

Delivering Dignity with Technology

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What is DIGNITY?

Probably, the title of this presentation is not quite correct.

DIGNITY ≠ ABSENCE of INDIGNITY

Indignity (definitions)

Humiliating, degrading, or abusive treatment.

Injury to one's self-esteem or dignity.

An **indignity** is usually something that happens *to us rather than something we do ourselves*.

INDIGNITY

Can stem from the PRESENCE or ABSENCE of other people.

Can be lessened with people CLOSE to us?

Can be lessened with STRANGERS?

Is relative to those we view as our tribe/peers – people who we place in a position to judge us. The group that confers status to us.

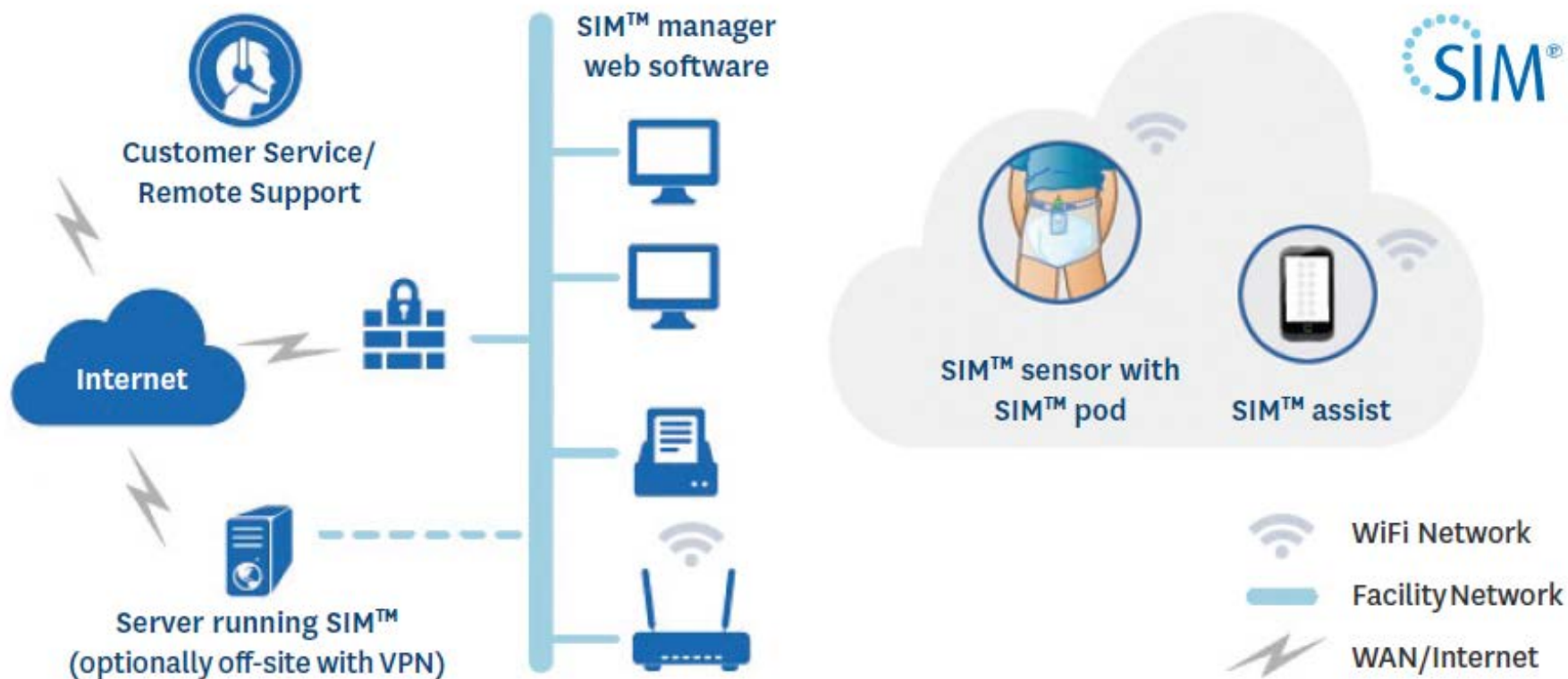
Suffering an indignity at the hands of one group/person can be dignified in the eyes of another group/person e.g. camaraderie in PoW camps.

INDIGNITIES in Aged/Palliative Care

- ❖ Loss of independence
- ❖ Incontinence
- ❖ Being without visitors
- ❖ Asking for help/not being able to cope
- ❖ Loss of capacity
- ❖ Loss of memory
- ❖ Being unable to make oneself understood
- ❖ Moving slowly
- ❖ Not being able to hear/see very well
- ❖ Having to give up work/home/identity

Simavita (licencee to 2 CSIRO patents)

Sensors enabling the accurate and discreet management of incontinence



The 'Silver' market

People don't like to be reminded that they are old.

With BABY BOOMERS entering into retirement, expect many more products targeted to these cashed-up consumers.

The 'elder' market will change – more aspirational, premium, elegant designs – marketing will avoid reference to declining capacity, rather focus on enhancing capacity via products.

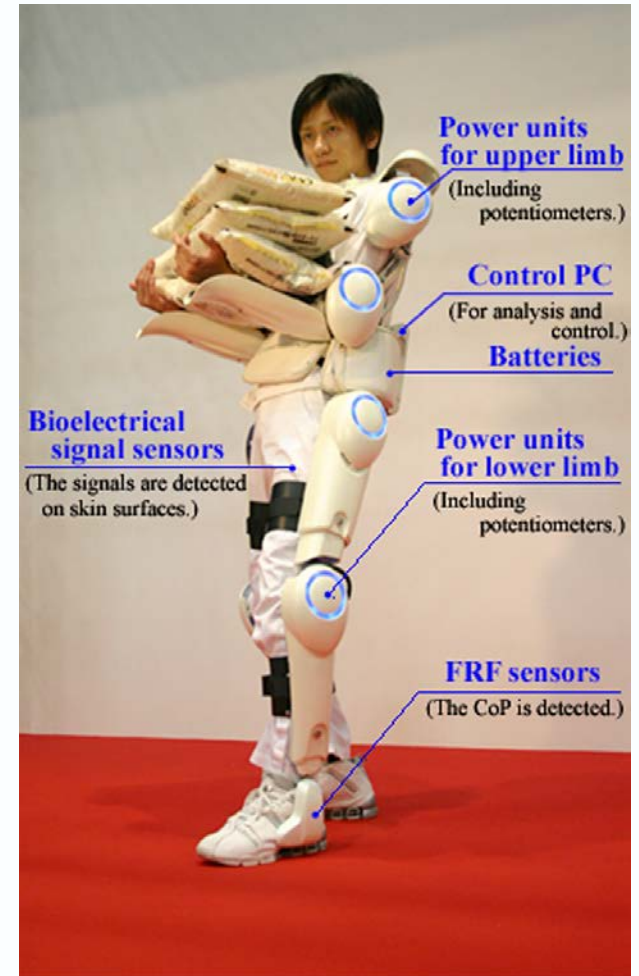
More elegant & flattering clothing/underwear/medical products.

Japanese malls specifically for elderly – co-located with medical centres. The 'grey yen' attractive as older Japanese outspend their younger counterparts. Panasonic – lighter weight vacuum cleaners.

Powered exoskeletons



For example: cyberdyne.jp



Bionic Limbs

- Will augment
- Independence
- Help carers lift
- Japan
- Armed forces



Bebionic.com



Bebionic.com



Gizmodo.com

Hanover students: human cruise control

Electrodes (potentially built into your clothing), zaps your Sartorius muscle and thereby is able to steer your walking without your conscious control.

Potential for walking on auto-pilot.

Controlled by your Smartphone via Bluetooth.

Never get lost again – even if you can't remember where you're supposed to be going!



The Hug Shirt (cutecircuit.com)

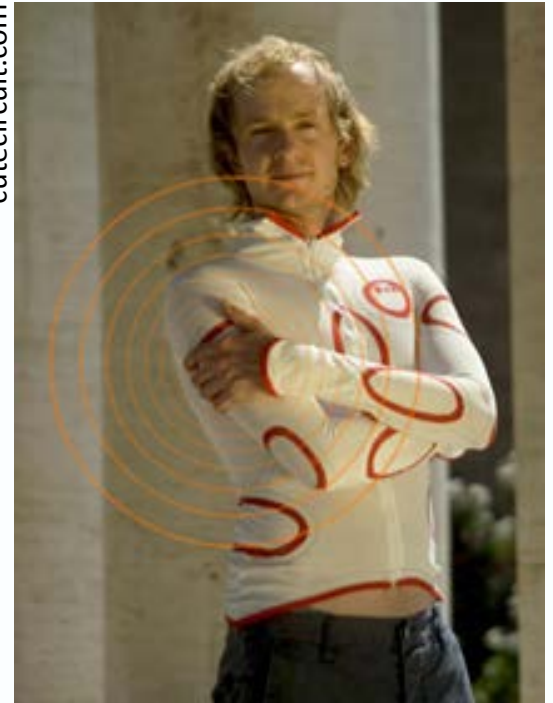
Wearable touch

The Hug Shirt™ is a shirt that makes people send hugs over distance!

The HugShirt was invented by Francesca Rosella and Ryan Genz the co-founders of CuteCircuit.

Embedded in the Hug Shirt™ there are sensors that feel the strength, duration, and location of the touch, the skin warmth and the heartbeat rate of the sender and actuators that recreate the sensation of touch, warmth and emotion of the hug to the Hug Shirt™ of the distant loved one.

cutecircuit.com



Emotiv

Consumer-level wireless EEG headset.

Applications in gaming and wellness.

Research:

- ❖ Reading facial expressions
- ❖ Performance & emotional metrics
- ❖ Mental commands

Active community of developers creating new apps e.g. post-stroke rehabilitation aid, fly a drone, control a computer mouse, meditation training.



emotiv.com



Saluda Medical

Implantable neuro-modulation (electrical stimulation).

Electrode array in spinal epidural space.

Uses (evoked potential) feedback loop controlled electrode arrays.

Intended to be more effective at reducing the artefacts caused by patient movement.

Small size simplifies surgery.

User controlled with wireless remote.

Spin off company from NICTA.

Received \$5M in funding from NSW Medical Device Fund.

Currently in clinical trials in USA



Self-driving vehicles

- Legal in California, Nevada, Florida, New York, North Dakota, DC
- Google, Apple, Benz, Tesla, Volvo
- Blind, disabled, under/over age, drunk?
- Self-scheduling?
- No need for ownership
- Premium – Tesla
- China – Youxia
- e-vehicle revolution





-  Motion sensor
-  Power meter
-  Temperature
-  Humidity
-  Accelerometer
-  Reed switch
-  Acoustic sensor

ACTIVITY



- HEALTH
- ACTIVITY
- SOCIAL
- CAMERA
- VIDEO CALL
- DIARY
- ALERTS
- SETTINGS
- ABOUT

WALKING

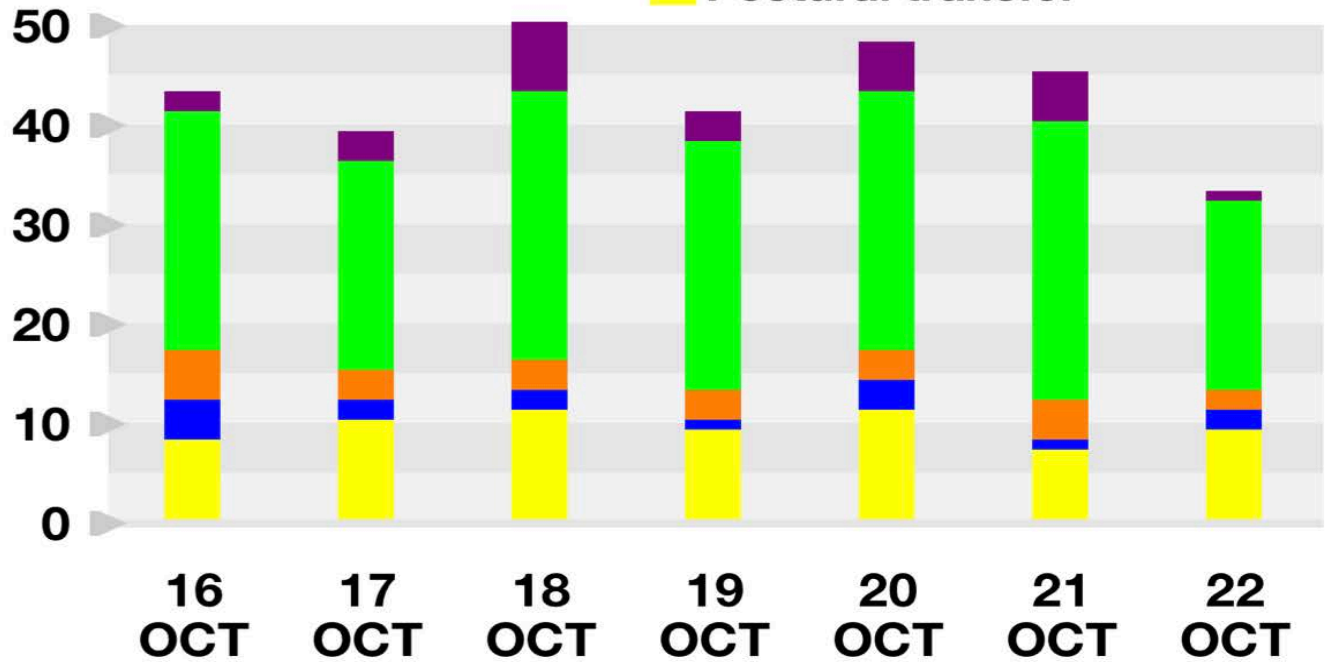


DAILY ACTIVITY



Score of Activities

- Dressing
- Meal
- Postural transfer
- Mobility
- Hygiene



PREV 7 DAYS

NEXT 7 DAYS

SSH Solution



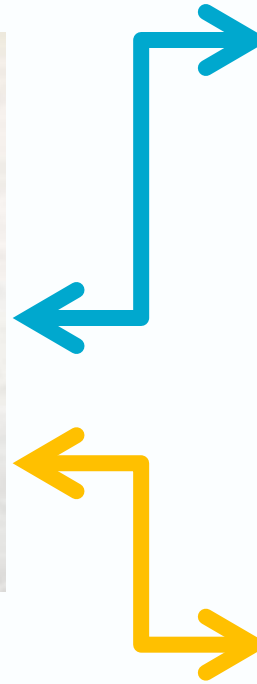
SSH Tablet App



Family/Relative Portal

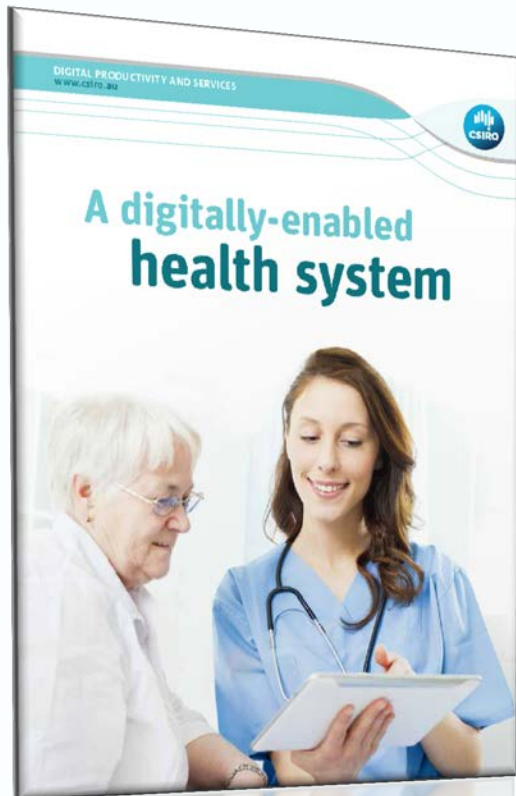


Clinical Portal



Further reading...

A Digitally-Enabled Health System



www.csiro.au/digitalhealth

What's Next?



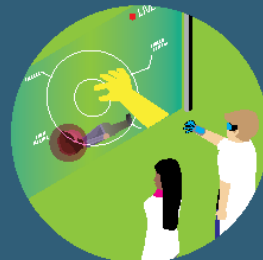
Monitoring and rehabilitation services at home



Patient admission and discharge forecasting improves bed usage.



Systems automatically pre-empt adverse drug reactions.



Remote guiding of health workers using telepresence



Patient-centric records that help health workers collaborate better



Mobile telepresence robots for remote ward rounds and training

Opportunities for Artificial Intelligence in palliative care

1. Guidance (Sean Morrison MD (2010) on palliative care)

- Patients & families do not have enough contact with MD (1MD/1300cases)
- Patients & families do not receive enough information – what to expect
- Patients & families do not receive enough emotional support

2. Companionship

- Nostalgia, immersive memories, digital inheritance, bereavement plans
- CALD (translation – e.g. Android Wear smartwatch)
- Gauges discomfort, anxiety, pain, distress, cognition, delirium
- Patient listener, reminder, coach, always there, fun, games, humour!
- Reduce feelings of being a burden to others

3. Complex care & navigation through the healthcare system

- Cases too complex, too multi-disciplinary, too time consuming to plan
- ACD's?
- Too off-line!

CURE

CARE

Final thoughts?

- ❖ There is tremendous opportunity to:
 - ❖ Improve quality of interactions
 - ❖ Reduce the drudgery
 - ❖ Produce sublime products that reduce indignity
 - ❖ Help people remain in control of their world longer
 - ❖ Reduce the healthcare cost explosion
 - ❖ Alleviate the looming pressures in workforce
 - ❖ Collaborate - researchers and users/practitioners

“Prediction is very difficult,
especially about the future”

Niels Bohr

Danish physicist (1885- 1962)

Thank you

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