and enhance connectedness
- What would make MARIO acceptable?

## Interviews

- PWD  
NUIG=29; Stockport=15;  
IRCCS=4  
**Total=48**
- Carers  
NUIG =49; Stockport=10;  
IRCCS=20; R2M=13  
**Total=92**
- Relatives: NUIG=7

# Pilots





# Italian pilot site

## Italy - MARIO in Hospitals

- Led by IRCCS Casa Sollievo della Sofferenza
- Acute geriatric department (40 beds)
- Focus on Comprehensive Geriatric Assessment and Multidimensional Prognostic Index
- Short time interaction with PWD (7-10 days)



# Stockport pilot site

## United Kingdom- Stockport Mario in the community

- Led by Stockport Council
- Mostly concentrating on home based testing
- Involving Educate - people living with dementia - volunteer led



# Irish pilot site

- Long-stay residential care setting



# Perceptions of people with dementia and carers on robot companions (MARIO)



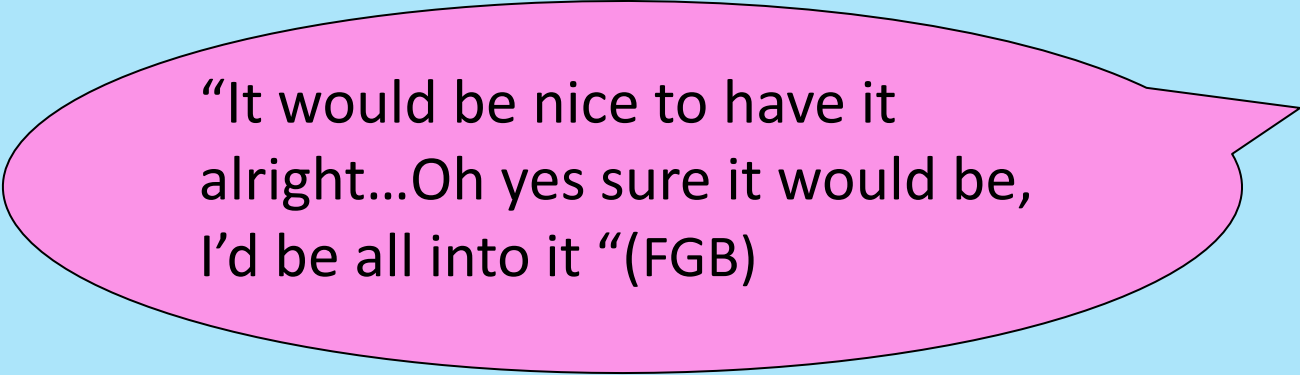
# Methodology

- Three focus group interviews with people with mild/moderate dementia.
- 2 Focus groups with health care staff in nursing homes
- Qualitative content analysis was used to analyze the data
- Criteria identified by Lincoln and Guba (1985) was used to ensure and maintain rigor
- Ethical approval obtained



# Findings

- The majority of participants were receptive to the idea of having the robot companion Mario Kompai



“It would be nice to have it alright...Oh yes sure it would be, I’d be all into it “(FGB)

# What I would like Mario Kompai to do for me

- Recognise peoples individual voices and remind me of daily and weekly events;
- Store my phone numbers and important events like birthdays and anniversaries;
- Store and play on demand my favourite music and movies;
- Remind me to take my medications, and to eat and drink;
- Contact medical help if I fall or am unwell;
- Know the lay out of my home so he can direct me e.g. to the bathroom;



- Locate my keys or handbag
- Know my favourite book and read it to me
- Have interactive games that I would enjoy and would help me retain my abilities for longer
- Recognise faces so he could prompt me as to who people were.
- Interact with and regulate other technologies in my home

- Motivate me and deliver words of encouragement when I'm less inclined to do something e.g. 'lets do it' "Don't give up" " come on have a go" .
- Remind me what clothes to put on when I get muddled e.g. put your underwear on first Mary, ...now put on your dress"
- Play soothing music to me at night and to gently wake me in the morning
- At the start of the day tell me the date and time and year and a list of the day's activities and events planned for that day.
- Remind me that I had visitors earlier in the day and who they were as sometimes I forget and think no one has visited?

# Appearance

- To speak more like a human maybe have the voice of someone I know
- But others thought that a familiar voice would be confusing
- The voice needs to be clear, he needs to speak slowly and a bit loudly so we can hear
- To have more softer or warm features- 'he is like a fridge'
- Could he have some hair? Can we put a shirt of some clothes on him to make him a bit more friendly looking?
- Could he have a bright warmer colour
- Can he appreciate humour and 'have a laugh' with us.

# Concerns

- He needs to be robust, what if we accidentally knock into him or maybe we could even fall over him?
- Where will he hold all his information, on a 'chip in his head? 'Who can access my information that he has?
- Will 'my secretes' be safe with MARIO?
- Who will have access to the information that I give to MARIO and he has in his memory?
- Will he share private conversations that I have with one family member with another family member? Will he tell my business to someone else?

# Staying Connected

- Most participants recognized the potential of Mario Kompai to keep them connected to family and friends
- Wanted him to have skype and thereby connect them to their friends and family

*“...I could talk to my girls on skype” (FGA)*

- Wanted him to have access to their life history/life story, their interests and hobbies and could use this information to foster conversations and reminisce about events that they could remember more easily.

- It is clear that that Mario Kompai has to really get to know the person and their daily routines

“...{Its} building in the person’s routine so it’s like you’re getting up, you’ve got to go to the toilet, you’ve got to brush your teeth, you’re going to have your breakfast now so it’s the routines as well as the memories but the routines I think are important...”(FGC)

# Demographics of health professionals

- Nursing Home A (n=23)
  - Female (n=20) Male (n=2) 1 did not answer
  - Majority (n= 17 ) >40 yrs.
  - 13 RGN's 6 HCA 2 Activity Cord. 1 Physio. 1 OT.
- Nursing Home B (n=26)
  - Male (n=4 ) Female (n=21 ) 1 did not answer
  - Majority (n=18) >40 yrs.
  - 15 RGN's 7 HCA 1 Activity Cord. 1 Physio. 2 OT.

# What we would like in Mario Kompai

- **All welcomed the idea of MARIO and were keen to meet him in person!**
- Have MARIO undertake some of the Comprehensive Geriatric Assessment,
- Have a falls detection sensor; Sensors to pick up the residents physiological status;
- Voice activation and face recognition
- Ability to skype ; take photos of the resident to share with family members
- Record visitors names and details when they visit?
- Orientate residents to time place and date ;
- Must have the persons life story and be individualised to each person.
- Be able to read out local parish newsletters, show local football games on his TV screen; the horse racing etc.
- Identify someone in distress in terms of their emotional wellbeing



- Could he smile, express some emotion, appear to make eye contact
- Needs to speak like a human not a computer or a 'sat nav'
- Maybe give him a wig and put a shirt on him, make him more friendly

# Concerns

- Space
- Privacy and confidentiality of the information stored in MARIO.
  - Who owns that information? How will it be stored ? Will the information be backed up and will it be safe?
- Needs to be robust as they could hit him with their stick on the head or the body.
- Who will be responsible for MARIO when he is in the home, what if his system crashes while he is here, how does he reboot?
- Will MARIO replace the need for a nurse ?

# So what does this mean for MARIO?



- Prompts the PWD maintaining memory
- Engages PWD in individualised meaningful activities
- Enables PWD to use technology and reduce dependence on others
- Talks to the person; Facilitates & supports choices
- Connects PWD to family & friends
- Personalised activities based on life history
- Has an UI which is simple and intuitive



# Stay up-to-date on the MARIO Project at:

- <https://www.facebook.com/mario.project.eu>
- <https://plus.google.com/116012490277146118083/posts>
- <http://www.mario-project.eu/portal/>
- [https://twitter.com/mario\\_project](https://twitter.com/mario_project)
- <https://www.youtube.com/channel/UCdxaxbf9BLZjl698HCuTyBQ>
- Paper Casey et al 2016 is available at <https://aran.library.nuigalway.ie/handle/10379/5904>