

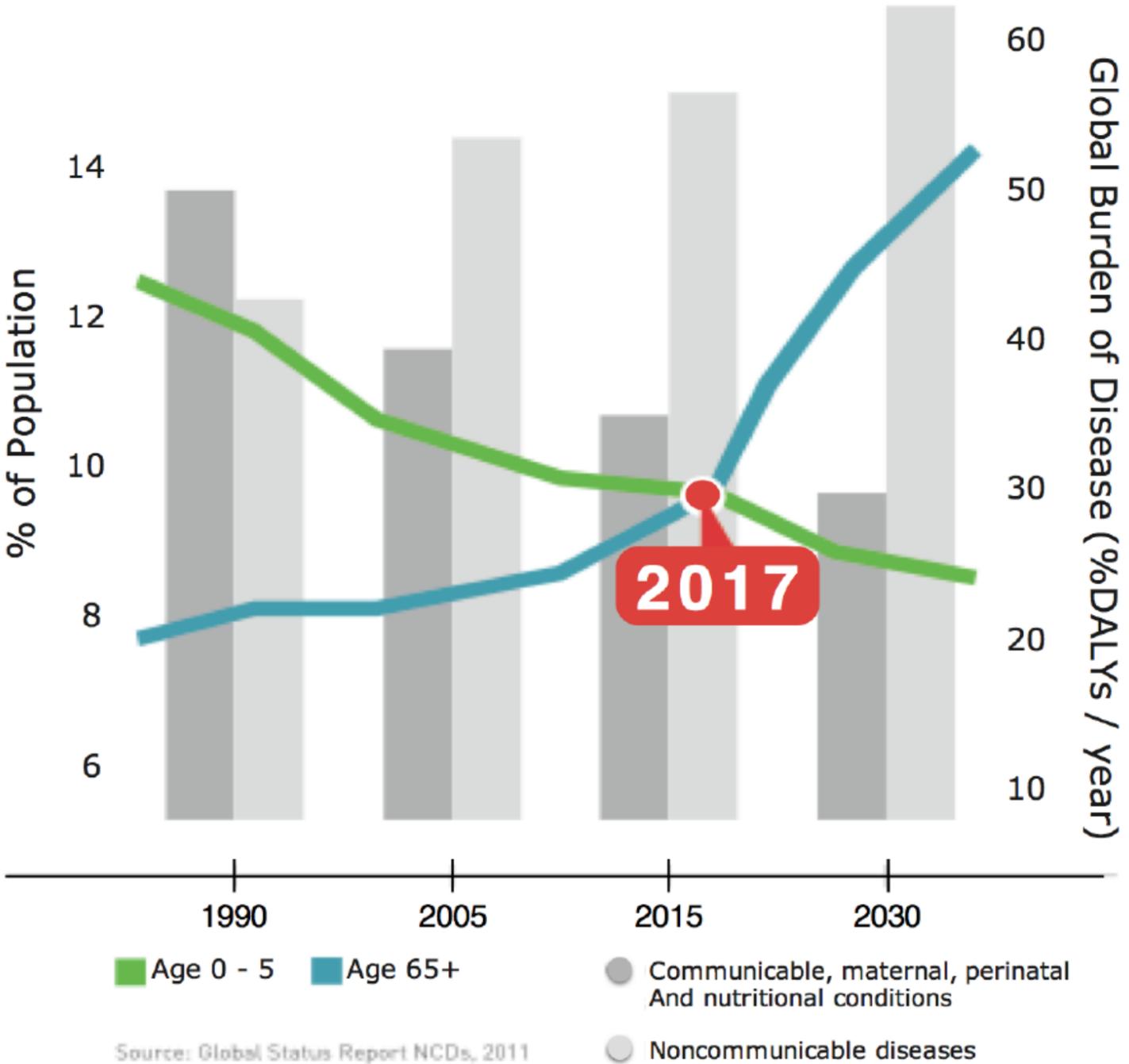
The background of the slide features a close-up photograph of a person's hair, showing a mix of grey and brown strands. Overlaid on this image are several large, solid blue geometric shapes: a triangle on the left side, a trapezoid at the bottom left, and a large, irregular shape on the right side that frames the main text.

Outthink Ageing

Ruoyi Zhou, Ph.D.
Director, IBM Accessibility Research

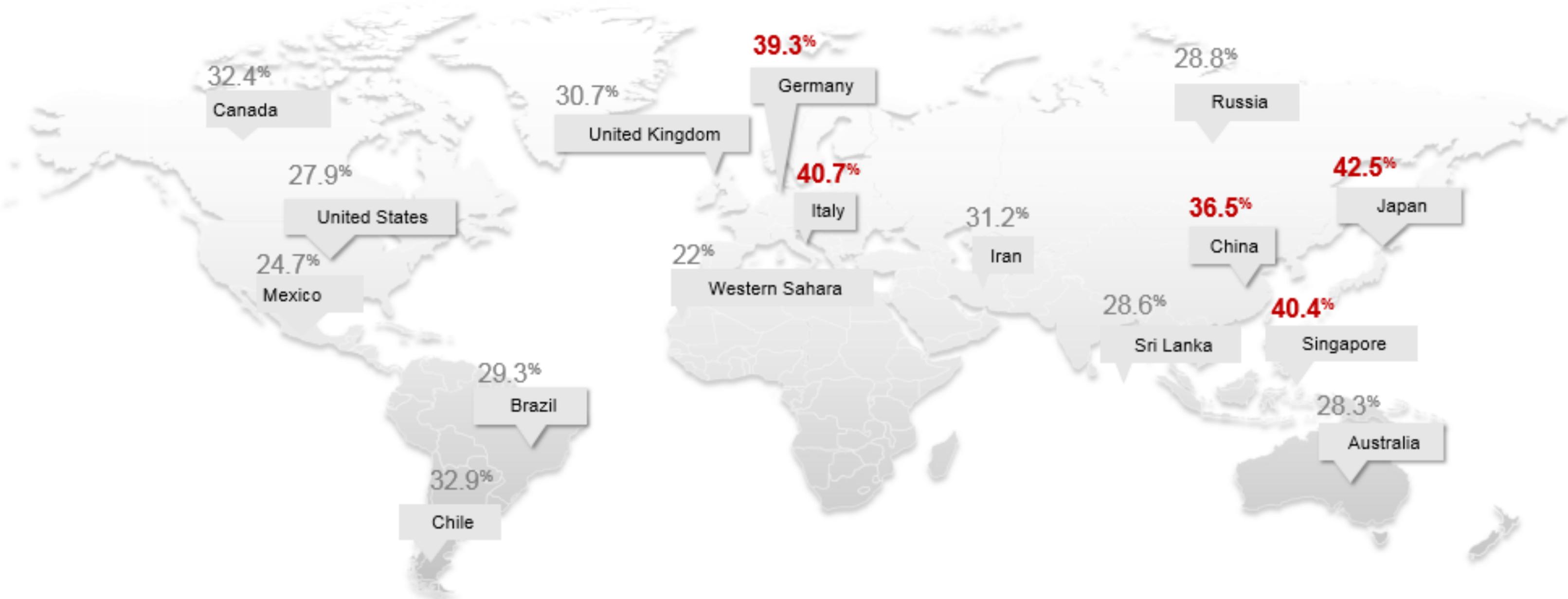
Agging: it's happening

The Tipping Point of Global Aging

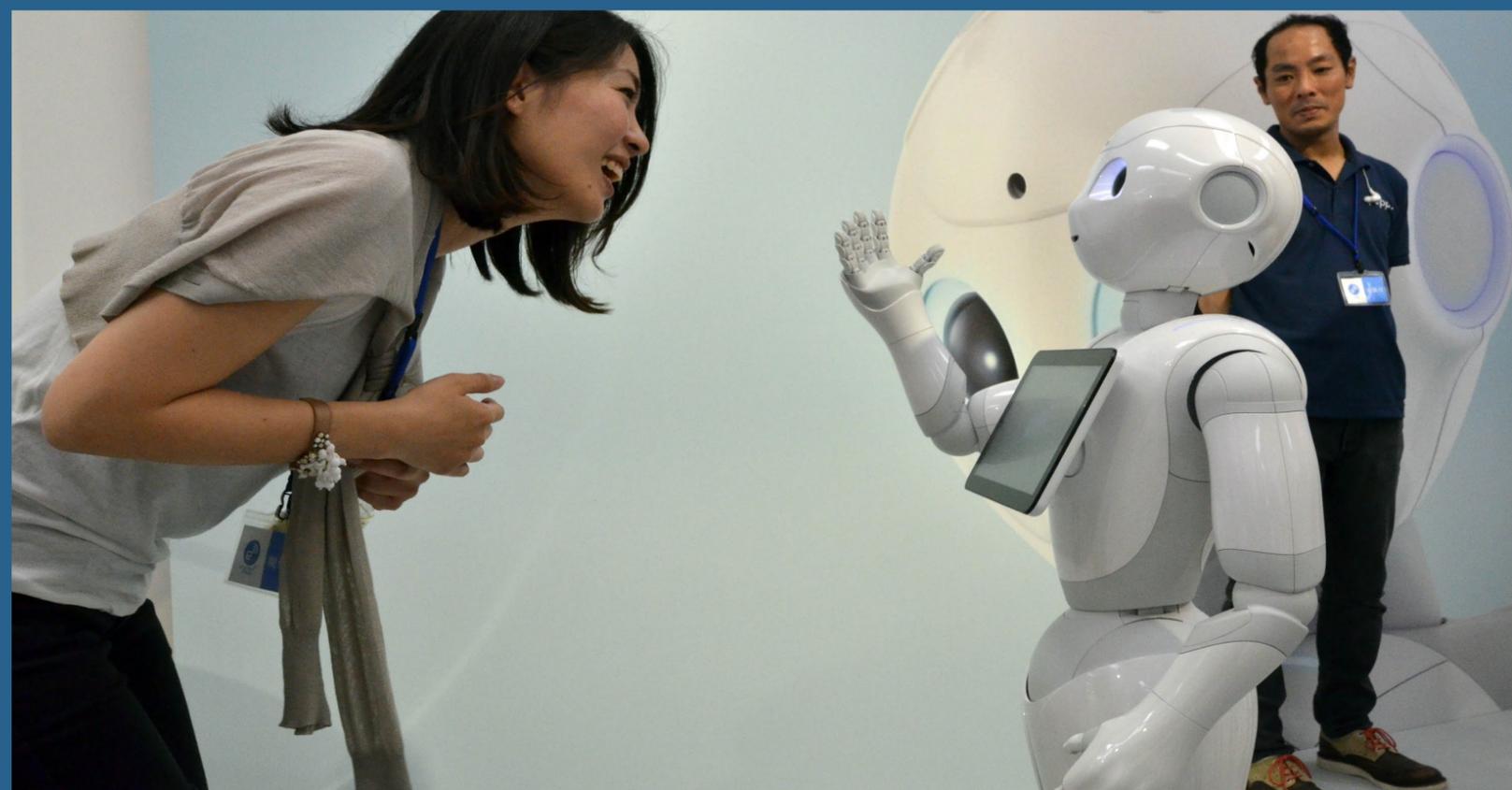
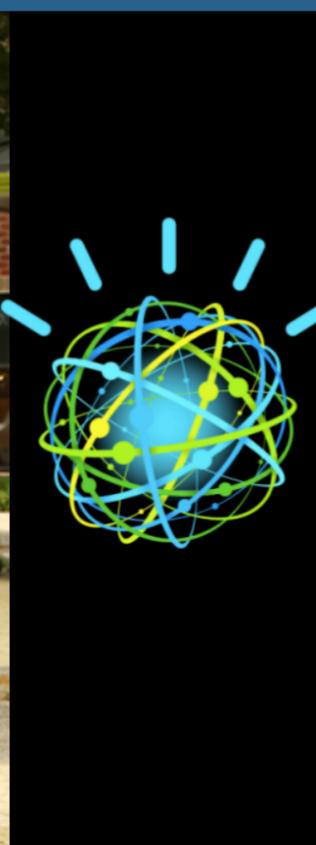


Global aging populations are steadily growing and increasing their share of the overall demographic

Projected percentage of the population greater than 60 years old by 2050

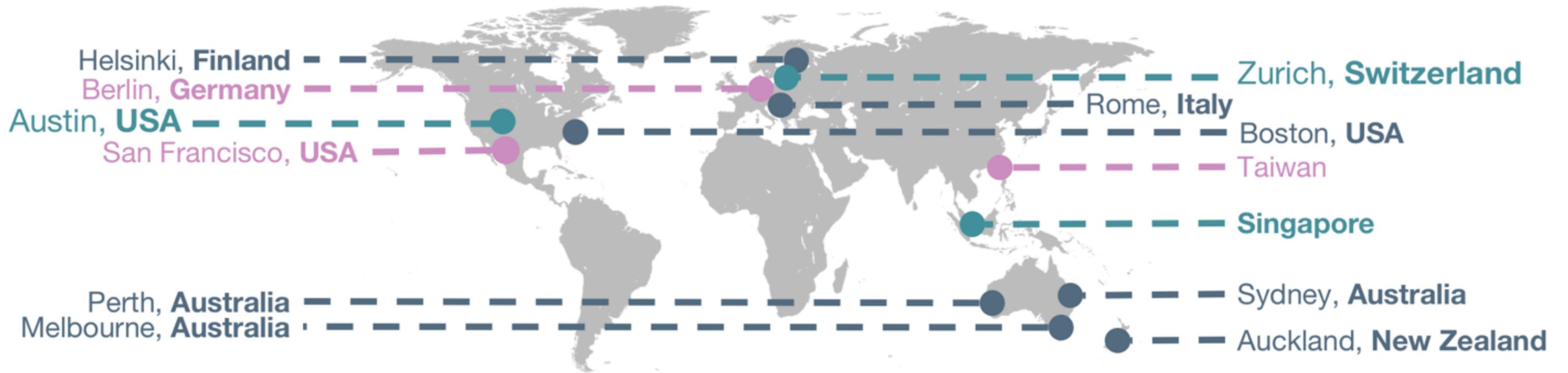


Technology: it's happening



Our approach:
listen, learn, interact,
play, test, apply in
real life (reiterate).

We learn by interactions with clients and stakeholders



Cross Industry Workshops

Locations: Singapore, Austin, Zurich

Individual Client Workshops

Locations: Auckland (NZ), Boston (USA), Melbourne (AUS), Perth (AUS), Sydney (AUS), Rome (IT)

Announcement Events & Conferences

Locations: Berlin (Germany), San Francisco (USA), Taiwan

>50 Clients Engaged Globally

Our Thought Leadership Research



ibm.com/able/aging

47%
of people worry most about losing their memory and suffering from dementia as they get older

35%
of people believe discussing assisted/long term care is the most difficult conversation to have with parents

1 in 3
people believe that smart homes & the Internet of Things will help manage the aging process the most



bm.biz/loneliness

Create new kind of village

Achieve new insights

Rebuild social capital

Some of the Top Challenges

Cost of Care



Home Health Care:
\$20 /hr

Assisted living:
\$3,600 / month

Skilled Nursing Home:
\$220 / day

Falling



1 in 3 adults over the age of 65
fall every year

Seniors died from falls each
year more than **doubled**
Between 2000 and 2013

The medical costs of falling run
more than **\$30 billion** a year

Loneliness

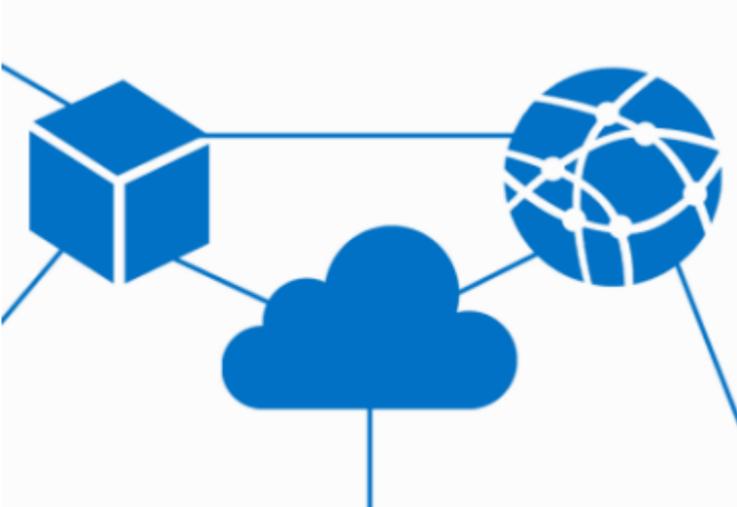


51% of people age 75 and
older live alone (*according to
AARP*)

Loneliness affects **25% to
60%** of older Americans
(*according to Harvard Health
Publications*)

Our Research Focus Areas

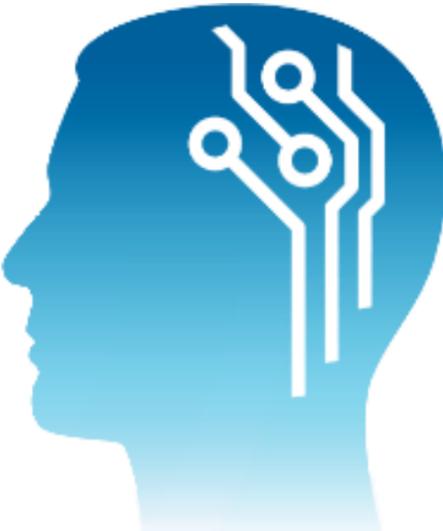
Cognitive IoT



Social Interactions



Fall & Cognitive Wellness



IoT Solution Client Case – Living Safe Project with City of Bolzano, Italy



A 6 month project to improve safety and quality of life of the elderly

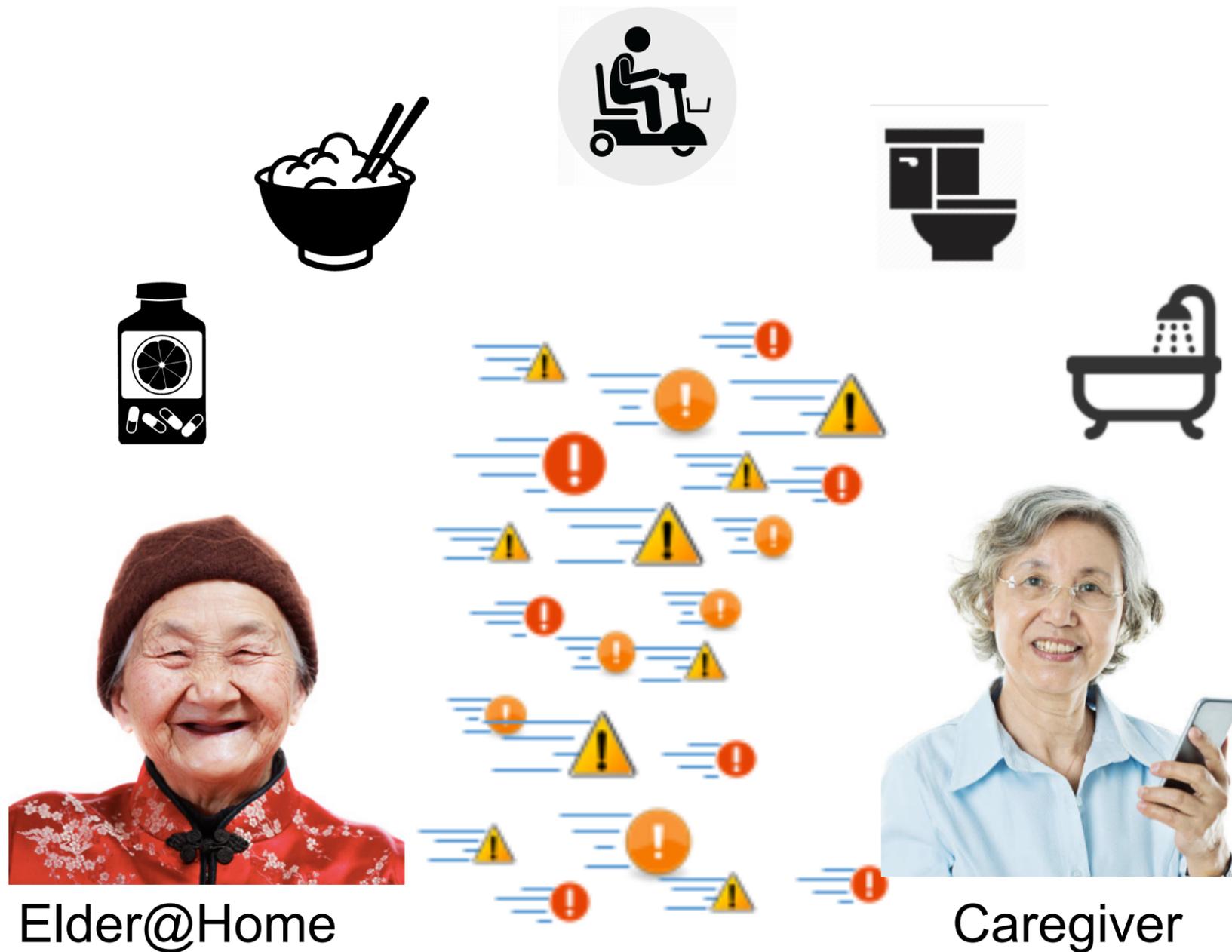
- Explore the use of new technology for remote support and security of the elders living at home
- Produce a business case for the government around a sustainable management and provision of services to a growing aging population

I felt safer

Very stimulating

Fulfilled my expectations

Challenges with IoT Solutions

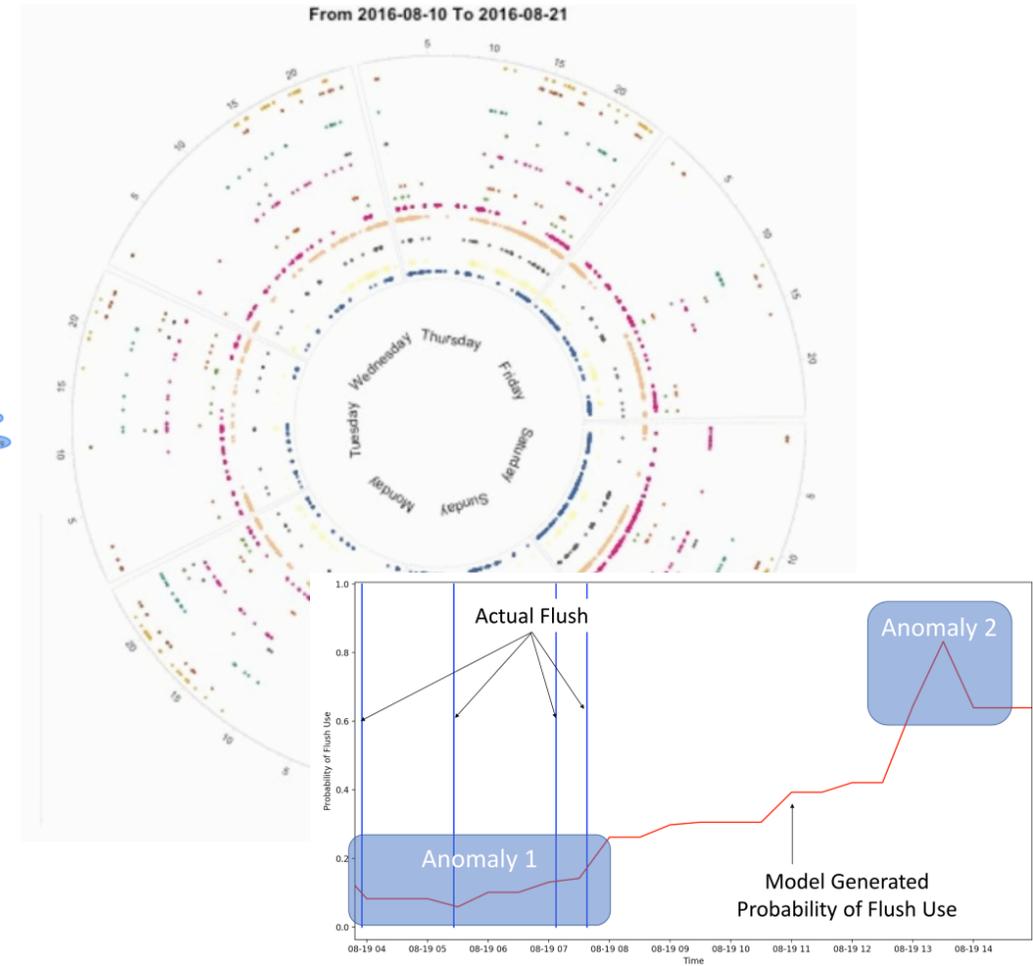
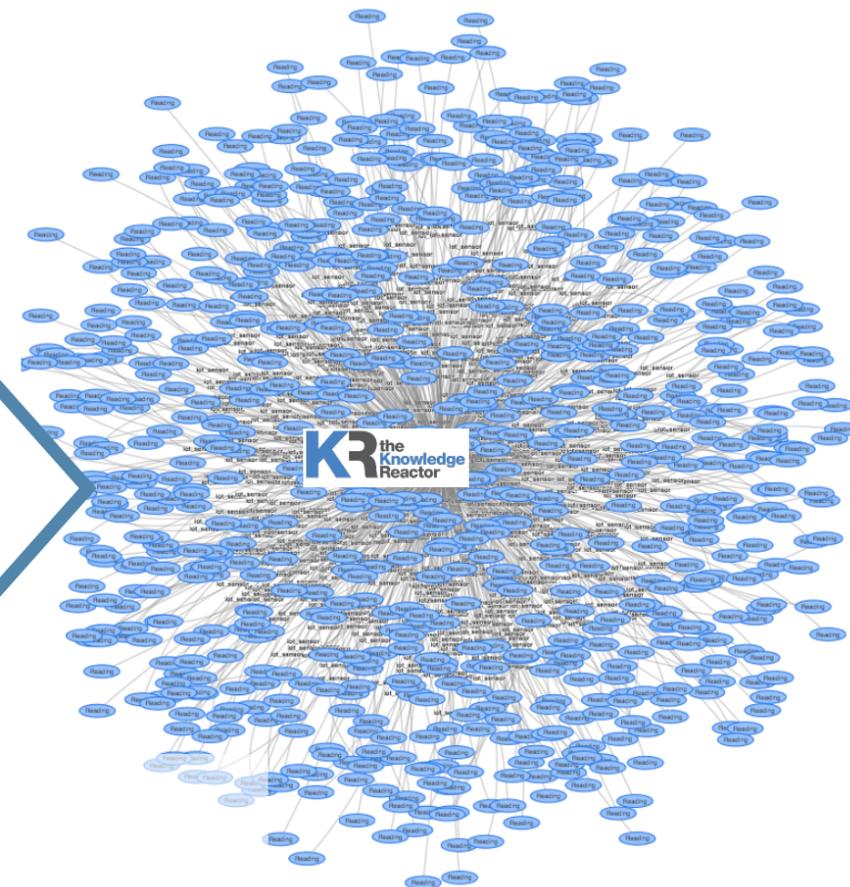


- Complexity in integrating existing home IoT and eldercare solutions
- Floods of alerts caused by the lack of contextual insights from sensor data
- The requirement for personalization

Cognitive IoT Based Aging Solution Pilot: *Context + Cognitive*



3 months of sensor data



48 sensors installed in a living unit of 87 yr old female

Cognitive Data Fusion Engine

Visualization of daily activities and anomaly detection

Cognitive IoT Client Case -- Avamere



Reduce hospital readmission

- Determine risk factors by modeling activity patterns from ambient and wearable sensors, combined with data analytics
- Correlate patient claims data, hospital readmission data, and activity patterns to yield new insights for risk mitigation

Cognitive IoT Client Client Case -- Sole



Optimize care & increase operation efficiency

- Understand elder behaviors through sensors and analytics to manage frailty
- Develop predictive models to help prevention and intervention of risks

Social Interactions Client Use Case – Japan Post



“ We are joining with two of the world's most respected leaders in technology to bring our elderly generation into the connected world ”

Taizo Nishimuro
CEO of Japan Post Group

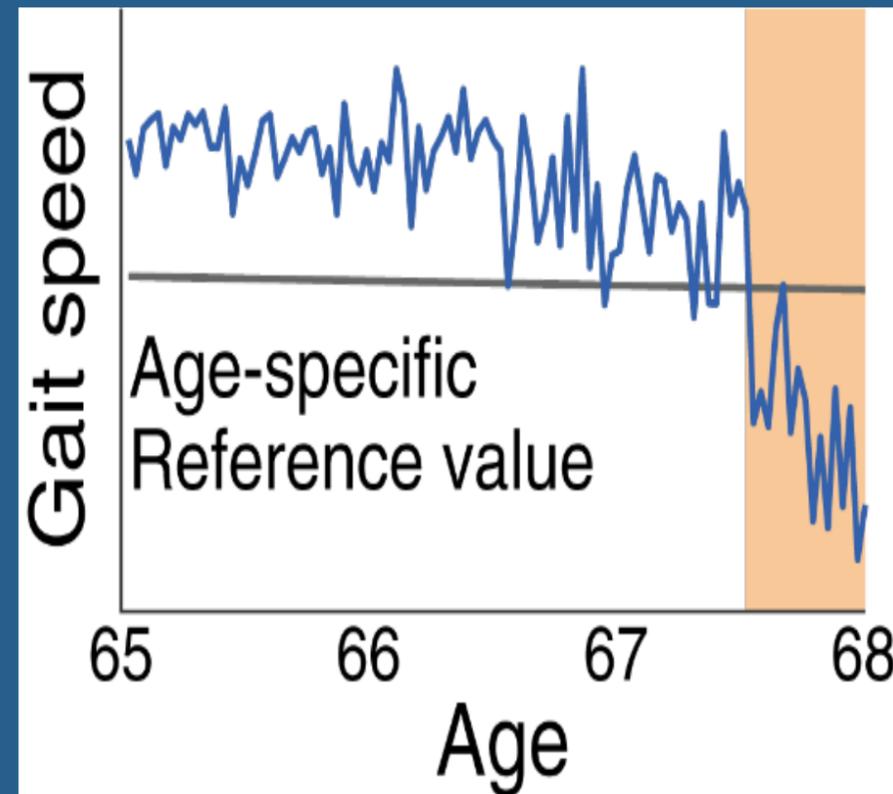
Improve engagements - Conversation as sensors

- Voice-base natural user interface for daily watch over
- Analyze life patterns, feelings, interests and issues from daily conversation (e.g. cognitive decline detection)
 - Share information with families and care giver
 - Provide support that can keep the elderly self-sufficient

Gait Analysis – Fall and Cognitive Wellness

Feature extraction of gait

- Gait speed & its variability
- Step frequency
- Stride time variability
- Step-length & its variability
- Foot swing velocity
- Stance and stride time



Detection

- Motor function
 - Fall risks
- Cognitive decline
 - Episodic memory
 - Executive function
- Diseases
 - Parkinson disease
 - MCI
 - Alzheimer's disease



IBM Research:

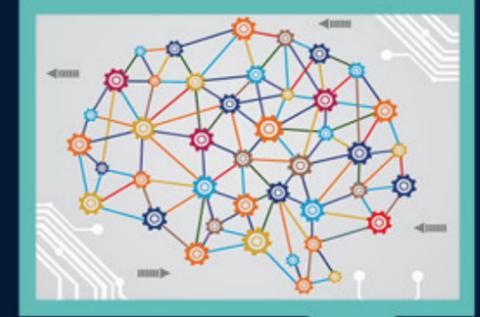
Invent and innovate future technology

IBM Research: Unmatched Talent

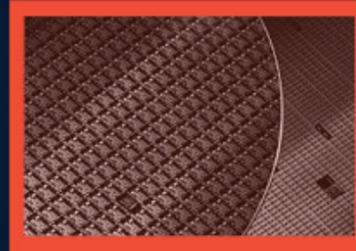
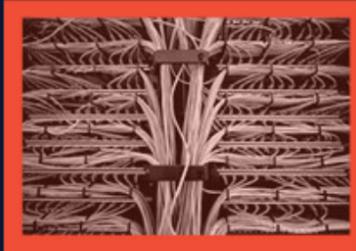
3000 Researchers



A New Era of Computing



Cognitive Systems Era



Programmable Systems Era



Tabulating Systems Era

The Promise of the Future



Blockchain



Neuromorphic Computing



Cognitive Computing



Quantum Computing

Thank you!

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ibm.com/able/aging