ITU Workshop on
"E-health services in low-resource settings: Requirements and ITU role"

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Tele-care:
Role of Interactive TV in e-Health

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About A*STAR

Ministry of Trade and Industry (MTI)
Minister: Lim Hng Kiang

A*STAR

Economic
Development Board

Standards, Productivity
and Innovation Board

International
Enterprise
Singapore

Jurong Town
Corp

Sentosa
Development
Corp

Competition
Commission of
Singapore

Department
of Statistics

Energy Market
Authority

SERC

**Science and
Engineering
Research Council**

I²R, DSI, ICES,
IHPC, IME, IMRE,
SIMTECH
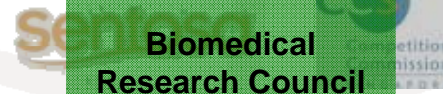
BMRC

**Biomedical
Research Council**

BII, BTI, GIS, IBN, I
MB, IMCB, SICS
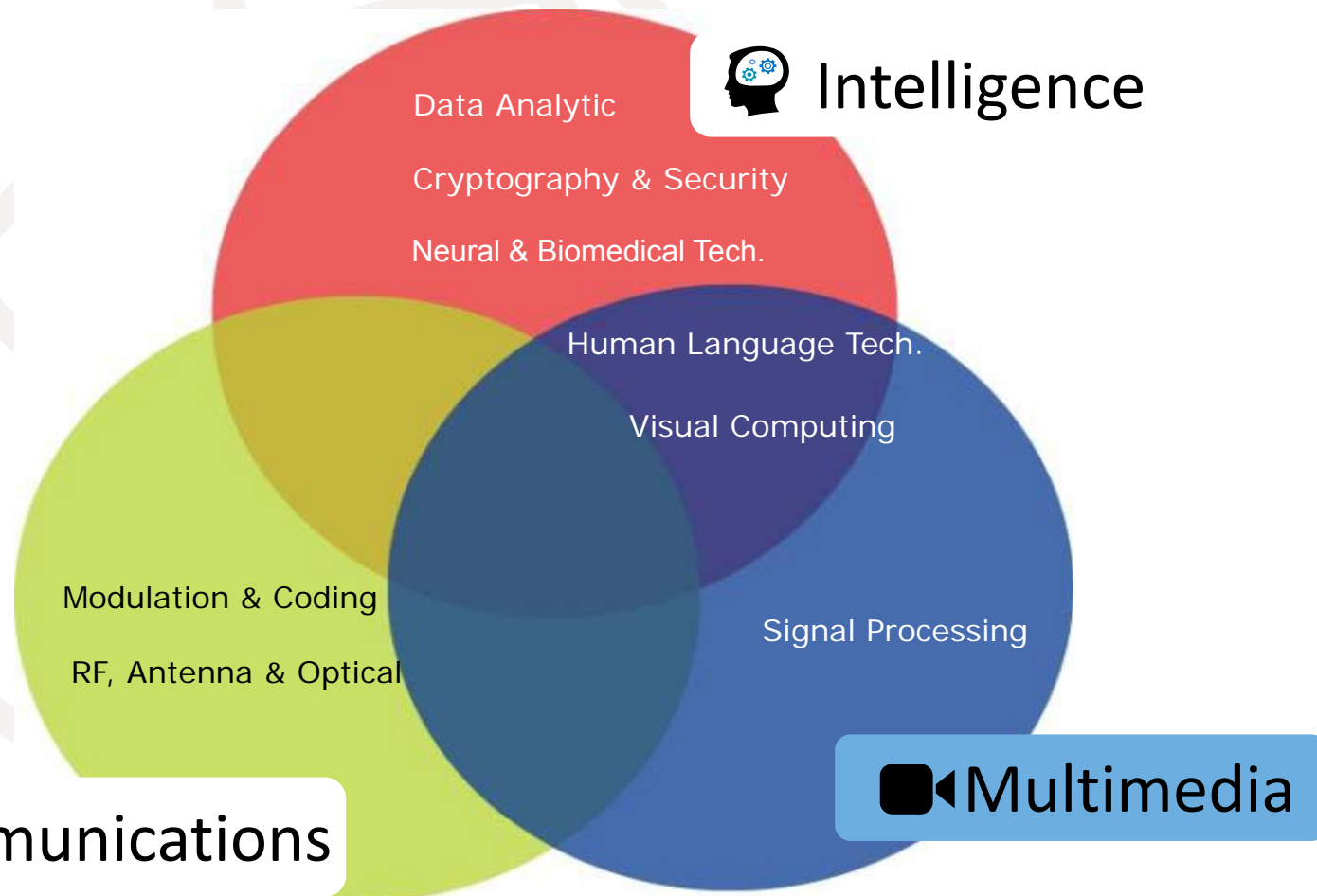
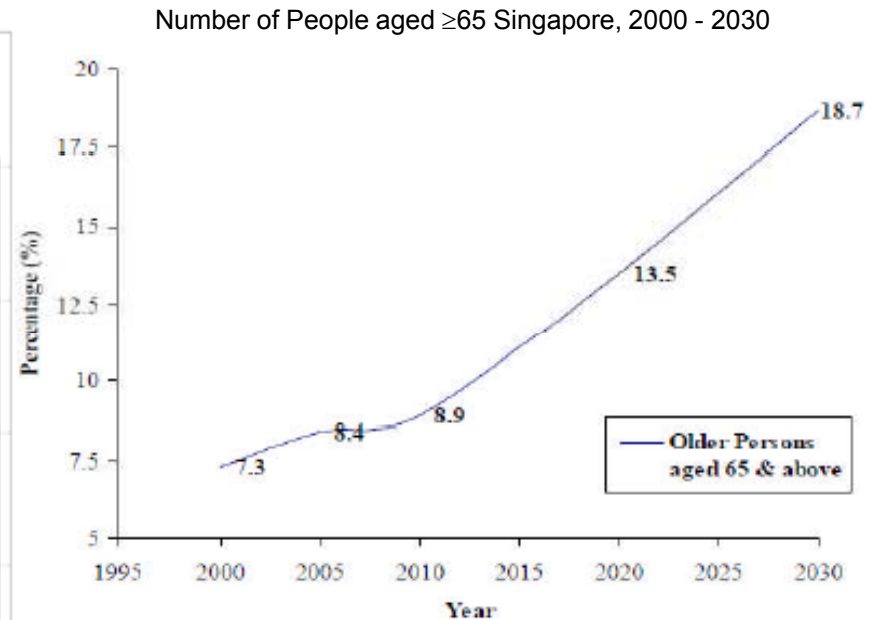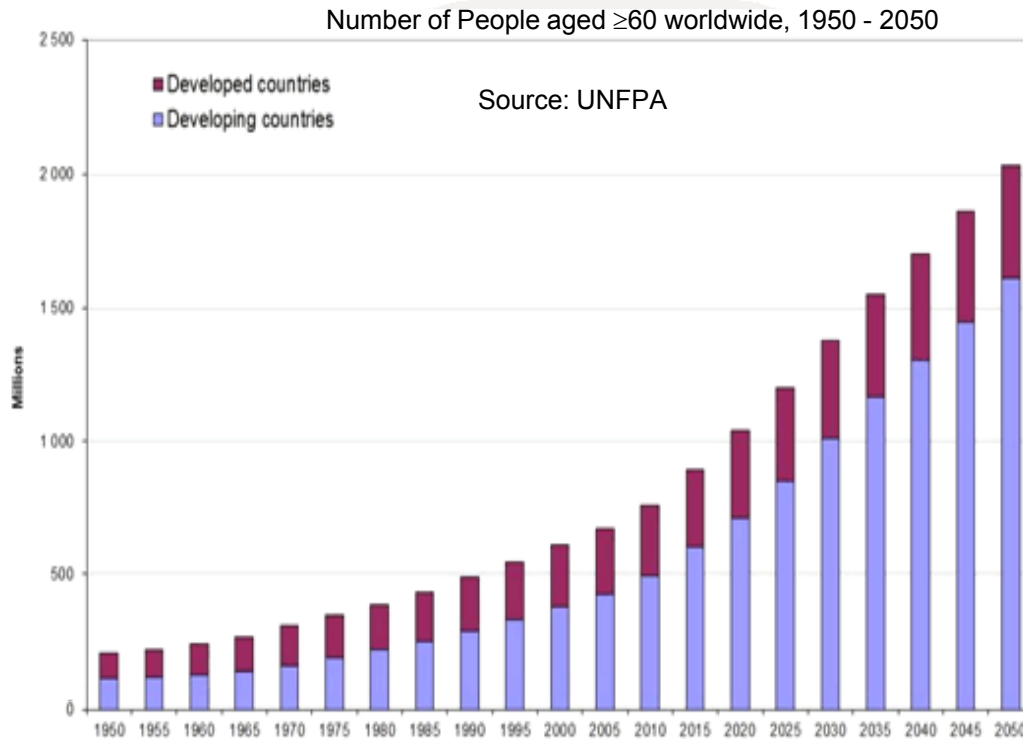Institute for Infocomm Research (I²R)

Areas of Focus

The Institute for Infocomm Research (I²R) is <u>Singapore's</u> largest ICT Research Institute. We are recognised as the nation's ICT R&D provider in the Infocomm and Media sector.

Data Analytic

Cryptography & Security

Neural & Biomedical Tech.

Intelligence

Human Language Tech.

Visual Computing

Modulation & Coding

RF, Antenna & Optical

Signal Processing

Communications

Multimedia

Ageing Population Trend

Number of People aged ≥60 worldwide, 1950 - 2050

Source: UNFPA

Number of People aged ≥65 Singapore, 2000 - 2030

Source: Ministry of Community Development Youth and Sports (2006). *Committee on Ageing Issues: Report on the Ageing Population*

- Singapore emphasizes the role of family in caring for elderly
- Home care:
  - Reduces the costs associated with hospital care
  - Enhances "Quality of Life"
  - Dimension of "good death" for patient

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Challenges Faced

Ideas sought to meet rising demand for eldercare services

THE authorities are discussing with home-care providers how to meet the growing demand for services among the elderly.

Some ideas include allowing experienced foreign health-care workers to stay longer, and Singaporeans with no experience to join the sector first and be trained later.

Demand is expected to soar as the population ages but the sector already faces a manpower crunch, said eldercare and maid agencies.

In response to queries, the Ministry of Community Development, Youth and Sports (MCYS) said it is working with stakeholders in areas such as how the employment of foreign workers in this sector can be classified and how long they can work.

Home-care providers said work permit holders in the services sector can work for up to four years and their permits can be renewed if they attend accredited courses.

Other ideas include lowering the foreign worker levy and raising the maximum number of foreign workers hired in relation to local staff, said NTUC Eldercare which provides day care, residential care and home-care services.

MCYS said it will be working with the Centre for Enabled Living to review the training of eldercare workers. The centre is an MCYS agency that coordinates social care for beneficiaries.

Expanding training is crucial for the lowering of entry barriers so more Singaporeans and foreigners can enter the sector, suggested Thye Hua Kwan divisional director S. Tiwari. Those without skills and experience, like housewives, can join first and be trained later, he added.

Currently, the elderly can tap home-care services which usually charge by the hour or hire a maid with some background in nursing – although such workers are few and their skill levels vary.

By 2020, about 600,000 people will be 65 and older. This is expected to rise to 900,000 by 2030.

Hence, the need to retain or attract more people to join the industry. By 2020, Singapore will need almost four times the number of people who now work in the eldercare sector, said Minister of State for Health Amy Khor earlier this year.

This means recruiting 11,000 more workers in all categories – from doctors and nurses to therapists and health-care attendants – over the next eight years. Today, this sector employs only about 4,000 people.

NTUC Eldercare, which gets requests for extended hours or overnight home-care services from one out of every five of its home-care clients, intends to bring in nursing aides and nurses from the Philippines soon.

Another service provider, Thye Hua Kwan Moral Charities, plans to use technology to plug the demand. Its services range from home care and day care to caregiver training.

It will pilot a new service in the next two months that allows, say, glucose and blood pressure levels to be monitored regularly in the day by doctors and nurses via teleconferencing. If a problem crops up, they will visit the client.

JANICE TAI

Straits Times 10 Sep 2012

By 2020, Singapore will have 600,000 people ≥ 65;
Need 4 times the number of people now working in eldercare sector.

Amy Khor, Minister of State, Ministry of Health and Ministry of Manpower

"When I was a medical student, I became very interested in why some groups of people were usually more sick than others, and it wasn't just about access to healthcare; it's also about how well people understand doctors' instructions and other health information, otherwise known as health literacy."

Dr Darren DeWalt, Associate Professor, Division of General Internal Medicine and Clinical Epidemiology, University of North Carolina, USA

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Why Tele-care?

Usage:

- Not every elderly knows how to use a PC or savvy with it, but everyone can and is willing to use a TV.
- Elderly stay at home >12 hours a day.
- TV is home's largest screen and is getting smarter. Smart-TV penetration to hit 70% of total TV shipments in 2016.

(IMS Research, 2012)

Time Spent:

Amount of time spent by average American watching TV

Group	Hours
Women >= 65	3.7
Men >= 65	4.7
Retirees	4.2
Average	2.7

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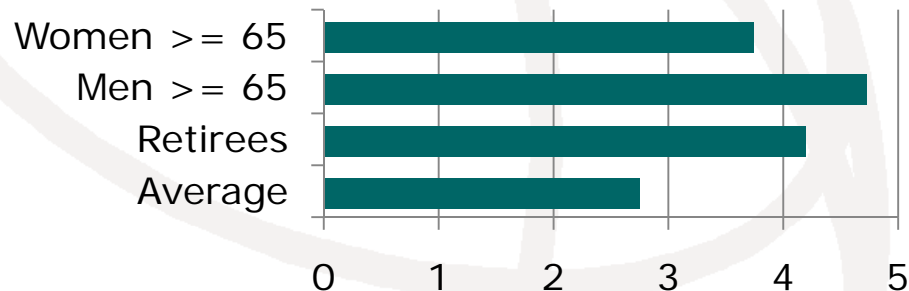
- Age 75 and older watch more TV than any other age group. (US News, July 2012)

Cost:

- Set-top box cheaper than PC/Notebook
- Easier to maintain

Interactive TV / Smart TV

✓ Have broadband access
✓ Able to do some amount of computation
✓ Able to run applications beyond decoding video
✓ Able to interface with other devices through wired/wireless means

Smart Utility Meter

Device Control

Traffic condition

Video games

Clinic queue status

Video-Wiki

Tele-health

**ITU-T H.721 (TD) &
ITU-T H.762 (LIME)**

Interactive TV: Smart Home Features

- Sample smart home developed:

  - **Smart Utility Meters**
    - Provides utility usage info (Real Time or Historical) on TV.

  - **Remote Devices Control**
    - Provides status of connected electrical devices.
    - Allows controlling of connected electrical devices.

  - **Fall Detection**
    - When a fall is detected, an alert is triggered on the TV.
    - Image of the scene that triggered the alert is displayed.
    - Recorded footage of the event is also available.

Smart Meters
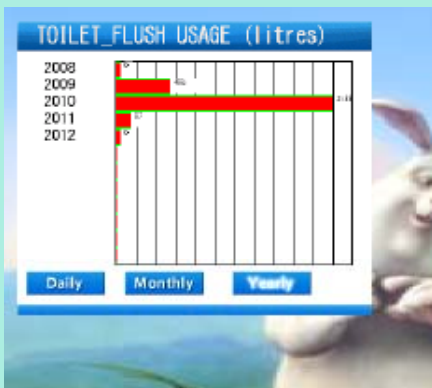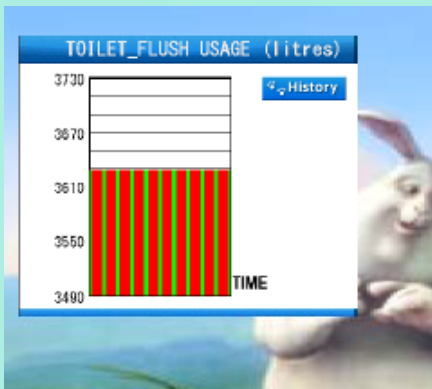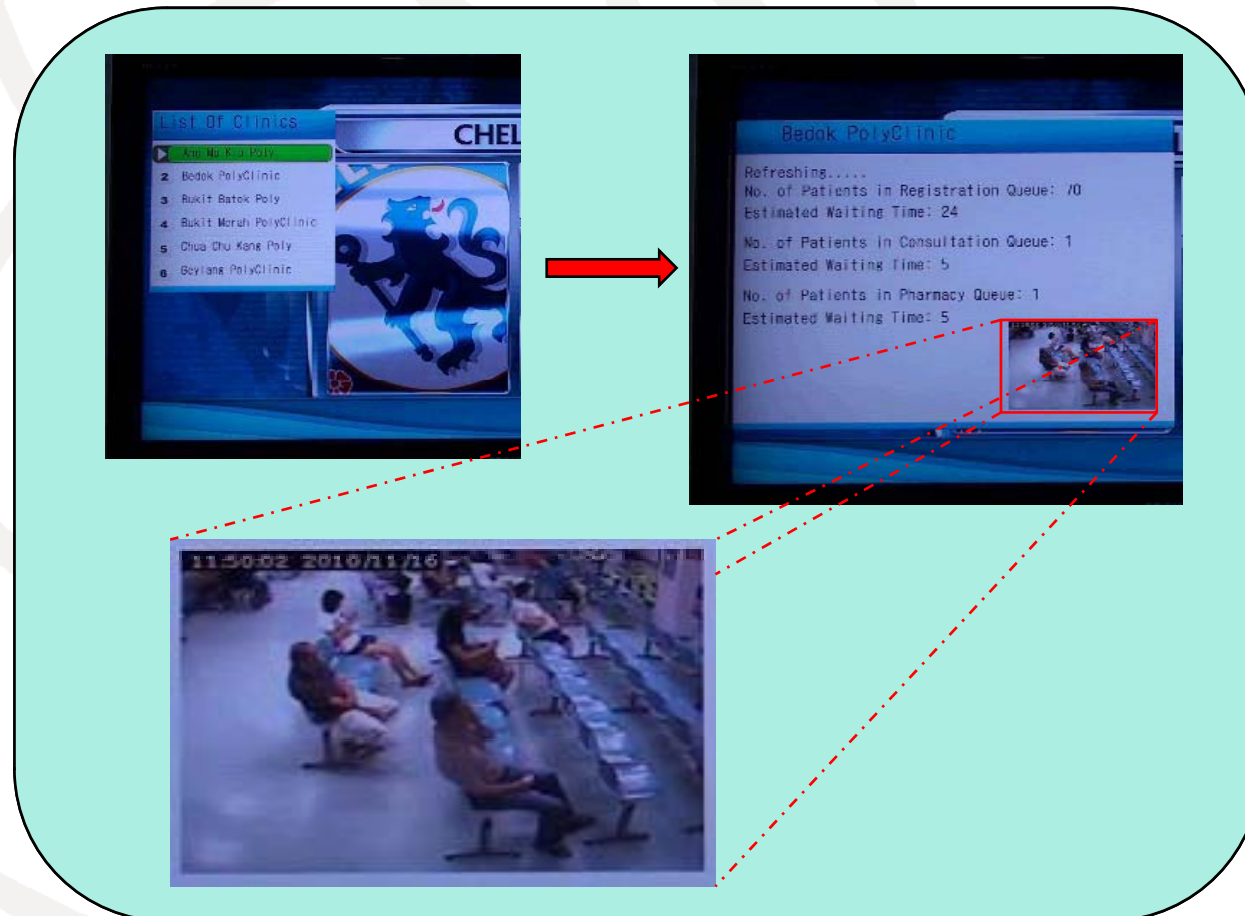

Remote Devices

Fall Detection
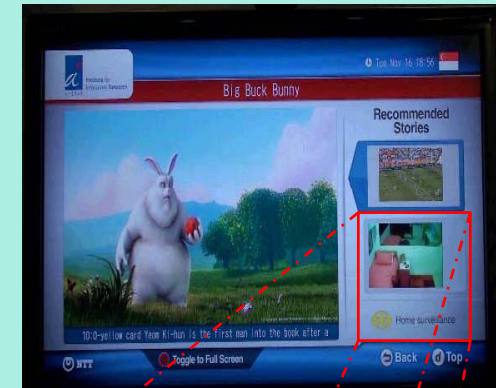
Tele-care: Consult A Doctor

- View live queue info from all polyclinics in Singapore.
  - Users can then decide when would be a good time to visit.
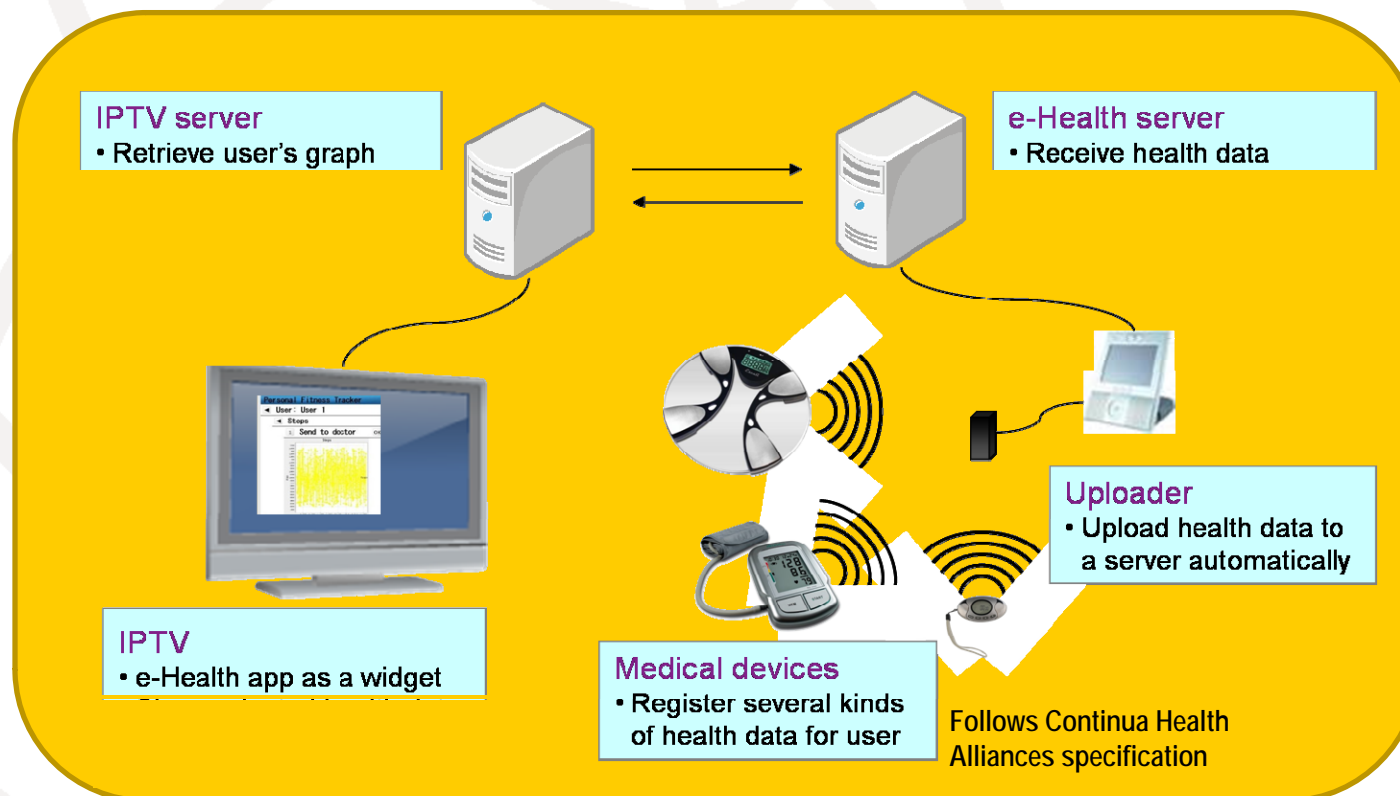- Provide number of people at registration, consultation & pharmacy counters

Tele-care: Consult A Doctor

- Allow users to view and change/delete their appointments.

- Updated appointments synchronized with user's account (e.g.: Google calendar).

- Reminder of upcoming appointment via TV alert or SMS.
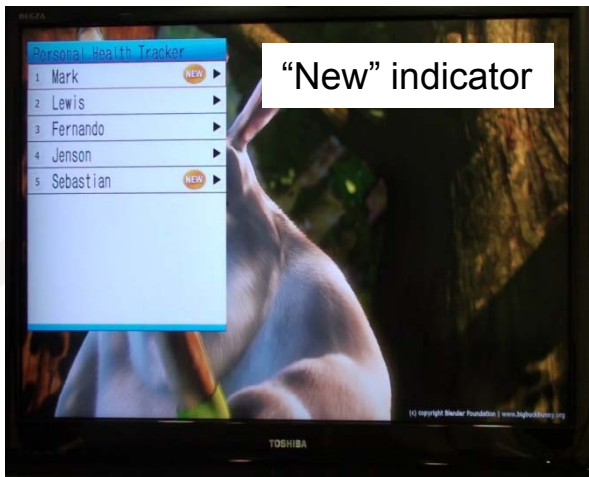

Alert on upcoming appointment
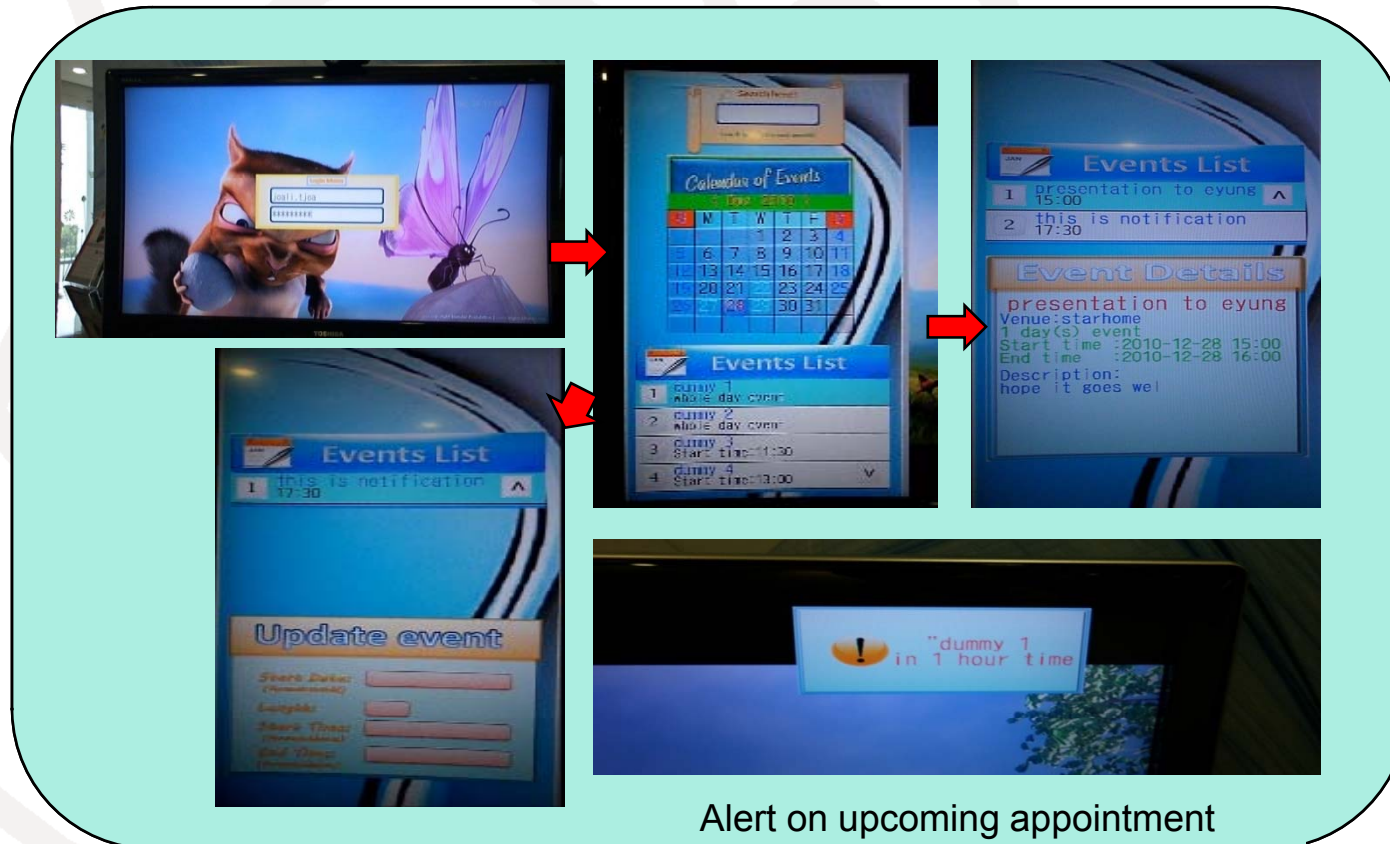
Tele-care: Vital Sign Monitoring

- Allow users to independently perform regular tracking or health statistics by themselves using TV.
  - Display health information from e-Health devices.
  - Send health information to a doctor directly from TV.

IPTV server
• Retrieve user's graph

e-Health server
• Receive health data

Uploader
• Upload health data to a server automatically

IPTV
• e-Health app as a widget

Medical devices
• Register several kinds of health data for user
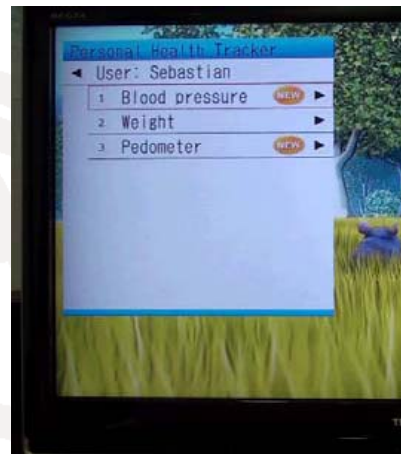
Follows Continua Health Alliances specification
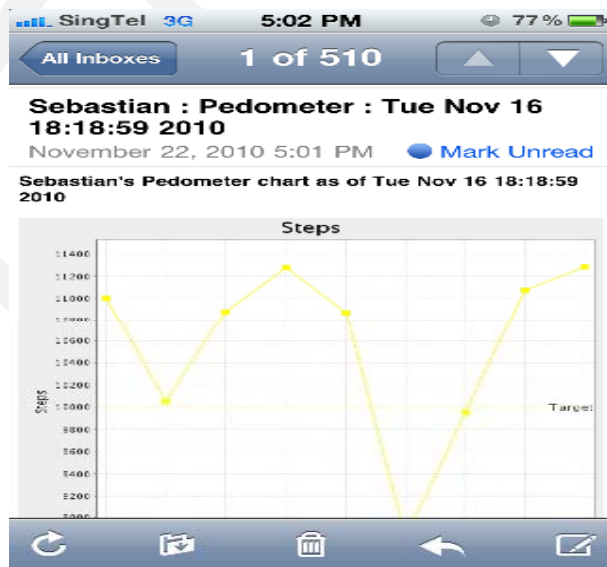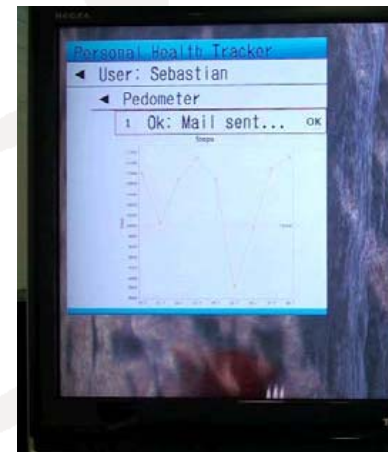
"New" indicator

Select user

Select vital info to see
(including past records)
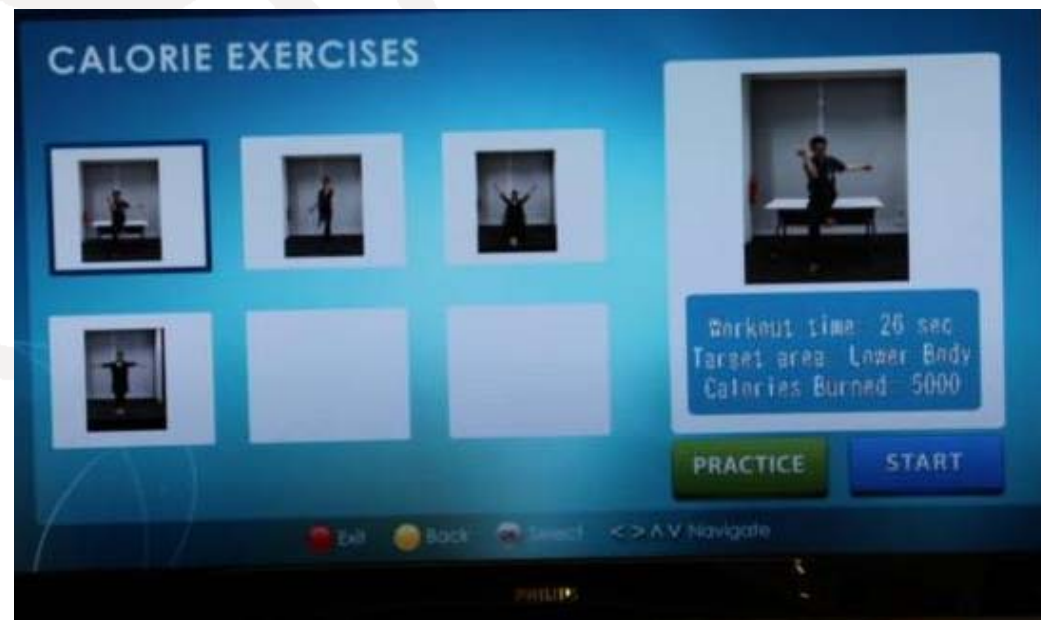
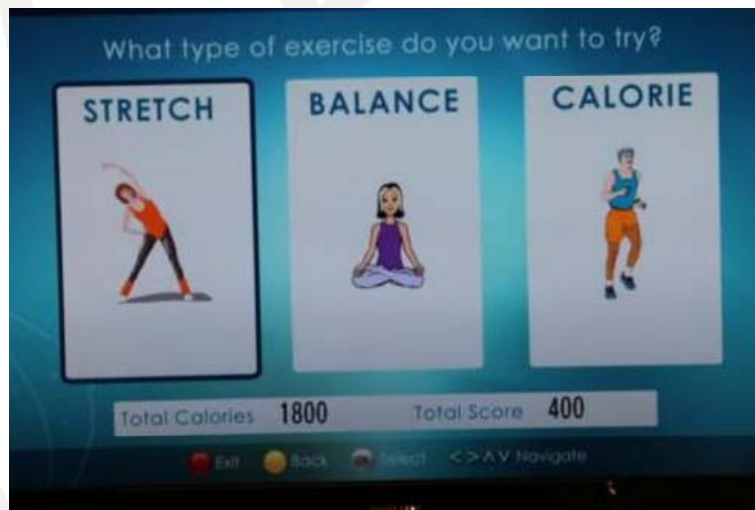Option to email
to doctor/caregiver

Info retrieved by doctor

Select doctor
(optional)

Tele-care: Exercise Monitor

- Encourages regular exercise to maintain healthy lifestyle.
- Teaches users through simple but enjoyable exercise videos.
- Exercise logged for tracking by self and care givers

Conclusions

- Interactive TV can be used as medium for tele-care
- Avoids the barrier of technology adoption
- Applications can be developed to support health condition monitoring & tracking both by individual and care providers
- Serves as medium to educate & promote healthy lifestyle
- Supports ageing-in-place, increases quality of life without significant increase in workers in the eldercare sector.

Thank you

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