Fontys Paramedic University of Applied Sciences

Physiotherapy English Stream

Business Plan: TamaCare

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2. Introduction

a. Background:

The World Health Organization has defined that adults, aged 65 and older in the developed world countries, are considered to belong to the category of "elderly". (1) Worldwide, the population aged older than 65 is expected to increase at a high rate. This is particularly the case for the next ten years where it is predicted to grow much faster than the total population in all parts of the world. Globally, the figures from the United Nations' population division are estimated at 800 million of people aged over 60 (which represents 11% of the world population) in 2011 and are projected to rise to just over 2 billion in 2050 (22% of world population). (2) Furthermore, statistics have shown that about 25.2% of the population in Sweden, the target country of the product marketing, is aged over 60 years old making it the 7th biggest population over 60 years of age in the world. (3) Furthermore, Sweden also has the highest share of population over 80 years of age in the European Union with 5.1% in 2001.(4)

The increase in the aging population will almost certainly have, as a consequence, an increase of age-related disorders including both physical conditions as well as cognitive decline. A number of mental impairments exist among the elderly, as for instance Alzheimer's disease (AD), Vascular Dementia (VD), Mild Cognitive Impairment (MCI) or simply a natural decline in cognitive abilities.(5) Alzheimer Disease International (ADI) announced in their report in 2009 that there are 36 million people suffering from dementia worldwide, and estimated that those numbers would double every 20 years. This would mean that there will be approximately 66 million people suffering from Alzheimer's disease by 2030 and 115 million by 2050.(6)

Dementia and Alzheimer's disease are characterized by a progressive loss of memory and cognitive ability and are serious causes of mortality.(7) Elderly, suffering from such conditions, become more forgetful and confused, and daily tasks and activities become more complicated. Furthermore, many seniors that live at home and who are still independent for a great part of their activities of daily life (ADLs), suffer from mild cognitive decline. They forget to take their medications, to do their exercises, to go to appointments, to drink and eat regularly and gradually become more and more socially isolated. As a result, adherence to therapeutic interventions and medicine becomes difficult affecting the treatment offered by many health care professionals. Despite the vast amount of research as well as medical and technological advancements made, nonadherence among the elderly remains problematic.(8) It is therefore essential that research, entrepreneurs and medical professionals continue to investigate effective methods of increasing compliance to medicine and interventions within this age group.

b. Idea:

In order to increase the compliance of these seniors to a variety of treatments, a reminder device could potentially help seniors to get through the day. The basic idea of this project proposal is to create a fun and useful tool that assists elderly people to manage their ADLs and obligations with motivation. This TamaCare device would act as a reminder in several areas (such as a pill reminder, intake of fluids reminder or exercises reminder). There is similar products on the market, but this apparatus has the additional function of a virtual pet. It therefore motivates the patient to take care of a little creature by feeding it or exercising with it. The needs of the pet are transposed to the owner's own needs. In fact, research has shown that while taking care of a 'pet' or a doll, people remain more socially engaged, have less depression, suffer less loneliness and feel more secure. Furthermore they have more motivation for constructive use of time and require less medication that non-pet owners.(9,10) Although the pet is computer-generated, research has shown that owners develop affections towards digital animals to the point where they associate their virtual furry friend with real animals. (11)

c. Mission and Vision:

The mission for the team is to provide a useful and fun device for the ever-increasing elderly population with the hope of providing an easier and simpler lifestyle to seniors. It will also enable a more uniform and transparent cooperation between the multidisciplinary team that surrounds the senior. This multidisciplinary team does not only consist of the doctor, nurse and physiotherapist, but also the psychologist, the dietician and possible social workers that support the elderly person in their home environment. It will furthermore enable the personal care takers of the patient, such as family members or loved ones, to have better control over the care given to the patient as well as structured meetings with the health care team. As a result the TamaCare device will benefit not only the senior, but also his/her loved ones as well as the multidisciplinary medical team. The TamaCare for elderly is just the foundation of a product that the team is hoping to expand in the coming future by adding features to the tool itself as well as adapting the device to multiple target populations.

3. Market research:

a. Current Market:

As we are trying to bring a new product on the market, it is important to conduct a profound market research.

In fact, there is a huge market of assistive devices for the elderly population, such as mobility aids, devices that help them accomplish ADLs (getting dressed, getting up and down from a chair, toilet seats, reachers etc.), monitoring devices (e.g. Home blood pressure monitor) and reminders to counteract the decline in cognitive ability (automatic pill dispensers, calendars, electronic alarm systems etc.). Assistive aids can help improve health, quality of life and maintain independence in the home setting, as well as in the elderly home.

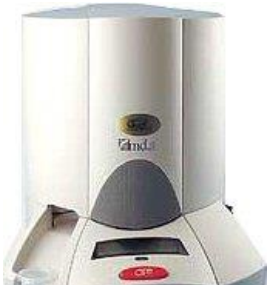


Image 1: Automatic pill dispenser

There are several products available on the market that act as reminders for the elderly population. One of the simpler and most common ones is the automatic pill dispenser, which is filled up by a care provider and/or family member and then sent to the company in order to program it. The senior will hear a sound as a reminder and has to push the red button. The dispenser will dispense the medication at the programmed time. The device is connected to the senior's telephone, so that in case he forgets a dose, he or a family member will receive a phone call. There are several brands producing such devices (Philips, TabSafe, etc.), but the main principle remains the same. This type of aid can be purchased independently and is used in many countries throughout the world. The device costs about 49$ a month (using the Philips Medication service) or up to around 800 $ one time purchase depending on the brand. (12,13)

Next to these simpler devices there has been a developing market for more high-tech solutions in the last few years. These include for example emergency and monitoring systems (personal emergency response system, QuietCare Plus, BeClose, E-Neighbour system), which track activity patterns of the seniors and give notifications to family members in case of unusual behaviour.

Furthermore, several devices have been developed to track people's activity, such as the Silmee W20 and W21. This device is a wristband which includes a skin temperature sensor, pulse monitor, ultraviolet light sensor, accelerometer and an emergency button in case of accidents or general distress. It enables health care providers to keep track of their elderly patients' movement without physically restricting their freedoms. This device is mainly sold in Japan. They cost between 200 $ and 234 $.(14)

Image 2: Toshiba Silmee W20

Image 3: The Grand Care system

There is also a variety of devices available on the market that assemble and help with multiple aspects of daily living, such as the Grand Care system and the Independa TV. They merge aspects of communication and socialization (video chats, calls, e-mail, text messages and calendar/appointments), medication reminders and entertainment (videos, family pictures, games).

The Grand Care system is even connected to sensors throughout the home that can detect motion, temperature, lighting, as well as monitoring devices such as blood pressure, glucometer and pulse devices. It will swing into action if there is activity outside the 'rules'. This can be as simple as a phone reminder to the elderly or phone calls/messages to caregivers or the emergency department in case of more serious situations. Both systems are meant to be stationary and cannot be carried around by the senior. The design of the Grand Care system is similar to a tablet, whereas the Independa TV system is a smart TV. The Grand Care system is currently available in the US, Australia, the UK, Canada, New Zealand, Bermuda and they plan to expand to Germany, France, the Netherlands and Finland in 2015. The Independa TV is mainly sold in the US. The downside of this type of devices is that they are very expensive (700-1600 $), not portable and can often not be afforded by the elderly population.(15,16)

Image 4: Independa TV

Image 5: Lively 24/7 Emergency Medical Alert System

Another smart aid for elderly people is the Lively 24/7 Emergency Medical Alert System. This product includes a smart watch and In-Home hub and activity sensors. The watch gives medication reminders, includes a step counter and a one-push help button. The activity sensors can be attached to the refrigerator and other kitchen objects to detect when food or drinks are consumed, as well as to the pill boxes to keep track when medications are taken. They can also be attached to doors (bathroom, front door etc.), to track daily routines in more detail. Just as for the high-tech devices mentioned above, care providers will receive alerts by email, text and app notifications in case of unusual behaviour of the senior. The company is planning to extend the device and add an auto fall detection as well as an option to pair it to a smartphone (which will enable

24/7 emergency response outside the home). It is sold in the US, the UK and Australia. The initial cost for the watch is 49,95 $, followed by a monthly service costs of about 35 $.(17)

b. Choice of Customer (customer analysis):

- Who are the customers?

  The focal customers that we at TamaCare aim to sell our product to are the elderly, particularly those who have a decline in their cognitive ability, but still are able to function for a great extent in their home environment. As the elderly population generally doesn't look for new products that they can benefit from, we will aim our advertisement to their children. As a result, the children (often aged 40+) greatly influence the purchases.

- What do the customers/clients do with the services?

  The product provides an easier lifestyle to the customer and acts as a reminder for ADL. The senior uses the product in a fun way – taking care of a little pet – which provides visual stimuli and motivation to adhere to medicine and therapies.

- Where do they get our services?

  Through social media, posters and flyers in different health clinics, and our website we will approach the children and they will introduce our products to their parents. As their kids know them well, they will approach them in a proper manner and the elderly are more likely to trust and listen to their children. Also, the team of health care professionals surrounding the senior, who usually plays a great role in the advising of the seniors, will be approached via medical conferences in Sweden and our website. Ultimately, the marketing approach will be via the health care system in Sweden.

- When do they buy our services?

  The client will buy the product situationally as they only require one product. However, there will be monthly services to the children and health care providers as, eventually, the team hopes to provide additional tracking services to those responsible for the health and well-being of the senior (further explained in the product section).

c. Choice of location:

The plan for our product is to start our sale on the private market. After we are established in this area, we will shift our focus to the state of Sweden. This way we can expand easily and in the long term our product will benefit from the Swedish health care system. Therefore, we have chosen Sweden as our country of choice to start our business in. There are several reasons for this:

- They have one of the world's highest percentages of elderly and it is increasing in a drastic manner.
- Their welfare system makes it easier to sell our product since the state will cover all the costs above 234 euro's if the product is needed by the user and approved by their government.
- The government is focused on decreasing the costs of their ever increasing population of elderly. This means that the state will take the necessary measures to keep the elderly safe in their own home and through this reduce the costs of beds in elderly homes and hospitals.
- If the TamaCare team gets an approval from Sweden they can easier take over the share of the market in all the Scandinavian countries, as they have very similar health care systems.

The population:

Sweden as a country has at this date a population of 9.878.00 in 2015 and it is estimated to increase to 12.903.000 in 2060. (4) In 2003 Sweden had the 7th highest population of inhabitants over 60 years of age. This number is expected to increase. Numbers from the national Swedish statistical agency show that the percentage of inhabitants over 65 years of age will increase from 19.7% in 2015 to 25% in 2060 (please refer to table 1). In addition, the population aged 80 years and older will increase with an estimation of 450.000 in 2015 to 960.000 in 2060, see image 6.

Table 1. Population aged 65 years and older in 2015 and forecast 2020-2060 according to alternative assumptions and discrepancy to the main alternative.(4)

Year	Population elderly	Percentage elderly of whole population
2015	1 949 000	19.7
2020	2 108 000	20
2030	2 432 000	21.3
2040	2 714 000	22.7
2050	2 891 000	23.3
2060	3 221 000	25

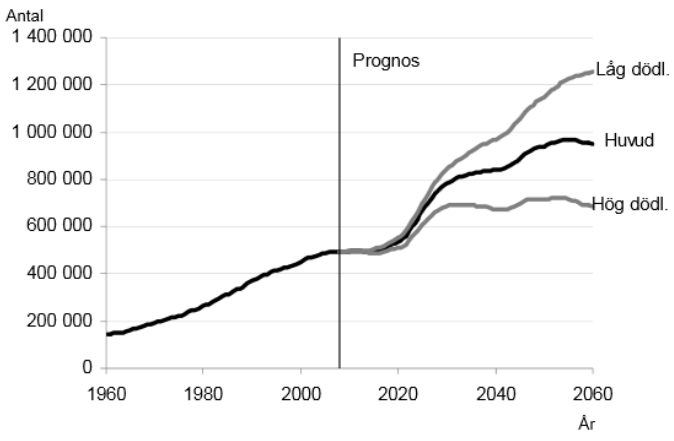


Image 6. Population of 80+ from 1960-2015 and forecast 2016-2060. Låg dödl. - Low mortality, Huvud - Main alternative and Hög dödl. - High mortality rates

The relevance of the division of the population in Sweden for the TamaCare care team is that with an increasing population of elderly, there will be more potential users.

Pension system in Sweden:

Sweden uses a system called the DC system for their pension. Nowadays they can retire when they reach an age of 65 years and the public pension spending is 8.2% of Sweden's Gross Domestic Product (GDP). There are three different levels of pension, see image 7:

Public pension: This pension is mandatory and everyone receives their share from the state. It is estimated by using calculations built on the 15 years of highest income of the individual's working career. There is also a 'guarantee pension' for the people with low levels of benefit from notional accounts. For a single person, the full guaranteed benefit in 2012 was SEK 93 720 (9958 euros) for a single pensioner born after 1938. There is also a housing benefit that covers 93% of housing costs up to a maximum of SEK 5 000 (534 euros) per month for a single pensioner. (18)

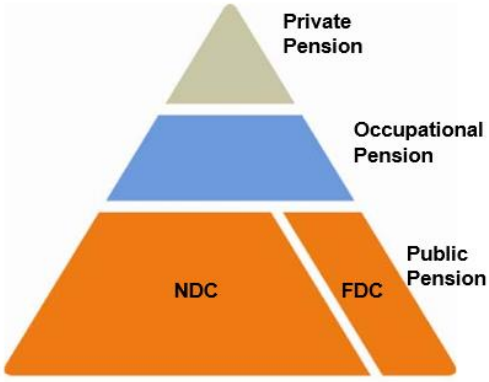


Image 7. The different levels of pension and the distribution between them.

Occupational pension: This is mandatory if there is a collective agreement. Over 90% of the population receive occupational pension on top of public pension.(19)

Private pension: This is voluntary and as the name suggests - private. People who want to save up for their pension can save money with these types of arrangements. About 50% of the population save in private pension.(19) To get a perspective of how much the 'guarantee pension' gives you we can present that the average worker earns SEK 387 300 (41.327 euros) a year.(18)

The relevance for TamaCare care team concerning the pension is that everyone will receive a pension from the state; this includes both the rich and the poor. Logically, this will give the team a larger population of elderly that can afford the product.

Health care:

The Swedish health care system is largely tax funded. This is a system that ensures everyone equal health care services. There is a high cost ceiling between SEK 900-1100 (96-117 euros) for medical consultations within 12 months. There is a similar maximal amount for medical expenses and medical aids at SEK 2200 (234 euros) in a 12 month span.(20) This means that the TamaCare product can maximally cost 234 euros for the user if the state of Sweden is to approve the device.

The elderly that lives in elderly homes are obliged to give their pension and the interests from their fortune to the state and will then get all their needs covered, free for charge.(20)

The relevance for the TamaCare team in this case is as follows: When the state pays for the costs above 234 euros the product will be more appealing for the user. This also gives the TamaCare team opportunities to increase the market price and push the revenue up. If the state approves the product there will be less of a need to focus on advertising of the product.

The future:

Sweden strives to decrease the costs of their ever increasing population of elderly. This mean that the state wants to help and use measures to keep the elderly safe in their own home and by this reducing the costs of beds in elderly homes and hospitals. Sweden had one of the fewest hospital spots per 1000 inhabitants in 2003 (37), see image 8. This number has decreased since they made a shift in the 1980's with focusing on elderly homes and helping the elderly to live at home for as long as possible, see image 9.(21) Sweden continues to push for this and with an increasing share of elderly it is more important than ever to find smart solutions for this challenge.

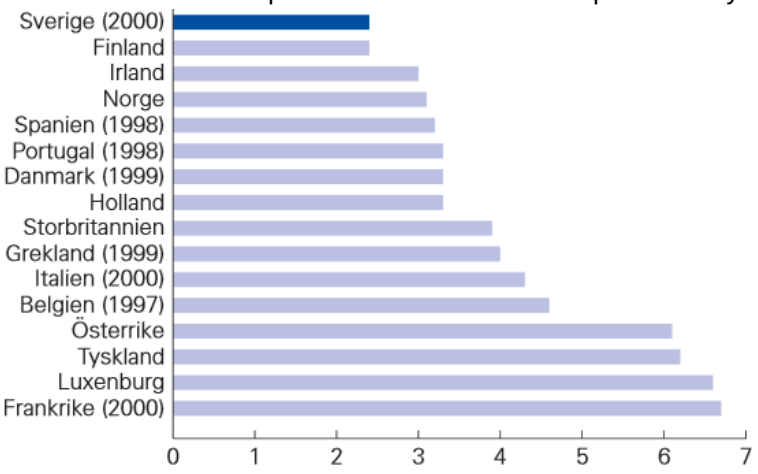


Image 8. Hospital spots per 1000 inhabitants in 2003 (5)

The relevance for TamaCare - This is the aim of the TamaCare device - to help the elderly live home for a longer period of time and to make life easier for the medical personnel in elderly homes. Since TamaCare can help to achieve one of Sweden's needs in the geriatric care it will be easier to get an approval from the state.

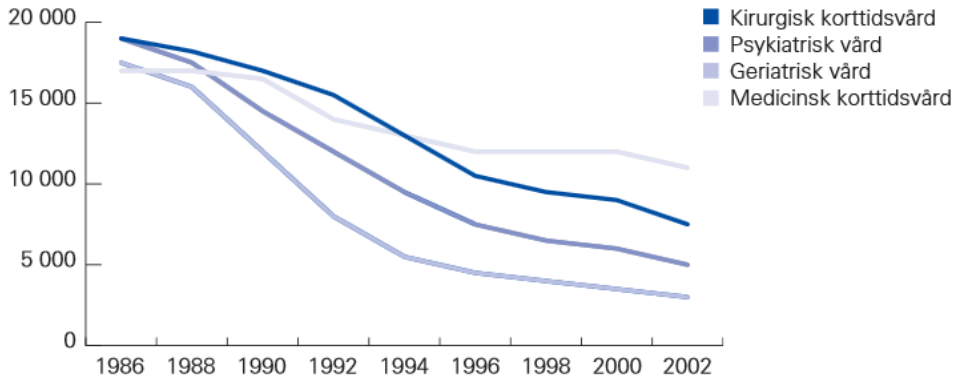


Image 9: You can see that 'geriatrisk värd' is decreasing. This is hospital beds for the elderly. (5)

4. Product:

a. Introduction

TamaCare (see Image 10) is a small, hand-held electronic device designed as a medical and social tool for the elderly population. As already mentioned earlier, the ageing process brings about an increase in many health conditions. One of the more important conditions that comes with age is a decline in cognitive ability.(22) Although it is not always diagnosed as a medical condition and is often purely a natural ageing experience, cognitive-aging can affect the daily lives of the elderly. It can also lead to a decrease in adherence with medication and therapeutic interventions.(23) The aim of the TamaCare device is to remind seniors on a regular basis of the most important activities of daily life (related to health and social aspects) in order to help increase the patient's compliance with medicine, dietary advice, exercise and social participation. Below is the outline of the main features of the device as well as the progress and milestones achieved.

Image 10: TamaCare device impression

b. Main menu

The main menu of the device contains the categories that the patient needs to be reminded of as well as the TamaCare pet (Please refer to image 11). The categories listed depend on the health care team and the conditions of the patient. A multidisciplinary team (such as doctor, physiotherapist, psychologist, dietician, social worker) program the software to fit the needs of each individual patient. The most important categories are mentioned in image 11. When it is time to eat or take medication, the TamaCare pet shows a notification in multiple ways (explained further below).

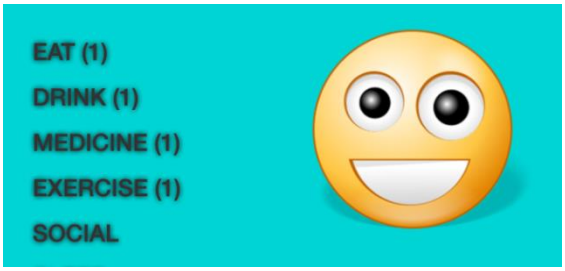


Image 11: Main menu of the TamaCare device, impression

The words written in the menu are as big and colour-contrasted as possible in order to trigger the different senses of the senior (vision, hearing and touch). Each category is also assigned a colour.

The first category is eat/food which reminds the owner of the TamaCare that it is time to eat and will give the senior suggestions of a healthy meal. A study has shown that aging elders who are housebound have a suboptimal status of essential trace elements, such as nitrogen and zinc, as compared to healthy controls.(24)

The second category, drink, is necessary as elderly people often show signs of dehydration when left to take care of themselves.(25) In this category a notification pops up reminding the owner to drink a glass of water or intake other fluid.

The third category is medication, which is essential for elderly, as many have health conditions requiring at least one medicine per day. Several studies shows that approximately 20% of those aged 65 and older take 10 medications and that adherence can be challenging.(23) It has also been shown in a previous study that medication reminder devices can improve medication adherence in the elderly patients with mild cognitive impairment.(26)

The next on the list is exercise, the category important to physiotherapists. Adherence to exercise is a challenge for physiotherapists with all age groups, but becomes especially problematic among the elderly.(27) The Centers for Disease Control and Prevention (CDC) advice those above 65 years old to do 150 minutes of moderate exercise per week. They also state that inactivity increases with age. About one in three men and one in two women over the age of 75 do not engage in physical activity. Furthermore, exercise helps reduce the risk for cardiovascular diseases, some types of cancer, type 2 diabetes and helps maintain the ability to live independently and reduce the risk of falling. Physical activity also has a positive effect on mood and depression and helps maintain healthy bones, muscles and joints.(28) The Tamacare reminds the owner to do short, regular activities to maintain general health as well as to comply with individualized tailored programs set up by their physiotherapist for specific conditions.

The final category is social/calendar which reminds the patient to engage in social participation, appointments and other important events. Studies have shown that reduced social contact, feelings of loneliness and social isolation are related with a reduced quality of life and have a detrimental effect on health and well-being. (29,30) Furthermore, it has been found that people with low engagement have a greater risk of incident cognitive decline and that isolation is related to increased mortality (31,32). This category is planned together with the patient, his/her personal carer, his/her family, and the health care professionals. A case study of a TamaCare owner has been prepared and can be found in appendix 1.

Design and progress: The menu was designed using a prototyping platform (Arduino) and using development boards and shields. The software is designed in a layered approach with a focus on maintainability to allow additional features and scheduling to be added easily. A protocol is defined to allow easy creation of schedules and programs. The current device is a proof of concept designed by the engineer, Michael Kruger. Minor redesign of the electronics, drawing and layout of the PCB (printed circuit board) and certification is required in order to commercialize the product.

Image 12: An option of a TamaCare pet which the owner can choose

c. Notifications and TamaCare pet

In order to remind the patient of the above mentioned activities, several notifications are built into the device. It is important for the designers of this tool to make it as practical and simple as possible

for the target population as with increasing age the senses, such as vision and hearing, become affected. The first notification is a loud noise for auditory information which is released by a built-in buzzer. Furthermore, an LED (light-emitting diode) light will light up in different colours for each category, along with a number appearing on the main menu for visual information (Image 13). In addition to this, the device will vibrate when a reminder goes off for tactile sensation. The device was not only designed as a therapeutic tool, but also contains an element of fun. When a notification pops up, the little TamaCare pet becomes sad. It is the duty of the owner or carer of the pet to click on the notification and do as it says in order to make the TamaCare pet happy again. This will give the owner the sense of responsibility and motivation to adhere to the interventions. The TamaCare pet will be individualized in order to assure a personal connection between the owner and the pet. The health care provider will have a file with different pets prior to installation of the program where the owner can select the pet of his/her choice. In fact, it has been shown that seniors caring for a pet or doll, remain engaged socially, suffer less loneliness, have more motivation for constructive use of time and require less medication than seniors who don't care for a pet or doll.(9) Image 12 shows an example of a TamaCare pet, both happy and sad.

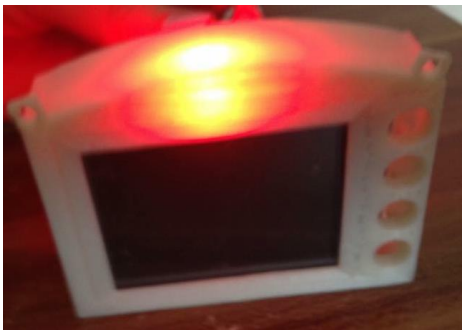


Image 13: LED light as notification

Design and Progress: The artist, Marcin Twardowski, designed the concept art for the prototype TamaCare dog while the assisting artist, Arlen van Rens, designed additional TamaCare pets. The electronics (built-in buzzer, LED light and buttons) were soldered to the proto-PCB by the electronic engineer.

Image 14: Prototype TamaCare pet

d. Design of the casing

The design of the casing has been chosen to be made as simple and user-friendly as possible. The casing is made of biodegradable plastic and will be white-coloured in order to allow the lightbulb to illuminate the cover. The device will have little loops at the top corners for the owner to hang it around his/her neck. Alternatively, the cover will have a hook/clip on the back for the owner to click it onto his/her belt. On the backside of the device a sticker will be attached with the emergency contact details of the healthcare team of the patient.

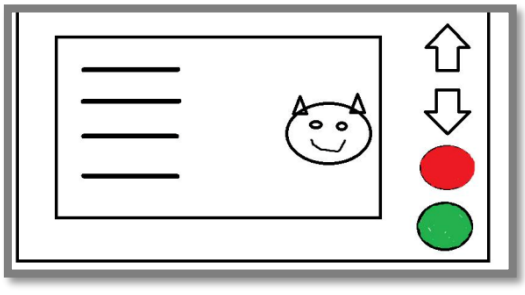


Image 15: Visual sketch of the buttons on the right side of the device

On the right side of the device will be 4 momentary push buttons designed for simplicity. These are as follow; a upwards arrow, a downwards arrow, a green button suggesting "yes" and a red button suggesting "no". Please refer to image 15 for a visual sketch of the buttons. This is a very important

characteristic, as elderly people are often unable to handle complex situations/devices. The detailed information about the parts and electronic components required to produce this device are mentioned within the estimated costs section.

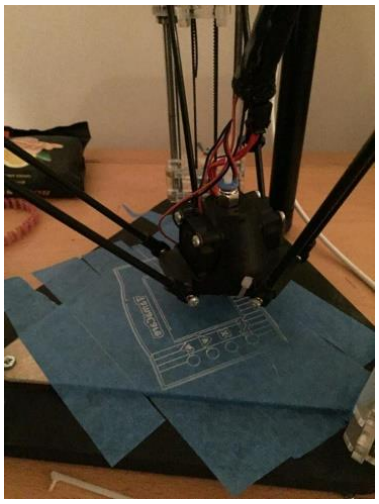


Image 16: 3D printing of the casing

Design and casing: The casing was designed using a CAD (computer aided design) programme. The result is STL files that describe the casing and can be used to physically manufacture the casing in small batches via 3D printing or milling (image …). Additionally the STL file can be used by mechanical engineers to produce molds. Molds are required to cheaply mass produce the casings via injection molding.

The casing consists of 3 parts. The front casing holds the LCD screen and LED light as well as cut-outs for the 4 buttons and for the lanyard for those who choose to carry the device around their neck. The back casing provides support for the buttons, battery and electronics as well as the buttons themselves (image 17).

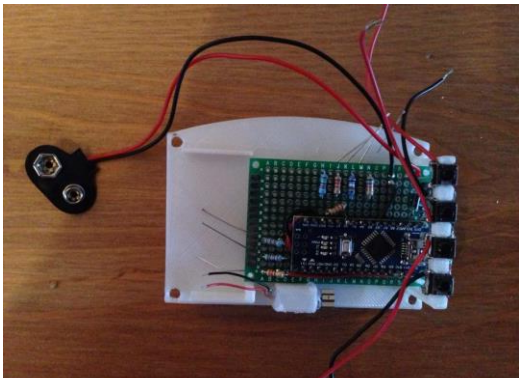


Image 17: Back casing with attached PCB and buttons.

e. Website for health care providers

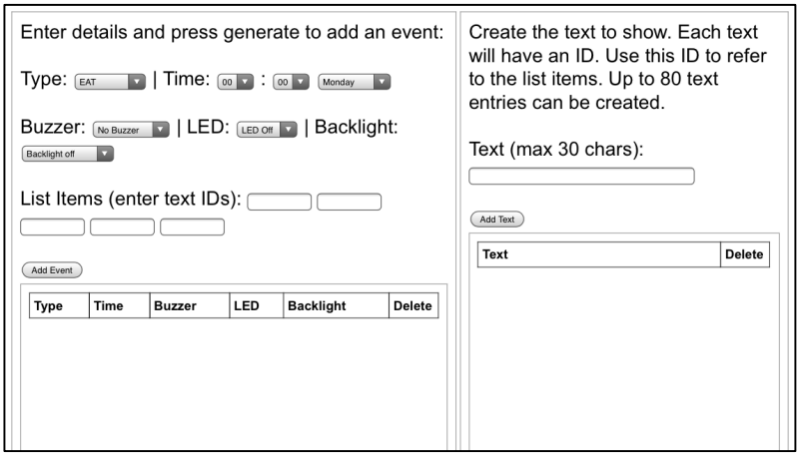


Image 18: Website for health care professionals

The device is connected to a user-friendly program designed for the health care providers where they are able to insert the patient-specific information in each category and the time of the notifications (Image 14). They can also choose the type of notification: a buzzer, LED lightbulb, background light or all of them together. Due to costs, the program connected to the prototype of this device is produced as a file. However, for future developments a website will be designed for easy access for all health care providers that are accompanying patients with the TamaCare device.

Design and progress: The concept of the website was designed using notepad++. Currently, the website is created in a very simple manner as the focus lies with the product itself. As the market expands and increases to include various health care professionals, the focus would shift to the website in order to provide a reliable and simple service to the health care providers as well.

f. Why should I buy TamaCare?

Most of the existing devices that have been previously mentioned in the market research, are either very expensive (especially the high-tech devices), or they only cover one problematic aspect of the senior's life (e.g. automatic pill dispenser or activity tracker Silmee W20 & W21). Furthermore, devices such as the Grand Care system and the Independa TV cannot be carried around and are stationary. TamaCare, however, is portable and can be carried around on the belt, around the neck or in the pocket. Furthermore, it is much more affordable and gives reminders for a multitude of the commonly forgotten activities by seniors (medication, activity, appointments, food, drinks, social contact). The pet that they have to take care of is also a feature that none of the other devices has. However, as previously mentioned, the senior will feel more responsible and motivated to fulfil the activities as the owner's need are reflected in the pet's needs.
The only device that covers a multitude of aspects that the TamaCare device covers is the Lively watch. However, it is only available in the US, Australia and the UK, and includes quite high monthly service costs if used over a long period of time.
The main goal for the entrepreneurs is to improve the quality of life of the elderly, especially focusing on their activity of daily life. The idea is to achieve this goal in a fun and socializing way which would increase their adherence to different treatments. This in turn would make life easier for the health care professionals and will increase the cooperation within the multidisciplinary team.

g. Future vision

The vision for the future is to further develop this device in order to include some objective measurements to reassure that the patient adheres to the treatment, such as a heart rate monitor and a pedometer for activity tracking. Furthermore, passive activity sensors, fixed on the fridge and pill box, and notifying family members and care providers via e-mail, text or mobile app if something is wrong, are currently being developed. Also, in the future the idea is that the health care team will be able to keep track of the activity patterns of the owner and in such a way follow their treatment process from the clinic. This will require WIFI when the patient is in an area with WIFI access or GPRS. Family members and health care professionals will be allowed to access and track the patients with a monthly subscription fee of a few euros.

Furthermore, the designers of the TamaCare device hope to expand the tool to other target populations, for example children with physical and mental disabilities, such as Cerebral Palsy or Down syndrome. The device would be adapted to this target group to provide special aid to their disabilities while keeping the aspect of fun.

Finally, the future vision (the 10 year plan as of now) is to further include a mobile application which functions in a similar manner. The current adults are more accustomed to technological appliances and applications and therefore a possible future aim is to simply provide a mobile application which would

function in a similar manner. This would result in fewer devices for the senior to carry around as well as a decrease in production costs.

5. Advertising:

In order to advertise the TamaCare device, we progressed in a structured way.

First of all, we decided on which audience we wanted to reach with our advertisement. Therefore, independent seniors, the main target population of our device, were thought of first. However, as the children often take over the decision making process when their parents become older, we also found it important to make our device interesting and visible to them. Additionally, we thought it was important to also advertise our product to the health care professionals (doctors, physiotherapists, nurses, psychologists, social workers, home care companies etc.), who are part of our product and who play an important role in advising the elderly population and their families. They have a closer relationship with our target population, and therefore, also a better insight into who could benefit from our device.

Secondly, we decided on target locations to make sure our advertisements would reach the right audience. We figured out that the elderly population would most likely see it on TV or read about it in the newspaper, as it has been shown that over half of the elderly population read the newspaper.(33) The parents of the seniors would be best approached through the internet (a website), social media and in the practices of their own health care professionals (by posters and flyers). In order to reach health care professionals, we would like to advertise at medical conferences and present our product to the medical world through a short presentation.

All in all, we decided to produce the following advertising products:

- The internet becomes more and more important when it comes to information retrieval. A majority of the younger population (about 26% of the population) and an increasing number of those aged 40+ (approximately 20% of the population) frequent the internet every day. (34) Therefore, the creation of a **website** was important for the advertising of our product. Please follow the link: **http://ninagoedert.wix.com/tamacare**
- We also chose to create a **Facebook page** for our device, as this is one of the most frequented social media networks available. Please view the link: **https://www.facebook.com/TamaCare/**
- A **poster/flyer** (Appendix II) was created to be sent to private health care professionals' practices and put up on the wall in waiting rooms for everybody to see. This may target not only the seniors who frequent these places more and more when they become older, but also the parents of the seniors who regularly pass those locations either for themselves or because of their children.
- The **brochure** (Appendix III) has the same function as the poster/flyers, and will be put in the waiting rooms of private practices as well as handed out to health care professionals during medical conferences. It contains more detailed information about the device and its use. The brochure can also be ordered online via the website.
- The **newspaper advertisements** are important to reach the seniors (the majority read the newspaper daily) as well as those parents who don't frequently use computers or other modern

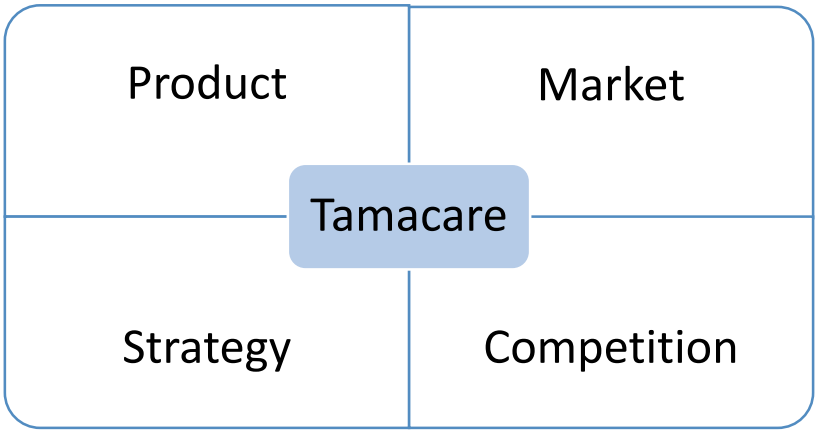
technology. The newspaper advertisement has the same layout as the poster/flyer (Appendix II).

- A **10-minute presentation** about our device to be held during medical conferences throughout Sweden. The presentation is going to be the same as the one presented at the Entrepreneurship symposium on January 25th. In a later stage, when our product is in a further stage of development and well-established in Sweden, we would also like to present it at medical conferences throughout Europe and further.

Future approach to advertising: Due to our limited budget and resources, it was not possible to record a commercial for TV. This may be possible in the future when the development of our prototype has advanced and crowdfunding has been started via websites such as www.kickstarter.com (see Financial support for future approach). Another future possibility, in order to approach a bigger network of costumers, is through buying internet advertisements to make our product more visible to the world. In addition, an approach would be to pair up with selling platforms, such as Amazon, dedicated to online shopping.

6. Strategies and management:

a. *Approach*



The figure gives an illustration on how we will approach the production and marketing of the TamaCare device and below is the current status of the manufacturing at this point in time.

Product

The first prototype is in under construction, and according to schedule. The engineer, working at a private company in Eindhoven, The Netherlands, in charge of producing the device is currently working on the frame using a 3D printer and the software. He manages the time himself, as he also has coexisting assignments at the current time. One of our main executives has daily contact with him, in order to maintain a professional work relationship and to give guidance on the desired design.
The different pets available on the Tamacare device are designed by an artist. She has made drafts, which we have evaluated. She received our feedback, and she will make some alterations. She will present us with new and updated proposals, which will be more accurate to our request. We will schedule an appointment with her when she has made new drafts.
On the 14th of November 2015, we will have a status report where the designer and engineer will give us a short update on their latest progress.

Market

A research of the market in Sweden has been conducted. With the background information of Sweden, we will investigate which sector or company we will try to initiate contact with. This is a part which the entire group will discuss at the next meeting. Besides making contact with potential clients, we are going to decide on which type of marketing strategy (web page, leaflets, brochure etc.) will be used and how we are going to design a brand and logo/slogan (branding).

Strategy

In our timetable, we have set up when we have project group meetings. In this meetings we will decide on how we would like to market our product. As mentioned in the previous paragraph we have to decide on marketing strategies, but also how we are going to structure the plan. The technical aspects will be taken care of by our external employers.

Our plan is to focus on the market part, on how we are going to sell our product. (see timetable for detailed description). After the feedback meeting on Thursday 5th November, we are going to have an internal meeting and make adjustments.

Competition

As a newly established company there is always a risk of new competition rising. We strive to be an innovative company where we have a lookout for incoming competition. We see it as an important factor to be up to date with existing companies, and their products and development.

b. External Advice:

Although the entrepreneurs of this product are future health care professionals, external advice was necessary in order to get more insight into current healthcare situations and professions. As health care providers will play a big role in the services we offer, it was important to ask for their feedback. Furthermore, we found it essential to ask the opinion of prospective future customers as the device is aimed towards assisting them. Their input into the design, functions and features of the TamaCare is of great value as we aim to provide a simple, user-friendly device for the elderly.

Therefore, several interviews were performed with a nurse mainly working with elderly, a general practitioner, a physiotherapist and an elderly person. The interview was set-up and planned prior to the meetings in order to guarantee that all our questions and queries were answered as well as to ensure an efficient use of time. Their advice and suggestions will help to consider certain facts and improve our future device. The interviews can be found in Appendix IV.

c. Quality requirements: SWOT analysis

Table 2: SWOT-analysis

Strength	Weakness
Easy to use – based on simplicity and quality, it is user friendly and durable. Especially made for elderly. **All in one -** Everything in one device, which makes it easier for the client. **Potential for further development** – Expansions to the product. E.g. training program installed into the device, GPS tracking system to help them get somewhere etc. **Large group of consumers** – With a large group, there is a bigger potential of sales **Price** – Will be an affordable product. **Small and portable** - small enough to fit into a pocket, and easy to transport **Fun** – it is more amusing as It is a small animal which you have to take care of. **Structure daily life** – as the device has a calendar, it is easier for the client to keep track of his daily activities (eating, drinking, exercise, medication, appointments etc.)	**Branding –** Sell the product to the companies/ consumers. **Market share** – Difficult to enter the medical market with a new product. **Electronic product** – Main target is elderly consumers, and even though it is made as simple as possible it might be clients which may not be competent/confident enough with new technology. **Established products on the market** – Competing with existing products.

Opportunity	Threat
Make daily life easier - The use of the product can make daily life easier for the consumer. **Systemize ADL** – The clients daily tasks is stored in the product so it makes it easier to follow. **Customize the product** – Fit the product for each clients need. **Workload relief** – the device will help health care givers with taking some workload of their back. **Socialize** – helps with socialization, and gives positive feedback to the user. **Medication** – serves as an external reminder for the client when medication should be taken. **Provides information to GP** – As everything is being saved, the GP/ or other health care professionals can monitor the progress, or if the client is following the plan.	**External changes** (legislations, politics, taxes etc.) **Costs of material and manufacturing** – increase in costs and manifacturing affects the businesses financial status **Competition**– other companies making similar products **Electronic malfunctions** – System failure, components not working or other problems which can damage the device quality reputation.

d. Time schedule

Table 3: Time schedule

Date	Type of meeting	Agreement	Responsible person
15.09.2015	Entrepreneurship Lecture	-	Feitze van der Ende & ES 4th year students

16.09.2015	Project group meeting	Gathering ideas, brainstorming, mind mapping	Project group (Megan Kruger, Haugen Jo Vegar, Goedert Nina, Hubinak Petra, Keyser Jon)
17.09.2015	Entrepreneurship workgroup meeting	Inventory & consulting of different business ideas, mind mapping, establish working arrangements	Feitze van der Ende, project group & other students
18.09.2015	Project group meeting	Developing & narrowing down the idea, working out patient case, design and features of the device	Project group
23.09.2015	Meeting with engineer	Presentation of the idea, discussion about costs, realizability, procedure, deadlines	Michael Kruger & project group
26.09.2015	Meeting with artist	Presentation of the idea, discussion about the creation of “Tamacare animals”	Arlen van Rens & project group
01.10.2015	Entrepreneurship workgroup meeting	Consultation meeting	Feitze van der Ende & project group
05.10.2015	Project group meeting	Dividing workload of the project plan	Project group
12.10.2015	Project group meeting	Preparing presentation	Project group
15.10.2015	Entrepreneurship workgroup meeting	Presentation of the project plan & feedback by teacher	Feitze van der Ende & project group
03.11.2015	Deadline Project plan	Handing in project plan	Project group
05.11.2015	Entrepreneurship workgroup meeting	Discussion about/ feedback on the project plan	Feitze van der Ende & project group
12.11.2015	Project group meeting	Refine SWOT-analysis, accountability & results, improve points of feedback in project plan, divide workload	Project group
13.11.2015	Project group meeting	Preparation of presentation, working on marketing strategies (website, flyers etc.)	Project group

14.11.2015	Meeting with engineer	Discussing process and results	Michael Kruger & project group
14.11.2015	Meeting with artist	Discussing process and results	Arlen van Rens & project group
16.11.2015	Entrepreneurship workgroup meeting	Presentation of accountability &results & SWOT analysis to other enterprises, feedback	Feitze van der Ende & project group
20.11.2015	Project group meeting	Discussing problems and dilemmas, marketing mix	Project group
25.11.2015	Project group meeting	Preparing presentation	Project group
30.11.2015	Entrepreneurship workgroup meeting	Presentation of 5 dilemmas, presentation marketing mix, feedback	Feitze van der Ende & project group
10.12.2015	Project group meeting	Working on final product	Project group
17.12.2015	Project group meeting	Collecting ideas for symposium, divide workload	Project group
18.12.2915	Entrepreneurship workgroup meeting	Promotion plan for presentations at symposium & Consulting meeting	Feitze van der Ende & project group
05.01 – 09.01.2016	Project group meetings	Finalizing product	Project group
???	Feedback from external expert		External expert & project group
10.01.2016	Deadline final product	Handing in the final product	Project group
11.01.2016	Entrepreneurship workgroup meeting	Preparation presentation, presentation scenario	Feitze van der Ende & project group
11.01. – 24.01.2016	Project group meeting	Preparation presentation, practicing presentation	Project group
25.01.2016	Symposium/ Final presentation	Presenting the final product	Feitze van der Ende & project group & audience

e. Estimated costs

The prices of the components described below are for the production of a single device. However, with mass production the price will decrease considerably.

Component:	**Price:**
Plastic casing: white Poly Lactic Acid biodegradable plastic (environmentally friendly)	About 1,00 euros *(25 euros for 400 meter)*
LCD Screen: 2,8 inch with a resolution of 320 by 240 pixels (TFT LCD)	About 9,00 euros
Lightbulb: three colour RGB to produce all colours	About 0,10 euros *(4 euros for 50 lightbulbs)*
Buzzer: Piezo electric (crystal reacting on electricity) with 1-4 kilohertz frequency	About 0,25 euros
Vibration motor: brushless DC	About 0,50 euros
Power supply electronics: regulator chip and components	About 0,50 cents
Battery connector	About 0,10 euros
Battery: 9 volt Duracell Plus Power battery	About 5,00 euros
Heart rate monitor: green light	About 4,50 euros
Button: momentary push buttons x 4	About 0,80 euros
Microcontroller: ATMEGA 328P, 32 kilobyte ROM, 2 kilobyte RAM, 8 BIT controller, 16 megahertz	About 2,50 euros
Web interface browser software[1]	free
	Total: 24,25 euros

Due to the fact that the device is still in the testing phase, doubles of some components were purchased in case of faulty parts or errors during production. Furthermore, some parts cannot be purchased as single components, but are only available in packets of for example 50. As a result, the team has invested a total of 100 euros in this project (20 euros per team member).

The engineer, Michael Kruger, producing the device for this project as well as the artists, Arlen van Rens and Marcin Twardowski, designing the TamaCare pets are working on a voluntary basis. They will however receive home-cooked meals for their efforts.

Currently, the approximate price of production for a single device is 24,25 euros. However, the current manufacturing price does not take into account labour as the engineer as well as artists worked on a voluntary basis. Therefore, the production price would increase and would vary depending on the

[1] If the product will be used for medical professionals, a basic virtual private server will be purchased in order to create a proper website for the health care professionals. To maintain the website a price of 10 euros per month will be required and 20 euros per year for a domain.

professionals recruited for the construction and designing of the device. Contrary, the price would also decrease based on the fact that mass production results in a lower cost of components. These aspects need to be taken into consideration in the next phase. Currently, the team has decided to put the product on the market for 75 euros. This would cover the costs of production while offering an attractive and affordable price to customers as most products are considerably more expensive (see market research section above).

f. Financial support for future approach:

i. Private sector:

In order to launch our device in the future, financial support will be needed. As a result, research was conducted to find the best approaches for financial aid to further develop our product.

Kickstarter: After thorough research, our team found an innovative way of financing our project. An internet website called Kickstarter helps to bring creative projects to life. (35) Kickstarter aids many starting professionals in finding the resources and helps them realize their ideas. To date, tens of thousands of creative projects — big and small — have come to life with the support of the Kickstarter community. Kickstarter is a funding platform where donations – ranging from one dollar to thousands of dollars - can be made in order to finance different projects. As a result, we aim to use this website as a foundation of financial support in order to further develop our product so that we could approach the private market in Sweden.

The Kamer van Koophandel: Our team contacted the Commerce Centre in Eindhoven in order to receive more information about setting up a business in the Netherlands. We asked about the financial process when trying to introduce a new product to the market. The contact was through telephone and email. The response we got from them was that Koophandel primarily focuses on the most important aspects of successfully setting up a business in the Netherlands. What we received were different links to other organizations that had more information about the actual financial aspects.

- The Dutch government has a funding program called “Proof-of-Concept Funding”, which helps innovators with financial support in order to construct their product. This is aimed for companies who are in the beginning phase, which would be a good fit for Tamacare.

- Another possibility to receive financial support would be to ask for “innovatiekrediet”. The Dutch Ministry of Economic Affairs has a program for entrepreneurs who are in need of financial support in order to realize their product. “Innovatiekrediet” is a direct loan and could provide a potential financial foundation for the TamaCare team.

Monthly payments covered by the client: It costs approximately 20 euros a month in order to set up a proper, premium account for a website. In addition, monthly costs would go to the website created for the health care providers in order for them to access and program the TamaCare device. In order to cover these monthly expenses, we would ask for a small maintenance fee of 25 euros/month from our customers. This fee would include a full costumer service, where the clients could call if they would need any help with the device. Additionally, there is always a chance of simple malfunctions, seniors dropping the device or misplacing it which could be quite expensive. Therefore, in this maintenance fee, a customized insurance for the device would be included. Finally, a "start-up" workshop where representatives from the company teach the users how Tamacare works will be included as well.

Monthly payments covered by the health care professional: Once the device has been approved by the health care system and has been established as a common device used, the team would ask a monthly administration fee from the health care providers. This would allow the professionals to access the senior's TamaCare account where they could keep track of the activities of the senior in order to ensure that the senior is adhering to his/her medication and other therapies. In order to ensure that we provide a safe and secure system where the privacy of the client is ensured, we would ask of a monthly payment of 5 euros per client from the health care professionals/state.

ii. State:

If our launching of the product succeeds through the private sector, a future vision of launching our product through the state is considered. Once our product is established as a useful, user-friendly and medically beneficial tool, we hope the state would be willing to advise and distribute our Tamacare device. At this point in time we would approach the state at medical conferences with a prepared presentation in order to convince the health care system of the benefits of our device.

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8. Appendices

a. Appendix I: Case example- Michael

Background information: Michael is an 80 year old man who lives alone in Stockholm in a one bedroom semi-detached house. His wife passed away 5 years ago due to a heart attack. He has 3 children who regularly visit him and take turns attending his medical meetings.

Medical information: As one grows older, more health problems arise which is a natural part of life.(36) Michael's medical information is as follows:

- Michael is overweight with a BMI of 28kg/m^2. He has had mildly elevated cholesterol levels (total cholesterol level of 220mg/dl) for the last 10 years as well as high blood pressure (150/90mmHg).(37,38) He used to smoke when he was younger, but quit about 30 years ago.
- Recently Michael's children have raised their concerns about his memory. As a result, a MMSE (mini mental status examination) was done which is a series of questions asked to test a number of every day mental skills.(39) The test result was 25 which is on the border of mild and questionable significance diagnosing him with a mild cognitive impairment likely to only affect the most demanding ADL. However he is still able to function without full-time supervision.(40)
- Due to the normal aging process, Michael has osteoarthritis in his right knee. About 23% of elderly over the age of 65 years have osteoarthritis in the medial compartment of the knee joint.(41)
- For the past 5 years Michael has also had complaints of aspecific lower back pain, a condition found in more than 70% of the geriatric population.(42)

Medical team: Michael has a multidisciplinary team of health care professionals in the neighbourhood, each playing a role in his health.

- Physiotherapist: A musculoskeletal physiotherapists working with geriatric patients helps with the osteoarthritis and lower back pain. She also set up an exercise plan for him to help tackle the weight problem.
- Primary physician: His doctor is in charge of his general health and responsible of checking his medicine and social aspects.
- Dietician: His dietician has set up plans in order to tackle his weight problem, is responsible for a general healthy lifestyle and setting up a diet plan to control the elevated cholesterol.
- Home care volunteer: A lady comes 3 times a week to clean the house, do gardening and help with grocery shopping for Michael.

Health plan for the TamaCare: Michael has received his TamaCare 2 months ago. He has meetings on a regular basis with his multidisciplinary team to update his TamaCare device. Below is an example of his reminders.

1. **Medication:**[2]

- Notification at 10:00 - *Lisinopril (for the high blood pressure), 5mg once per day*(43)
- Notification at 10:00 - *Atorvastatin (for the elevated cholesterol), 20mg once per day*(44)

2. **Calendar/social:**

- *Day 1:*
  - Notification at 8:15 - *Anna (daughter) is turning 45*
  - Notification at 10:00 - *PT appointment for lower back pain at 10:30*
- *Day 2:*
  - Notification at 8:30 - *Home care volunteer at 9am for grocery shopping and house cleaning*
  - Notification at 17:00 - *Grandchildren visiting at 17:30*
- *Day 3:*
  - Notification at 11:30 - *Appointment with physician at 12:00 (general check-up)*
  - Notification at 19:00 - *Bingo evening at 19:30 with group*

3. **Drinks:**

- Notification at 8: (one reminder every 1,5 hour in order to reach 8 glasses) (45,46)
  - *A glass of water*

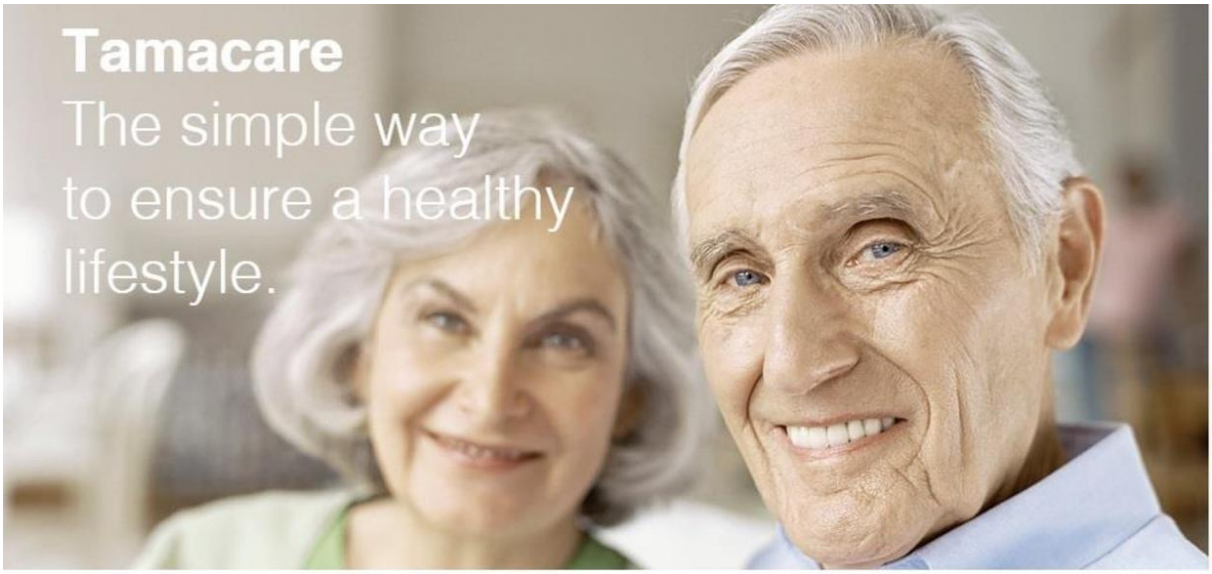
4. **Food:**(47)

- Notification at 8:00 - *Breakfast:*
  - *Half a cup high fibre cereal*
  - *Fruit item*
- Notification at 10:00 - *Snack:*
  - *2 digestive biscuits*
  - *Fruit item*
- Notification at 12:30 - *Lunch:*
  - *2 slices whole wheat bread with leafy greens, cold meat and cheese*
  - *Mixed green salad*
- Notification at 16:00 - *Snack:*
  - *1 cup low fat/greek yoghurt with handful nuts*
  - *Fruit item*
- Notification at 18:30 - *Dinner:*
  - *100grams(10) of fish/poultry*
  - *½ cup carbohydrates*
  - *>1 cup vegetables*

[2] Contact was made with a geriatric nurse located in France in order to discuss typical medication used by the elderly population.

5. **<u>Exercise: (generally elderly need 150min of exercise a week)</u>** (28,48)
    - Notification at 10:30 - *15 min walk*
    - Notification at 15:30 - *Strength program for core stability/knee (printed on his wall)*
    - Notification at 18:30 - *15 min walk*

b. Appendix II: Poster



Do you or your parents live alone and need small reminders to ensure your/their health and well-being?

Your personalized TamaCare assistant is a **simple, practical** and **user-friendly** device that gives reminders for multiple essential daily tasks (food, medication, exercise etc.).

It is fully programmed by your care providers and will **simplify your life.**

For more information:

- visit our website: **http://ninagoedert.wix.com/tamacare**
- call us: **0031-1123211234**
- send us an e-mail: **mytamacare@gmail.com**

c. *Appendix III: Brochure*

Virtual pets for motivation

When a notification pops up, the TamaCare pet becomes sad. It is the duty of the owner to click on the notification and do as it says in order to make the TamaCare pet happy again.

The TamaCare pet is meant to increase the sense of responsibility of the owner and can be individually chosen (dog, cat, cow, deer) in order to assure a personal connection between the owner and pet.

Example:

Sad dog.

Happy dog.

Using the online dashboard for health care professionals and relatives

Health care professionals and relatives can login into the user-friendly online dashboard via our website.

They can program the categories, the exact time and the type of notifications needed by each individual patient. Updates on changes in treatments can be uploaded by the different care providers when needed in the same way.

They can also track each patient's activity patterns, which are saved on this device and react appropriately in case of non-compliance.

It's easy, safe and efficient.

[Adventure Works]

Phone: [Phone number]
E-mail: mytamacare@gmail.com
Website: http://ninagoedert.wix.com/tamacare

Tama Care

A fun and simple device for motivating and helping elderly people to remember important daily tasks.

The TamaCare device

The TamaCare assistant is a lightweight, handheld device designed as a medical and social tool for seniors living independently at home.

Why TamaCare?

The ageing process brings about an increase in many health conditions. One of the more important conditions that come with age is the decline of cognitive ability. Although it is not always diagnosed as a medical condition and is often a purely natural ageing experience, cognitive ageing can affect the daily lives of the elderly. It can also lead to a decrease in adherence with medication and therapeutic interventions.

The aim of the TamaCare device is to remind seniors of the most important activities and tasks during their daily life. This can not only help increase the user's compliance with medicine, dietary advice, exercise and social interaction, but will also leave their children unconcerned about their parents' daily routine patterns.

Can you or one of your parents benefit from the TamaCare device?

Are you or one of your parents living alone at home? Do you/they frequently forget to take the prescribed medication by the doctor? Are you/they not active enough? Or do you/they often forget important appointments?

If these are common concerns to you, the TamaCare device is an efficient way to help you and your family in the successful management of important daily life routine patterns and may help increase compliance to a variety of treatments.

The device will also improve the collaboration of the different health care providers and thus, ameliorate the provided services.

What is TamaCare?

TamaCare gives the user individual reminder notifications, which are previously programmed by the health care professionals and the family of the senior. So, for example, when it is time for the senior to take their pills or engage socially, notifications will pop up.

The notifications can be related to medication intake prescribed by the family doctor, the exercise program from the physiotherapist, nutritional advice given by the dietitian, social engagement with family or friends and many more.

Technology made easy

We designed the TamaCare on the principle of simplicity, so that anyone can use it.

The device works with light, vibration and sound to reach out to elderly with any kind of disability affecting the senses. We also made it user-friendly by only installing four self-explanatory buttons on the device.

No understanding or former experience with either computers or modern technology is needed and updates are set remotely by the health care professionals.

Healthy lifestyle reminders

Physical activity helps reduce the risk for a number of diseases and counteracts the risk of falling.

TamaCare gives individualized reminders to engage in physical activity and to comply with individualized tailored programs set up by their physiotherapist. This data will be saved and can be checked by the health care professionals later on in order to regularly adapt the treatment and to increase the patient's compliance.

Furthermore, the device makes sure, the seniors take their medication on time and prompt with check-ins for other vital activities, such as regular meals and sufficient fluid intake.

Event and appointment alerts

These reminders are planned and programmed together with the family to make sure that the senior attains important appointments, such as physical therapy and doctor consultations.

Additionally, events such as birthdays of loved ones, hairdresser appointments and plans for the holiday are added.

Social interaction reminders

Staying connected and in touch with friends, loved ones and the outside world ensures seniors don't feel isolated and lonely. This is an essential aspect of good health, which is often forgotten by the elderly. Examples of such notifications are afternoon tea with friends, card sessions or bible meetings with the community -all personalized to the user.

Care from anywhere

Care providers can access their patients' daily life routine file by a simple login and notice the first signs of change before bigger problems arise.

Family members can also set personalized reminders for appointments and events by a simple login via the website.

d. Appendix IV: Interviews for external advise:

Name: Lionel Bouniol
Profession: General practionner
Address of the practice: 55 rue Roussy, 30000 Nîmes, France
Telephone Number: 0033 4 66 29 24 23
Age: 46

-Would you be willing to use such a device within your own practice?

"Yes". However, to use such a device on elderly, they need to really understand the concept of it. The important thing to think of here is to give a good explanation of what this device is and what it actually does, and who it is targeted for and why. A good patient education is needed and has to be informative and explained in such a way, that people don't get offended and don't think we are proposing them such a device because they are dumb and forgetful and not able to take care of themselves on their own. You also have to think of the profile of the patient you would propose it to: Motivated patients that like the concept because they could still lie, and their environment and family need to be informed.

- Would you be willing to use the device yourself one day, if needed?

"Yes". But it would depend on the situation. Within a couple, if one has dementia or starts to be forgetful and the other is fine, the healthy partner will want to take care of the other one. Perhaps in that case the device wouldn't be necessary and wouldn't neither be welcomed."

- Do you think this product is a good idea according to your professional experience?

"Yes."

- Do you think this could be a useful and effective product?

"Yes, it could be. But this can also be questionable because you would need to convince the professionals around it and the patients to use it. Everyone has to agree, and that could be hard work."

-Can you think of something else to make it easy to use?

"It is a good thing that there is sound and colour. It is good that it's small and portable, probably once the prototype is made it will be more noticeable what is good and what is not quite right yet with it and then from there further improvements will be made"

-Can you think of another target population?

"Definitely children, because perhaps older generations most of the time have trouble to use technology even though it is as simplified as possible. Also within couples, if the healthy person is swamped with responsibilities they also need reminders for their partners. It happens often that the partner leaves them at the same spot most of the day. The healthy partner would need to be more informed and reminded of moving the person, or going for a walk, or try little exercise etc."

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Name: Jill Zeimetz
Address: Rollingen, Luxembourg
Tel.: 00352 661 900 241
Age: 23 years
Job: Physiotherapist

-Would you be willing to use the product within your own practice/recommend it to your patients?

Yes, especially for children and elderly people.

-Would you be willing to use the product for yourself in case if need in the future?

Yes, as I am myself very forgetful, especially concerning drinking enough water, and with age it will probably get worse.

-According to your professional experience, do you think it' s a good idea?

I think it is very useful! In my practice I see a lot of children coming in with back pain due to a lack of exercise. In our society a lack of exercise in children is a big issue and I think such a device can be an additional motivation. Also elderly people are very forgetful and the device could definitely help them. Frequently patients also tell me that they forget the home exercises and as the physio is able to set up the advice I think it is very handy.

-Do you think it would be effective/ efficient?

Yes, I think so, but only for people who are motivated to change their way of life.

-How do you think elderly would react to the device?

I think you would need a lot of time to give elderly patients enough information about the device. As they are often not open for new and modern technology, it might be necessary to explain them very detailed why it is so useful. Additionally, it needs to be easy to handle for them.

-Can you think of anything else to make it easy to use/ fun/ more useful, using your professional experience?

No. The only thing I could think of is that it would be nice if the physiotherapist could program exact exercises on the device, because my patients often forget them when they have to do them at home.

-Any other target groups you could advise within your proffesional experience and knowledge?

As I have a lot of patients with Parkinson's disease I think it could be really helpful for them as well. Also for neurological patients it might be useful. Additional suggestion: exercises with

external cues are suggested for patients with Parkinson's disease. So I think it would be nice to have the possibility to have exercises where the device would give a rhythm/a sound/ vibration as an external cue to facilitate the exercises to them.

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Name: Slavka Palesova
Profession: nurse
Address of the practice: 3150 rue de la Cigale, 30900 Nîmes, France
Telephone Number: 0033 6 79 61 91 57
Age: 42

Mrs. Palesova is a private nurse. This term is used in France to describe a nurse going to patients' homes and providing the care needed.

-***Would you be willing to use such a device within your own practice?***

"Yes, why not? But only if this is not too time consuming. We are already quite busy as it is. We need to drive to patients' houses and provide them with the care that is needed and sometimes, depending on the types of patients demanding our services things can be very busy and we rush in order to see everyone in time."

-Would you be willing to use the device yourself one day, if needed?

"Hmm… I think it would depend on my situation. Maybe if I feel lonely or would need some kind of interaction with something perhaps. Or maybe even if I live with someone else it could be useful to remind me of things so my partner doesn't have to do it all the time."

- Do you think this product is a good idea according to your professional experience?

"Yes it could be. But I think people in the healthcare system are busy, and if it proves its value and usefulness and healthcare professionals as well as patients are willing to use such a product, it has a potential to be a good idea for everyone."

- Do you think this could be a useful and effective product?

"Yes. Useful yes. But I think only a certain type of patients would be motivated to really use it properly and thoroughly. It is those who like pets, or used to have pets and are looking for some kind of interaction and connection to animals and at the same time reminders. It will only be effective if the patient takes it seriously and is motivated to work with it, because the patient can also lie and press the green button and everyone thinks they have done their exercises or pills when they actually didn't. Some sort of double check is also needed."

-Can you think of something else to make it easy to use?

"Maybe resistant to shocks? In case an elderly person falls."

-Can you think of another target population?

“I remember when the Tamagotchi came out. All the kids were crazy about it. So I think children would be pleased with it.”

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Name: Anne Jacoby
Address: Soleuvre, Luxembourg
Tel.: 00352 592811
Age: 80 years old
Home situation: Husband died 1 year ago, living independently, alone at home

-What do you think of the idea? Would you use the device yourself (if needed in the future)?

At the moment, I am still quite fit and only need to take 2 different kind of pills, so I think that, at the moment, I don ‘t need such a device yet. However, I find it a very good idea and it seems very practical to me. I would definitely consider using such a device in the future! Since a year, I have a bracelet with a button that I can push if I fall or if something happens and which then automatically calls my daughter. This I also find very helpful, but let me know if you develop your product, I would like to try it! Nobody knows how long I will be able to live like this.

-How would the elderly population react to it? Do you think it can help improve the compliance of treatment and make their daily life easier? Is there necessity for such a device?

I guess there are always people that are reluctant, especially with elderly. I think that there is a number of elderly people who just don’t want to adapt to anything anymore, no matter if it is their new hearing aid or a device like yours. However, I find it a shame that those seniors don‘t even want to try to use it, because there are so many great things and I think you need to try out in order to get used to such things. You need go with the time as long as possible. However, I am not sure if there will be many seniors that will be reluctant to the device, as most of my close friends are a bit younger than I am and don ‘t really need anything like this yet.
Yes, I definitely think it could help people to be more compliant with their treatments. However, I think it would not only help the seniors, but also their relatives. When my husband‘s health status became worse, the doctors changed his medication so often, that my husband and I didn’t know anymore what he had to take. If the doctor could just program it into the device every time there are changes, this would be so much easier for the relatives. Also, I think that with such a device, the children of the seniors would be less restless and more secure about their parents actually doing ok. When my parents became older, I called them every day to check if they were ok, or I drove there. With such a device I would have probably been a bit quieter.

-Can you think of anything else to add to the device, to make it easier to use/fun/ more useful?

On my phone, I have an app which I can use to track my car. This is very handy if you are in a big parking lot and cannot find your car anymore, because it shows you the exact location of

it. Maybe that would be an idea to include in the device for people who are still using their car to do groceries.
Furthermore, I think it would be very important to integrate kind of an emergency button that the senior can push when he/she falls or something else happens. Firstly, a lot of people have such a device, and it would be annoying to always carry two devices around, and secondly, there are so many people with an increased risk of falling, that it is a must on such a device. I also find it a pity that the device I have only works in my home and not outside when I go to the market, so that would be an important thing to include: Make the emergency button work everywhere. For example, now I also have a phone with an emergency button that calls my daughter immediately if I push it. This is the most important thing for me to be added.
I also think that a contract will be necessary in order to cover all the maintenance costs. This should not be too expensive though, as people from the middle class like me, do not have such a huge income from their pension and cannot afford expensive contracts. At the moment I pay 45 euros a month and that is about the maximum which I can spend on it per month. Maybe it is also important to have a monthly check-up to see if everything works properly; you never know with these new technologies.
It would be great if you could manage to add all the necessary features together into one device (GPS tracker, emergency button, the features it contains now etc.) and make sure it works also outside of the home.

-Are there any other target groups that would have beneficial effects from this device?

Yes, I think this device could be used with children as well, especially if you integrate something more fun and maybe something like a GPS and a help button that calls their parents in case of emergency. Things happen so fast.

- How would you preferably carry the device around?

At the moment I have that bracelet around my arm, and it is quite ok, but sometimes it happens that I accidently hit the button while doing laundry or cleaning. Therefore, I think I would prefer to carry it around my neck. Of course the device cannot be too heavy then. Seniors usually wear blouses or blazers that can cover the device, so it wouldn't bother much. The bag is not easily accessible enough. I cannot reach it in there fast enough, but around the arm would also be ok.