

Group ID: 10-31

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Future Trends Project Work Report

Step 1: Identify Challenges

Problem 1:

The future scene states that technology causes Mdm Lee to feel uncomfortable (fact). This could be problematic in 2030 because if this trend persists, the elderly will face a lot of inconvenience when technology in their homes is functioning not as accurately as they would have wanted (problem), resulting in the possibility that the elderly may get hurt when the technology is unable to help out, which may create certain problems instead (consequence).

Research:

Ian Hosking, an expert in design for the elderly at the University of Cambridge's engineering design centre, believes we need to get the basics right first.

"There are some very tech-savvy older people around, but there is clearly a large cohort of people who feel excluded by technology. They find it a bit impenetrable," he says.

Problem 2:

The future scene states that Mdm Lee is very used to being at home, and is lacking face-to-face conversations (fact). This could be problematic in 2030 because if this

trend continues, it will result in social segregation between the elderly generation and the populace (problem), leading potentially to health problems for the elderly like depression (consequence).

Research:

“A widely-reported 2006 study argued that since 1985 Americans have become more socially isolated....Sociologists Miller McPherson, Lynn Smith-Lovin and Matthew Brashears suggest that new technologies, such as the internet and mobile phone, may play a role in advancing this trend.”

This shows that technology does result in social segregation and combined with the advancement of technology in 2030 as seen in more realistic VR and AR by 2026, showing that if more realistic VR and AR can be achieved by 2026, it can eliminate the need for social interaction.

Problem 3 (Most Original):

The future scene states that the police, emergency services and the Senior Activity Centre Programme Director could enter her house without her permission (fact). This could be problematic in 2030 because if this trend continues, the elderly who install smart home systems at home are at risk of having their personal privacy undermined by the authorities (problem), which could result in the government having large amounts of personal data from the elderly (consequence).

Research:

This breaks the 1948 Universal Declaration of **Human Rights** where it states “No one shall be subjected to arbitrary interference with his **privacy**, family, home or correspondence, nor to attacks upon his honor and reputation.” The ability of the

government to barge in to the elderly's house without prior notice shows that the government is breaking the Universal declaration of Human Rights as the government can declare any moment an emergency and enter the house without both parties consenting.

Problem 4 (Most Researched):

The future scene states that Jason, Mdm Lee's son, spends a lot of money on Elderwatch, and tax rates were increasing as the workforce shrank due to the ageing population (fact). This could be problematic in 2030 because if this trend continues, middle-aged people like Jason faces great financial burden by being the breadwinners of the whole family (problem), which may result in a vicious cycle, and the defense of the country will also be affected (consequence).

Research:

"Who will man the Singapore Armed Forces and defend us?" PM Lee Hsien Loong, Speaking at the seventh annual Ho Rih Kwa lecture organised by the Singapore Management University, 1 Jul 2015.

"Those aged 40 to 59 reported the lowest levels of happiness and life satisfaction, while those aged 60-79 tended to be the happiest age group. Even pensioners aged over 90 are happier than those in their middle ages, the report found."

"According to research conducted by the Pew Research Center, early half (47 percent) of adults in their 40s and 50s have a parent age 65 or older and are either raising a young child or financially supporting a grown child (age 18 or older). About one in seven middle-aged adults is providing financial support to both an aging parent and a child."

"The 2014 Genworth Cost of Care Survey notes that the yearly average cost for assisted living in the U.S. is \$42,000 and nursing home care with a private room is \$87,600."

“According to the College Board, over four years it will cost \$129,700 for a student who entered a private college in 2013, and \$38,300 for an in-state resident at a public college or university.”

Problem 5:

The future scene states that Mdm Lee is unable to mop the floor by herself, and have to rely on technological gadgets (fact). This could be problematic in 2030 because if this trend persists, elderly will have a limited range of jobs that they are able to work in, which shows how the elderly is not contributing to the society as much as robots potentially will be (problem), resulting in potential health effects for the elderly when they feel helpless and useless (consequence).

Research:

There are too many products to help the elderly, this results the elderly, this results in the elderly feeling useless. This can result in depression. This is because when one feels useless, like he is not needed, he will face some health effects like depression. Some of the physical effects include erratic sleep habits, loss of appetite (or increased appetite with atypical depression), constant fatigue, muscle aches, headaches, and back pain. This means in the long term the elderly generation will be less healthy, both physically and mentally.

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Step 2: Select a Fundamental Problem

Fundamental Problem:

Given that Singapore is becoming a more difficult place to for the elderly to live in due to technology resulting in the isolation among the elderly (Condition Phrase), how can we further mobilise the elderly in the society (Key Verb Phrase), so that the elderly in Singapore will feel less lonely and also keep up with the digital age (Purpose), in the year 2030 and beyond (Future Scene Parameters)?

Step 3: Produce Solution Ideas

Solution 1:

We, the Ministry of Social and Family Development (MSF), will work with the Ministry of Communications and Information (MCI) and Mediacorp to teach the elderly on how to use the Internet to learn the methods of using any specific device, and also by putting televised and physical advertisements around the country. This will ensure that the elderly are aware of how to make use of every device. This policy will be enforced in certain social media websites, televised and advertised island-wide, and will be tabled for Parliamentary discussion by 2035.

Research:

National University of Singapore sociologist Tan Ern Ser said the divide boils down to low or lack of literacy among some of the older folks. Compared to the young, they are more likely to be daunted by a steep learning curve, and fear of making mistakes, he said. He cautioned that the digital divide could contribute to a growing “sense of

alienation and helplessness” for some elderly, although they could still get by with their daily lives without much fuss.

According to a 2014 study by US-based Pew research. Only 18 percent of seniors surveyed said they would feel comfortable learning to use a smartphone or tablet on their own and 77 percent of seniors said they would want someone to help teach them about the device. This shows that there is a need for people to teach the elderly on how to operate devices. In fact, some have already realized this need and started a business in it.

Solution 2 (Most Researched):

We, the Ministry of Social and Family Development, will work with the various town councils around Singapore and the Ministry of National Development (MND) to convince the elderly to split into groups and go to one of their houses, to play console or computer games. This will ensure that the elderly will be able to maintain their mental health, and communicate with other people more often, spending less time in isolation at home. This policy will be enforced island-wide, and will be tabled for Parliamentary discussion by 2032.

Research:

Because the elderly talk to each other less often, we need a way to motivate other people to talk to the elderly more. Other people in this context means anyone, ranging from relatives to friends, maybe even strangers. Motivation can come in many forms, with one of it to gather other elderly around to talk to each other. However the problem with this is that already some communities are doing but to limited effect. This is because it is costly to rent out an area for the elderly to use. Furthermore, the gathering of ingredients and the planning of activities require a lot of manpower. This is why we propose for the elderly to split into small groups and have one of the elderly host everyone else to go to his or her house to play console/PC games. It is seen that

playing certain types of games can help with the elderly's mental health. The games they play should contain a certain type of puzzle or teamwork element in it to keep the elderly's mind fit. One example would be Mario 64 which can be emulated on the PC or console, it contains many puzzles that the elderly can solve. This allows the elderly to communicate with other people more often, and spend less time in isolation from the community.

"3-D video games engage the hippocampus into creating a cognitive map, or a mental representation, of the virtual environment that the brain is exploring," said West. "Several studies suggest stimulation of the hippocampus increases both functional activity and gray matter within this region."

"Research in brain plasticity shows that the brain reorganizes resources to strengthen the fidelity of the learned stimulus or behavior, which is essentially a memory function that affects information processing efficiency. If there is considerable experience in engaging in a particular activity, the area of the brain associated with that activity shows enhanced function, whereas unspecialized stimulation reduces ability to discriminate and allows for overlapping response fields for multiple stimuli, producing negative plasticity effects. It has been suggested that the negative effects of plasticity explains cognitive decline in aging: insufficient attention, poorer sensory inputs, a higher noise to signal ratio, and poorer neuromodulation all lead to reduced discrimination and specialization of brain function."

"The extended practice approach uses the brain plasticity principles outlined here. The approach, by definition, involves hundreds to thousands of repetitions of the skill to be trained."

"Digital action games use general principles similar to those of extended practice training. Games involve continual repetition; they are designed to be played for many hours. For example, Medal of Honor published by Entertainment Arts in 2002, a game used in research on cognitive enhancement may involve approximately 10 hours of play to completion by an experienced gamer. Other games provide even longer basic play

experience. Starcraft published by Blizzard in 1998, for example, is designed for approximately 30 hours of play.”

Solution 3:

We, the Ministry of Social and Family Development, will work with the Ministry of National Development to carry out the programme of working with the various town councils around Singapore was to organise activities that are sports-related for the elderly to take part in. This will ensure that the elderly are able to maintain their health, reduce their time spent alone at home and increase face to face interaction. This programme will also help the elderly from increasing the risk of developing diseases/problems related to the lack of exercise. This policy will be enforced in various sports complexes island-wide, televised and advertised island-wide, and will be tabled for Parliamentary discussion by 2033.

Research:

The elderly should have at least 150 minutes of moderate aerobic activity such as cycling or walking every week, and strength exercises on two or more days a week that work all the major muscles (legs, hips, back, abdomen, chest, shoulders and arms)

Or

75 minutes of vigorous aerobic activity such as running or a game of singles tennis every week, and strength exercises on two or more days a week that work all the major muscles (legs, hips, back, abdomen, chest, shoulders and arms) According to NHS

Or

a mix of moderate and vigorous aerobic activity every week. For example, two 30-minute runs plus 30 minutes of brisk walking equates to 150 minutes of moderate

aerobic activity, and strength exercises on two or more days a week that work all the major muscles (legs, hips, back, abdomen, chest, shoulders and arms)

This proves the need for the council to advocate/try to get the elderly to exercise more as nine out of 10 senior citizens are hardy enough to live independently, according to a survey of 2,558 old folk in Marine Parade. But almost 400 of them show worrying signs of depression or dementia. A similar number also say they suffered a fall in the preceding 12 months. Worse, more than half of these folk aged 60 and older confess they do not exercise.

Solution 4 (Most Original):

We, the Ministry of Social and Family Development, will work with Housing Development Board (HDB) to encourage the sandwiching generations to stay together and take care of each other. This will ensure that the seniors help babysit the young children, while the kids keep their grandparents entertained by accompanying them, as a result, grandparents do not feel as much loneliness. This policy will be enforced island-wide, and will be tabled for Parliamentary discussion by 2032.

Research:

An empirical example would be one showcased in “Your Money: Creative caregiving solutions for the ‘sandwich generation’”, where Eileen Helmer, a 30 year old tax lawyer, lives with her grandmother of 90, also known as Eileen. Helmer says “I do all the grocery shopping, heavy lifting and changing the lightbulbs. She (Eileen the grandmother) takes care of all of my plants.” The sandwich generation, in this case Helmer’s mother and 3 aunts and uncles, are very satisfied that Helmer can both care and provide for her grandmother, and as Helmer puts it, “everyone says it’s a great relief.” This solution is relatively unique in the sense that it does not focus on the sandwich generation itself, but rather the cause for their stress, the sandwiching generation, and solves the problem from that perspective.

Solution 5:

We, the Ministry of Social and Family Development, will work with SkillsFuture to allow the elderly to continuously upgrade their skills and take tasks that require human interaction, which cannot be automated. This will ensure that the elderly will remain competitive in the job market even with the development of new technology, and also increase their face-to-face communication. This policy will be enforced island-wide, and will be tabled for Parliamentary discussion by 2031.

Research:

It is recommended that they are trained in jobs that definitely require human interaction and revolve around human interaction instead of memorization or other skills that degenerate with age. One such job would be working at a childcare centre as most of the time it would require talking to young children about day to day things, it does not require the elderly to memorize something to teach the children as they just can read out an excerpt from the elderly so on so forth.

Step 4: Select Criteria

Criteria:

Criterion #1: Which solution will be the fastest to implement for the Government of Singapore so that the problem of the elderly feeling too much loneliness will be resolved as soon as possible?

Criterion #2: Which solution will take the least resources to implement for the Government of Singapore so that the government will not have to spend too much money and manpower?

Criterion #3: Which solution will be the most sustainable for the elderly so that the solution will have long-term effects on them?

Step 5: Apply Criteria

Rankings:

Solution #	Time	Resources	Sustainability	Total
1	2	3	2	7
2	4	4	3	11
3	5	5	4	14

4	3	2	5	10
5	1	1	1	3

(1 for worst, 5 for best)

Step 6: Develop an Action Plan and Evaluate its Feasibility

We, the Ministry of Social and Family Development (MSF) will collaborate with the Ministry of Culture, Community and Youth (MCCY) to organise ElderSport. This will encourage the elderly to lead a healthy and active lifestyle, increase face to face interaction with one another and thus feel less lonely. This will be held in community centres all around Singapore and is planned to begin in 2030.

ElderSport is a sports tournament organised specially for the elderly and held at sports facilities in community centres all around Singapore. Only non-contact sports (e.g. tennis and badminton) and limited contact sports (e.g. football and basketball) will be included. Walking sports (e.g. walking football) will also be included. This is to suit the elderly as they are not as mobile as us youngsters, yet at the same time, keep them healthy and active. To encourage the elderly to participate, attractive prizes will be given to the top performers in each competition. This helps the elderly to bond with one another through sports and thus feel less lonely.

We, the Ministry of Social and Family Development (MSF) will also collaborate with the Ministry of Communications and Information (MCI) to develop an application called ElderMove. This will help the elderly keep track of their health and fitness, and at the same time, keep up with the digital age. This application is planned to be publicly released in 2030.

ElderMove is an application equipped with the latest Artificial Intelligence (AI) which analyses medical history, family history, and current health of the elderly. It then uses these data to predict what diseases the elderly might develop and recommend

suitable exercises to the elderly to prevent them from succumbing to the diseases. It also detects locations where other elderly could meet up to exercise together and provides subsidies to gym memberships for those who regularly use the app to exercise. In 2050, there will be an important update to the app which will allow the AI to know whether the elderly is in trouble or had an accident.

The fundamental problem seeks to make the elderly in Singapore feel less lonely and keep up with the digital age. The problem is that the elderly face isolation and possibly symptoms of isolation and also cannot keep up with the ever-developing digital age.

The isolation faced by the elderly is reduced when they use ElderMove as it has the function of allowing elderly to meet each other and this will allow the elderly to talk to other people which have the same experiences as them since they are from the same generation so on. This will allow them to easier to make friends with each other and reduce the isolation of elderly people who use this through communication.

The elderly can keep up with the digital age if they use ElderMove as they will use ElderMove at least once a week to keep healthy, since ElderMove sports the latest AI and design, the elderly will then become more used to the newest technology such as AI, holograms so on. Furthermore, seeing that how ElderMove is set on such a large scale and is supported by 2 ministries, the Ministry of Social and Family Development, and the Ministry of Health, companies will realize how big are the elderly in terms of the consumer base such that Ministry's need to cater to them, signifying how they are a significant part of the population, and can be cashed on by other companies. Other companies will then start to develop elderly friendly products. This process is sped on by the fact that since ElderMove is already elderly- friendly in essence, other companies will base their design of ElderMove, allowing production to be faster.

ElderMove may be opposed by the elderly. As said in the problems, as the elderly have a generation gap, the elderly is not used and suspicious of such technology or unclear of the benefits, might not want to use it. This may be due to the fact that the

elderly not being used to using technology when they were younger as it was limited back then, and thus as they grow older, they will have more trouble and take a longer time learning how to use ElderMove. They feel that it is not worth so much trouble to learn the skill of using ElderMove, considering they do not have much longer to live.

Hospitals, town councils, the Ministry of Communication and Information and the Ministry of Health are the assistors. Seeing that ElderMove will decrease the amount of elderly going to the hospital because they are more fit and have stronger immune systems and thus are less susceptible to diseases, and would also decrease the time which the elderly spend in hospital wards because of faster recovery if ElderMove was effective, they would want to support ElderMove probably in terms of benefits and monetary support so their hospitals would be less crowded, leading to less stress on staff and also less waiting time for patients as they would have lesser patients.

Another group which would want to support ElderMove would be the economists and the businessman. They would want a thriving workforce and little taxes to support economic growth. ElderMove allows more people back into the workforce as there are less people needed in hospitals as they are less crowded, there are also less people needed to keep watch of the elderly after 2050 because all they need is a phone kept by the elderly.

Another assistor would be those who run classes that the elderly are encouraged through the form of subsidies to join, such classes would be zumba, yoga so on. The ElderMove would sometimes give subsidies to the elderly encouraging them to join such classes, bringing profit for those running such classes.

Here is the timeline of the implementation of ElderMove. In 2020, app making competitions will begin, along with the signing of contracts with town councils to develop and install exercise corners for the elderly.

In 2025, the Ministry of Social and Family Development will work together with the Ministry of Health to strengthen cyber security on Medical Health records to prevent further data breach after the public release of ElderMove. Exercise sensors will also be installed to detect accidents at exercising areas.

In 2030, ElderMove will be released with AI for optimal exercise for the elderly.

In 2031, there will be a minor update to ElderMove, fitting it with better holograms to let the elderly know exactly which exercises to do and have specific records on the extent of effectiveness in their exercising scheme.

In 2045, there will be a test release for the new ElderMove, allowing the AI to automatically detect the accident and have the public respond.

In 2050, there will be an update of ElderMove to allow the AI to know whether the elderly is in trouble. Exercise monitoring sensors are no longer needed as the phone effectively does the job.

However, there are a few obstacles in this action plan too, which we have the solutions for. Firstly, because of a generation gap, the elderly, who are not used to and suspicious of such technology or unclear of the benefits, may not want to use ElderMove. We can work other companies to provide incentives for using Eldermove. For example, if an elderly actively uses the app for more than one week, then they shall be able to win a reward delivered to their house in the form of daily necessities such as pots, pans and toothpaste.

Secondly, the elderly need to be accompanied when exercising, which needs more people taken out of the workforce. From 2030 to 2050, we will install monitoring devices and limit the ElderMove to telling the elderly to only go to surveillance areas. From 2050 onwards, we will update the smart devices allowing them to have ElderMove capable to detect when an elderly is having an accident through sensors on the phone.

Finally, ElderMove constantly refers to medical record, if they were tampered, it can result in the deaths of the elderly. We will team up with the Ministry of Social and Family Development and the Ministry of Health to increase the cybersecurity in regards to medical records to prevent further hacks like the MoH medical record hacks.

The sports activities that the elderly will take part in will have a lot of limitations. For example, basketball and football will only be limited to that of walking and not

running. This is to ensure that the elderly will be kept in a safe environment without risks, and while they have limitations in their sports activities, they can exercise and get fitter and healthier at the same time.

The benefit of this to the future scenario is that it stated that there were too many people in the hospital, the elderwatch sensor was uncomfortable, the elderly were brittle, that they were uncomfortable to technology.

ElderMove helps decrease the number of people in the hospital and prevent it from becoming overcrowded by increasing the health of the elderly and has preventive measures in the form of exercise to decrease the chance of the elderly contracting and developing diseases so they will go to the hospital less, making the hospital less crowded. Because the elderly are healthier, if they develop a disease, their immune system is stronger and they are able to recover from it faster. It is also easier for the elderly to recover from accidents such as upper arm closed fracture so on, as their body is healthier so they will stay in hospitals for a shorter time so the hospitals is less crowded as each elderly stays there for a shorter time. So it helps with the “long queues...extremely limited bed space” mention in the scenario.

Going back to the future scenario, “...Device in the house, that it made her uncomfortable” this shows how the Elderwatch sensor was un-welcomed by the elderly. The ElderMove app can replace the Elderwatch sensor, since the phone is equipped with AI capable of automatically detecting an accident with a 3D sensor only available in the future. Compared to using the Elderwatch sensor, the Eldermove app is less intrusive for the elderly as they do not directly see the app monitoring them; moreover the sensor can monitor them as long as they have their phones with them. This is more efficient than setting up various stationary Elderwatch sensors around the elderly.

In the scenario it states the elderly are brittle as seen from “simple fall last month...leave her job”. After a barely serious fall, Mdm Lee has to quit her job, showing how brittle the elderly is to injury. ElderMove trains the elderly at a comfortable pace, so that they can be physically fitter as time passes. The elderly will therefore be less frail and will not sustain as much injury as compared to before Eldermove was implemented.

Had Mdm Lee been able to use Elderwatch to train her physical fitness, she would not have been injured to the extent of having to leave her job.

ElderMove also increases the elderly's effectiveness at navigating technology as they will be more accustomed to technology through their constant traversing of the app. Other companies will also find it easier to make products for elderly as they already have a base to start, which is the app interface.

ElderMove also helps reduce isolation and the onset of psychiatric problems in the elderly as the elderly. In the scenario it says that the elderly faced "degeneration of the mind and eventually dementia" when they were cooped at home. This shows that dementia and isolation of the elderly is a prominent problem in the scenario. Psychomotor skills helps delay the onset of psychiatric problems as we understand from an expert interview with Dr. Cai who works at Silver Cross Family Clinic. He said that there are reports suggesting that exercise does reduce the chance of developing mental illness such as dementia. This can be reduced through interaction with other elderly which is a feature of Eldermove; this can also be reduced through exercising, and Eldermove was designed exactly to help the elderly people in their exercise.

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