NURSING HOME TAPS ON TECHNOLOGY TO RAISE PRODUCTIVITY AND PROVIDE HIGHER QUALITY CARE SERVICES

The National Productivity Council (NPC) Chairman, Deputy Prime Minister Tharman Shanmugaratnam, visited Ling Kwang Home for Senior Citizens today - one of the few nursing homes that uses technology in its day-to-day operations to raise productivity, and provide better quality care to its residents.

2. Established in 1983, Ling Kwang Home serves 350 elderly residents, majority of whom are wheelchair-bound or bedridden. These residents are prone to falls which may go unnoticed until the care staff perform their rounds.

3. In October 2014, the Home approached A*STAR to explore the use of assistive technologies to provide holistic and quality care to its residents, and improve their backend operations. Under the Technology Adoption Programme (TAP), Ling Kwang Home was linked up with suitable providers to develop technology solutions that can meet the Home’s needs.

Assistive innovations and RFID technology improve productivity and raise quality of healthcare service rendered to patients

4. The SoundEye monitoring device developed by A*STAR’s Institute of Infocomm Research (I²R) is a new innovation that is now being piloted in Ling Kwang Home. With the technology, care staff will be alerted of any fall incidents via an alarm sent to their mobile devices, and can attend to the injured residents quickly. It has raised the nurses’ productivity by around 30 per cent.

5. Another technology SmartMat provides the staff with real-time updates on the residents’ condition remotely at their desks or via their mobile devices. This is especially useful for monitoring chronically ill residents whose heart beat and respiratory rate could deteriorate drastically abruptly and require constant monitoring. SmartMat is a fibre optic mat that is able to detect a patient’s vital signs when placed on the beds of the residents.

6. The use of these innovative technologies has also enabled the staff to spend more quality time with residents, organise activities or perform other duties as they make less frequent rounds in the Home. This turn leads to better quality of healthcare service for its residents and improved productivity.

7. Ling Kwang Home will be exploring the use of RFID tagging system developed by A*STAR’s Singapore Institute of Manufacturing Technology (SIMTech) for their linen and residents’ clothings which helps to minimise the occurrence of lost laundry and also facilitate stock checking and counting. The tagging system is expected to be installed in 2016. The Home is already using clinical IT system for resident administration, clinical and nursing care, medication management to automate some of its processes.
Assistive technologies provide holistic and quality care for our seniors

8. At the visit, DPM Tharman said, “In every sector, we have to change traditional processes and find better and more innovative ways of doing things. Ling Kwang Home is a good example of how technology can also be deployed in high-touch sectors like nursing homes, to improve productivity and provide better quality care.”

9. Mr Dennis Tan, Chief Executive Officer of Ling Kwang Home, said, “Ling Kwang Home aims to provide our residents with skilled nursing care, and has taken steps to ensure that our environment is home-like, comfortable and secure. While our staff find their jobs meaningful, it is also important for us to constantly improve their working environment. A*STAR’s assistive technologies such as the SoundEye, SmartMat, and the RFID system will streamline the Home’s operations and bring productivity growth.”

10. Mr Lim Chuan Poh, Chairman of A*STAR, said, “A*STAR was privileged to work with Ling Kwang Home to pilot some of our assistive technologies for the healthcare sector. Together, we were able to demonstrate the benefits for residents and caregivers. We look forward to the full deployment of these technologies and to working with other healthcare providers to deliver quality care to our senior citizens.”

11. The visit is organised as part of the “Way to Go Singapore!” campaign, a national outreach effort under NPC to rally Singaporeans to embrace productivity. The visit seeks to facilitate sharing of knowledge and best practices amongst SMEs and across sectors.

Factsheet – A*STAR’s Technology Adoption Programme (TAP) and information on technologies adopted by Ling Kwang Home

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About Ling Kwang Home for Senior Citizens

The Home was established in 31 December 1983. An extended building was completed in November 1992 to cope with the demand for more bed space. It is a nursing home, which serves a maximum capacity of 350 elderly residents based on Christian values. Being a nursing home, the majority of residents are wheelchair bound or bed-ridden. We also have a Day Rehabilitative Centre serving the elderly living within the vicinity. Our non-emergency ambulances with hydraulic lift facilities are available to transport these elderly clients.

Besides providing them with physical care, we also believe in addressing the Pastoral/social and emotional needs to ensure that our elderly are receiving holistic care in all areas. Pastoral/social care counseling by experienced staff is provided to those who are in need. The elderly residents are encouraged to stay as healthy and active as possible.

About the Agency for Science, Technology and Research (A*STAR)

The Agency for Science, Technology and Research (A*STAR) is Singapore’s lead public sector agency that spearheads economic oriented research to advance scientific discovery and develop innovative technology. Through open innovation, we collaborate with our partners in both the public and private sectors to benefit society.

As a Science and Technology Organisation, A*STAR bridges the gap between academia and industry. Our research creates economic growth and jobs for Singapore, and enhances lives by contributing to societal benefits such as improving outcomes in healthcare, urban living, and sustainability.

We play a key role in nurturing and developing a diversity of talent and leaders in our Agency and Research Institutes, the wider research community and industry. A*STAR oversees 18 biomedical sciences and physical sciences and engineering research entities primarily located in Biopolis and Fusionopolis.

For more information on A*STAR, please visit www.a-star.edu.sg
FACT SHEET ON A*STAR’S TECHNOLOGY ADOPTION PROGRAMME (TAP) & TECHNOLOGIES ADOPTED BY LING KWANG HOME

TECHNOLOGY ADOPTION PROGRAMME

1. A*STAR is committed to helping SMEs enhance productivity; our Technology Adoption Programme (TAP) has seen over 1,350 technology adoptions to date, benefiting more than 950 companies and all adoptions achieving more than 20 per cent productivity improvement.

2. TAP is a $51 million programme launched in July 2013 to improve SMEs’ access to technology for productivity gains. TAP works with Research Institutes (RIs), Institutes of Higher Learning (IHLs) like the polytechnic and universities to develop technology solutions. Several Ready-to-Go (RTG) packages have been developed to meet SME needs.

3. Broadly, TAP does the following for companies:
   - Identify opportunities for productivity improvement;
   - Advise on the relevant technologies to help improve productivity;
   - Source for and match companies with the relevant technology solutions or technology providers;
   - Work with companies in the pilot technology implementation; and
   - Work with companies to measure productivity improvements.

4. TAP’s Technology Mapping Framework:

   - TAP’s intermediaries proactively engage SMEs through outreach activities such as seminars and focus group discussions. TAP has been working closely with the Trade Associations and Chambers (TACs) to understand industry's needs, trends and future requirements to propose new and interesting strategic developments of technology platforms.

   - These platforms are important so that the Government and SMEs can work together to make technology adoption more effective.

   - When there are no readily available solutions, we identify and translate novel technological packages, i.e. A*STAR goes beyond facilitating access to current RTG technological platforms to actively catalysing innovations.
TECHNOLOGIES ADOPTED/TO BE ADOPTED BY LING KWANG HOME

1. SoundEye (developed by Institute for Infocomm Research)

SoundEye is an emergency monitoring device using non-invasive technology to detect a person’s shout or scream. It is attached to the ceiling of residents’ rooms and alerts nurses at the earliest possible time when their charge has fallen down.

SoundEye does not require users to wear any device and does not employ any camera. It alerts the caregiver in fall incidents by sending an alarm to the caregiver’s mobile devices. This not only reduces time that nurses spend on their daily and nightly rounds around the Home but also enables them to attend to injured residents quickly. As a result of this technology adoption, the nurses’ productivity has improved by around 30 per cent and has freed them up to perform other duties.

Image 1: A SoundEye system installed on the ceiling or wall
2. **SmartMat (developed by Institute for Infocomm Research)**

SmartMat is a fibre optic mat that detects the patient’s heart rate and blood pressure. The mat can be placed under a mattress, unobtrusively monitoring a patient’s vital statistics and sending alerts to a web application, which nurses can monitor using mobile devices. Previously, nurses obtained vital readings of terminally-ill patients by manually placing the heart rate monitor near the residents’ bedside every two hours.

With this technology, nurses now obtain real-time updates on the patients’ condition remotely at their work desks, or while they are on-the-go.

![Image 2: A screenshot of the pulse and respiratory rate of an elderly using the SmartMat web application](Image)
3. RFID Tagging System (from Singapore Institute Of Manufacturing Technology)

With the radio frequency identification technology (RFID) tagging system, staff at the Home can track missing items like bedding, linen and clothing, which are currently identified and sorted out manually. Every item to be counted is attached with a RFID tag specially designed to withstand commercial laundry temperature and pressure conditions and pushed through a RFID tunnel that will scan the tags, count and display the quantity online. A RFID handheld reader can also be used to count loose laundry items.

With the system, the Home will be able to sort, track and count the laundry collected from the various wards faster and with greater accuracy. The staff’s working conditions will also improve as this system eliminates potential health risks that arise from manually sorting soiled linen.

*Image 3: RFID tag is attached to every item to be counted.*

*Image 4: A RFID handheld reader can be used to count soiled and clean linen.*