Usability Testing for Yetihome

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Laurea University of Applied Sciences **Abstract**

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The purpose of this project was to provide usability data for the client company Kuori Oy. The thesis focuses on the Yetihome device which is a large tablet targeted at older users and users with disabilities. Yetihome is a new device that the company is launching next year. Thesis project does not examine all the aspects of the device but is intended as a base for more accurate and extensive usability testing. With this thesis the author became more acquainted with various usability testing methods.

This report highlights different ways to explore usability and attempt to identify testing methods that are best suited for a specific user group of seniors. As users of digital services, the elderly represents a unique user group. Their needs are different from the people who have lived in the digital world their whole life. They need more time and guidance. It's important to physically meet them and be present in the moment with them. The usability data for Yetihome device was collected by observing videos where users perform simple tasks on the device. The report contains an analysis that compares usability of the new device with the usability of the old Yetitablet device. The usability of the Yetitablet was researched with a user survey. Surveys were conducted by email. The questions were related to the normal usage of the device. The usability analysis follows Nielsen's guidelines. There have not been many studies on how to test usability of digital devices with senior users.

The thesis addresses the question of whether seniors are still able to learn new things even at advanced age. Yetitablet is supposed to be easy to use so a senior user who doesn't have a lot of experience with technology could learn to use it. According to the customer data, users who don't have a lot of experience with computers are not so eager to use the device on their own. The users who are used to using technology find the device very useful. The devices bring experiences of success and joy to the lives of the elderly. At best, the device is genuinely useful in everyday life. The screen brightness and size seem to be good enough for the users. One problem that came up, was that users need more ways for adjusting and moving the screen. The device has a voice-over function that is especially useful for users with bad eyesight. In the future the device could have an artificial intelligence option so it could communicate with its users. One small issue is the navigation bar, it is confusing to the senior users. Navigation could be developed together with a user group. Unusual new navigation designed just for the elderly user could be a competitive advantage.

Keywords: Tablet, Kuori, Usability, Elderly, Disabilities, Yetitablet

Contents

1 Introduction

Yetitablet is a forerunner in a big market. People are aging, they will need more digital tools in the future. The purpose of this thesis is to identify current usability issues and find ideas for future testing and improvement.

The first part of the thesis has a literature review that studies different usability methods and testing techniques. The study covers the specialties of the customer group and tries to find the best ways for testing the device with them.

2 Research subject and methods

This thesis will focus on the usability of Yetihome devices. The customer company of the project is Kuori Oy. The aim of the project is to collect data for further product development. The main objectives of the thesis project were: 1. Provide an outsider view. 2. Identify issues that still need improvement and 3. Give ideas for design development process. The purpose of my work is to provide information on the current state of the product. What could be done differently? How to test usability in the future? How can the company serve its customers in the best possible way?

Senior users are a challenging user group. Usability testing should be performed in a way that considers the specific characteristics of the customer group. These users don't have the same amount of patience as younger people. In usability testing they need more time to complete the tasks.

We currently live in a world where nothing is certain anymore. The covid-19 has changed our lives. The world has made a small digital leap into the future. This makes the demand for devices such as Yetihome even bigger. We need to find new ways to stay connected. Although some of the restrictions have been removed, the target group of this thesis belongs to the group that needs to avoid unnecessary contact with outsiders. In a normal situation I could go do usability testing with the test users. In the current situation I should find other ways for testing.

Usability testing for the purposes of this thesis will be done remotely. I will receive videos from test users. Phone interviews and a questionnaire for Yetitablet users is the second method that I will use. In my work I will make suggestions for future usability testing.

The customer company Kuori is a Finnish design, engineering, and manufacturing company specializing in custom touchscreen solutions. (Kuori, 2021)

The company was founded in 2015. This thesis focuses on its primary product Yetitablet. The product is a large tablet designed for users with special needs. The user group is seniors and people with disabilities.

The entrepreneurs are a Finnish couple Maria and Jarkko Jokelainen. Their background is from the ICT sector and start-up world. Jarkko has knowledge from engineering, he has worked in the technology industry for over 20 years. The couple has three autistic children. Combining family life and entrepreneurship is challenging. The product they have developed together works as a tool in their own life too. The initial idea for the Yetitablet came in 2015 when Jarkko started to develop a large screen that would be used as an info screen. He thought that "smartTV is made the wrong way, it should work as a smart device." all the manufacturers have their own systems. When you want to connect the tv to Netflix, every model has its own instructions on how to do it. The idea for a responsive screen came from there. The couple tested the device back at home. They noticed that the product was beneficial for their children. It worked as a tool for learning and communicating. Playing games on a big screen makes it easier to perceive figures and helps in developing cognitive skills.

Today the Yetitablet is used in many senior homes in Finland. The screen has many possible user groups. The large-sized screen can be used in construction sites and as an info screen in public spaces. Yeti is targeted for the social and healthcare sector.

Senior users who don't have much experience with digital devices will find it easier to use. The operating system is designed especially for these users. The system is made with open-source code. Users can use google apps on the device. Yeti has developed its own apps that are used in its devices.

In 2021, the company hired a new managing director who oversees the industrial market. Maria Jokelainen focuses on the social and healthcare sector.

The company revenue in 2020 was 2,5 million, according to Suomen Asiakastieto. In the year 2021 company has grown its market and revenue. Currently, Yetitablet is used in 7 countries. The company employs 20 people. The product is assembled in China. The company designs everything else. Kuori can create very custom solutions for its users. They develop digital tools that are used in challenging conditions. Their mission is to provide technology for users who were not able to use it before. There seems to be a demand for products of this type.

3 The Product and the user group

Kuori Oy is launching a new device called Yetihome. The product will be ready sometime next year. Initially, the product was supposed to be ready for its users this year, but the company got validation from google for their own android-based operating system. They wanted to improve the product before entering the market.

This device is targeted at home users, seniors living at home. The user persona is a senior citizen who still lives at home. They have assistants who come and help them with their daily tasks. Nurses and relatives come to visit them. Someone cooks and cleans for them. However, they still need things to do. These people are still aware of their environment. They might not function the same way as they did when they were younger, but they are still interested in the same things. Staying active can increase their life expectations. Many studies have shown that brain activities such as playing games, can be beneficial for seniors.

3.1 Game playing ang cognitive functions

The following studies have found indications of the benefits of stimulating brain functions. “Two major approaches have been used successfully to train older adults directly in cognitive abilities: (i) strategy training; and (ii) extended practice training. Strategy training is a ‘top down’ approach and has been used for training memory, reasoning, and complex planning tasks. Strategy training such as use of various memory training techniques, including specific mnemonics, general approaches to improving memory, self monitoring of learning and retrieval, and a multimodular program integrating memory training, psychosocial support, and goal management training, all improve recall. Other abilities successfully trained include complex coordination, such as organizing a carpool, and reasoning. Thus strategy training, broadly defined, improves performance on a range of different cognitive tasks compared with control conditions where there is no training.” (Zelinski, Reyes, 2009)

“Three hundred twenty-nine cognitively normal, middle-aged adults (age range, 43.2–73.8 years) enrolled in the Wisconsin Registry for Alzheimer’s Prevention (WRAP) participated in this study. They reported their current engagement in cognitive activities using a modified version of the Cognitive Activity Scale (CAS), underwent a structural MRI scan, and completed a comprehensive cognitive battery. FreeSurfer was used to derive gray matter (GM) volumes from AD-related regions of interest (ROIs), and composite measures of episodic memory and executive function were obtained from the cognitive tests. Covariate-adjusted least squares analyses were used to examine the association between the Games item on the CAS (CAS-Games) and both GM volumes and cognitive composites. Higher scores on CAS-Games were associated with greater GM volumes in several ROIs including the hippocampus, posterior

cingulate, anterior cingulate, and middle frontal gyrus. Similarly, CAS-Games scores were positively associated with scores on the Immediate Memory, Verbal Learning & Memory, and Speed & Flexibility domains. These findings were not modified by known risk factors for AD. In addition, the Total score on the CAS was not as sensitive as CAS-Games to the examined brain and cognitive measures. For some individuals, participation in cognitive activities pertinent to game playing may help prevent AD by preserving brain structures and cognitive functions vulnerable to AD pathophysiology." (Schultz, Larson, Oh, 2016)

Yetitablet has games that are suitable for older people. Simple games such as mind games that are easy to access can positively impact the mind of the elderly. It can be a very refreshing experience for the seniors to understand that they can still learn. Even if the user has no experience of using technology, they can still learn to use Yeti. The product has many features that are useful in everyday life. A phone call feature is one of those. Seniors don't need to search for the phone, they can just press the large phone logo on the screen when they want to call for someone.

3.2 The Device

The new Yetihome is located in a specific place at home. The company is still planning the best way to install the device in its place. It could have rails or hangers, so it would be possible to hang it on the wall.

The new Yeti has a feature that makes it possible to take control of the device remotely. A nurse or a relative can see what the user is doing with the device. Seniors may need some assistance when they're using the device for the first time. After that, they should be able to use it on their own too. The tablet home screen can be customized for the user's needs. The customer will choose the apps they want to see on the home screen. That can be, for example—a clock, weather, favorite newspaper, phone call, and radio channel. The device has a voice-over function that can be used if the user has bad eyesight.

The company has many ideas, how the device can be used. It could be possible to make remote rehabilitation for seniors. They could install sensors and use the video connection to see what the user is doing. This could help prevent falling or other accidents.

The interface is iterative and designed with the customer in mind. The standard interfaces are designed with the top-down approach. The design process starts from the big picture, and it's not designed with a specific user in mind.

Yetitablet design process begins with the user. They want to create a product, especially for their customer. Yetihome has gone through some usability testing with few users. First pilot

users are testing the device this fall. The pilot launching will give the company more data from the real users. They can use this information to determine whether the device still needs improvement or not.

3.3 Usability

Distributed benefits of a few hours per user are hard to measure and do not immediately add up to hard cash [Sassone 1987]. For example, redesigning the interface to an oscilloscope increased user productivity by 77% when they were using the scope [Bailey et al 1988], but the productivity impact on the total workday of an engineer was much less dramatic and therefore had less impact. The customers do save with better interfaces, though, and these savings presumably translate into a better reputation for the product and therefore eventually increase sales. Unfortunately, the effect of having increased usability lead to increased sales has mostly been documented only anecdotally. 3 In several cases, the relative usability of competing products is well known in the industry, and computer salespersons often recommend certain software packages on the basis of their usability. (Nielsen, 2019, 4)

Usability testing is still a relatively new field. The effectiveness of usability testing has not been adequately studied yet. There are several guidelines and ways for measuring usability. However, there is not much research data that talks about measuring usability. Nielsen guidelines are one of the best-known usability testing tools.

3.4 Methods in Usability

There are several different methods for usability testing. Usability can be considered throughout the whole design process, from the first sketch to the finished product. The product that I'm evaluating in this thesis, is almost ready. The actual users are already using it.

Usability is typically measured by having several test users (selected to be as representative as possible of the intended users) use the system to perform a prespecified set of tasks. However, it can also be measured by having real users in the field perform whatever tasks they are doing anyway. The important point is that usability is measured relative to particular users and certain tasks in either case. It could well be the case that the same system would be measured as having different usability characteristics if used by other users for various tasks. For example, a user wishing to write a letter may prefer a different word processor than a user wishing to maintain several hundred thousand pages of technical documentation. (Nielsen, 1994, 27)

According to Nielsen, there are four cheaper methods for testing usability. Scenarios are a method that breaks the software into pieces. These pieces can be modified easily. Scenarios can be created as paper mock-ups or created with prototyping tools.

Heuristic evaluation is done by professionals who have some understanding of the design guidelines. The software is evaluated by using an evaluation table for measurement.

The thinking-out load method is used with users that are real users of the product. They are given a set of tasks that they perform while the test observer follows them. They communicate with the observer throughout the test, explaining what they are doing while doing it.

The most straightforward way is simply observing the users using the product. Most common and apparent problems can be found this way.

Questionnaires and telephone interviews can be used to find apparent usability issues. (Nielsen, 1994, 3-20)

3.5 Usability testing tools

This thesis does not cover all the methods that can be used to measure usability. Usability should be the first and the last thing to consider in product design. The first draft of the product should be tested with real users. Testing should be done in every step of the product development lifecycle.

UX and UI design have multiple standards and guides that can be followed. The elements on the user interface are usually placed in a way that serves the customer's needs. The user group consisting of seniors and people with disabilities is a bit different than a normal user group. There are more detailed methods for measuring usability that could be used.

"Eye-tracking is a technique whereby an individual's eye movements are measured so that the researcher knows both where a person is looking at any given time and the sequence in which the person's eyes are shifting from one location to another. Tracking people's eye movements can help HCI researchers to understand visual and display-based information processing and the factors that may impact the usability of system interfaces. In this way, eye-movement recordings can provide an objective source of interface-evaluation data that can inform the design of improved interfaces. Eye movements also can be captured and used as control signals to enable people to interact with interfaces directly without the need for

mouse or keyboard input, which can be a major advantage for certain populations of users, such as disabled individuals.” (Poole, 2016, 1)

3.6 Challenges

Senior citizens might have bad eyesight. It might be difficult for them to look into the screen. Their gaze can focus on a very different point than the gaze of the normal user. Older users might not have a lot of experience with digital devices. They are used to different kinds of technology. When they look at the computer screen, they might look for something familiar to them. That something can be something other than what a normal user is looking for.

According to the study made in Austria in 2006 senior users are very different than younger users. They tested the ITV navigation application with two user groups. Elderly users (50 years and above) and users between 20-30 years. They used the ClearView eye-tracking tool. The tests were conducted in a lab. Each user was tested alone. The results indicated that the senior users were slower on viewing, searching, and finding behavior than younger people. Older people had trouble understanding the design of the navigation. Their gaze was not focused on the same place as younger users. (Obrist, Bernhaupt, Beck, Tscheligi, 2006)

According to Nielsen the first steps that the company should take when they are starting usability testing are 1. Recognize the need for testing, 2. Create a culture inside the company were making changes to improve usability is a good thing, 3. Use enough time and resources for usability testing, 4. Integrate usability testing as a part of the development process, 5. Make sure that all user interfaces are tested. (Nielsen, 1994, 21-22)

The usability testing starts with the idea "your best guess is not good enough". The product is designed for the user. Sometimes a design approach that seems to be the best idea, is not understandable to the user. Then again, a user is not a designer, they don’t always know what is best for them.

For example, Grudin and Barnard [1985] compared command abbreviations they defined with abbreviations defined by individual users and found that users made about twice as many errors when using their own abbreviations. Even when given the chance to redefine their abbreviations after the experiment, six of seven test users kept their poor abbreviation sets virtually intact, typically explaining that while yes, they had some problems with it, it seemed as good as any other set they could think of. Of course, users have other jobs and do not work as user interface professionals. (Nielsen, 1994, 13)

4 Yetihome

Any Yetihome is a 21.5 to 27-inch sized tablet. The operating system is android based. “The device is targeted for elderly homes and supported housing units.”(Kuori website)

The device has many features specially designed with its user in mind. One of these is the YetiMood-app, which can provide information on the general mood of the user. The device asks the user to choose a smiley face based on their current mood. If the user keeps choosing a sad face many times in a row, it can be a good time to check from the user that he or she is doing ok.

Yetihome has a home screen where mostly used apps are shown. Each customer can choose the apps they regularly use to be displayed on the home screen. Favorite newspaper, radio, video call, and favorite application can be displayed on the home screen.The video call function uses the Vooler application. The device also has a remote control function. Customer service can help the user remotely in problem situations.

Yeticare applications are designed to support the user’s ability to function and maintain their cognitive skills.

The device is built with an android build version. The company is currently in the process of getting its own certificate. Google has given them the right to apply for a certificate for their android system. From start to finish, the self-built operating system makes the device very safe. The company is responsible for writing the code, there are no outsiders involved in the process. They know the meaning of every line of code. No outsider input is used. The operating system is like tin. Closed system. Outsiders don’t have access to it. Companies’ competitors don’t make their operating systems from scratch. They use the lower version of android.

The Yetihome is already in use by less than ten users. These users are pilot users. The company is collecting experiences and feedback from these users. They can still make small changes based on the feedback from them. (Maria Jokelainen, 2021)

5 User Experiences

The competitors have started to find the market gap too. There are several similar products available.

GrandPad is a product available in the USA, Ireland, and the UK. It’s also an android based device. The size of the product is only 8 inches. This product is also used by seniors with bad

eyesight. The application icons on the home screen are big and colorful. They are displayed on a white screen which makes them pop. The device can be connected to a bigger screen such as tv. (Brandon, 2015)

Anyone who has good technical skills can build their own tablet. According to the article in "Tekniikan maailma" Ict-professional Ilpo Lehtola designed his own tablet:

"My solution was to put the grandfather's tablet firmly on the kitchen wall. The tablet is positioned so that when the grandfather is sitting in the usual place at the dining table, the grandfather can see the tablet and the callers can see the grandpa. Skype is set to auto-reply so you don't have to try to press the answer button yourself. "

"In addition, Skype is defined so that only people in its own address book can make calls. In Auto Answer mode, Skype does not Alert but connects the call directly. Because of that, sometimes you have to shout and ask grandpa to come to the kitchen, "Lehtola describes his system." (Tekniikan Maailma, 2021)

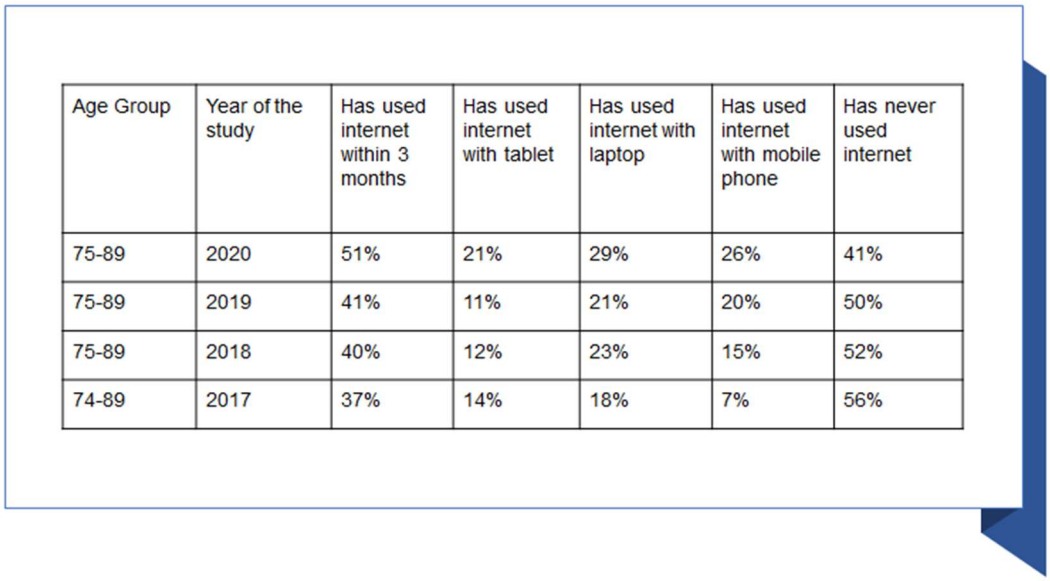
Elisa has a solution for senior users. The service includes a tablet, software, content creation system, and management tools. The device can be installed by a healthcare worker or relative. The device has a video connection application where you can add a picture of a family member. The senior can just push the button to make a call. Senior help is part of Elisa:s multiservice system that is designed for the social and healthcare sectors. This service system is in use at Hus Naistenklinikka patient hotel Perhospesä. The device has a chat function which is useful in healthcare. There are also several similar products available. These companies don't make their products from scratch. They use the operating system of some existing brands. One of these similar brands is the Finnish Lumo. There are also few phone brands available for people with bad eyesight. (Elisa, 2021)

6 Usability testing with the elderly focus group

Overall, the device is ready for its users already. In the future, this product and other similar products will make our lives safer and easier. In the future, a large group of people who are accustomed to technology will get older. These digital natives will demand more from their devices. However, at the moment there is still a large group of seniors who dont use technology in their evryday life.

Tilastokeskus collects data of the use of information technology and communications. They conduct a consumer survey each year.

Use of Information and communications technology by individuals/Statistics Finland (2021)



Age Group	Year of the study	Has used internet within 3 months	Has used internet with tablet	Has used internet with laptop	Has used internet with mobile phone	Has never used internet
75-89	2020	51%	21%	29%	26%	41%
75-89	2019	41%	11%	21%	20%	50%
75-89	2018	40%	12%	23%	15%	52%
74-89	2017	37%	14%	18%	7%	56%

Figure 1

Figure 1: Use of information and communications technology by individuals/Statistic (2021)

The use of the internet is coming more common in the group of older users. Each year the number gets bigger. This survey does not measure the internet use of people who are older than 89 years. Yetihome users can be even older than that. These people come from different backgrounds. They have disabilities such as dementia and bad eyesight. There can be big differences in the activity of individuals, even if they are the same age. You can find a 90-year-old that is curious and interested in technology and you can find a 90-year-old who is scared of computers. Usability testing with seniors is different than testing usability with normal users. The research metrics should be studied from the elderly perspective. We need to see the product with their eyes and ask the questions that they would ask. According to a study made by the Medical university Graz in Austria, the following questions can be used to identify metrics for usability testing with the elderly:

Question	Metric
Can I trust it?	How can passive technology be made more trustworthy?

Can I switch it off/on?	How can we make it more controllable?
Can I understand it?	How can we improve our understanding of the principles and functionality, without too many confusing details?
Will it obey me?	How can we make the device less scary?
Who can see me?	How can we replace the fear of being controlled with a feeling of being in control?
Do I really need this?	Explanation of benefits and purposes, appropriateness of measures taken.

Table 1: (Holzinger, Searle, Kleinberger, Seffah, Javahery, 2008)

The elderly user is not as used to technology as a younger user. A 90-year-old has used the computer for only half of their life. Millennial user has had a digital device in their hands since the day they were born. A 90-year-old might feel that they cant use a computer. They might think they should have some special knowledge of the device otherwise they might break it. If a person has never used a computer, it can be challenging for them to have an open mind towards a digital device. When someone is helping an elderly user with a device that is new to them, they need to be patient. They need to give the senior enough time to browse the device. They need to provide guidance and help, but they must let the person learn at their own pace. When usability is tested with elderly users, the test should be simple and easy to do. The test users should have enough time to complete the test. It's important to make sure that the elderly user understands that the purpose of the test is to test the device and not the user. They must understand that they are not alone, and they can get help anytime they need it. Elderly users might have more concerns than regular users. The test supervisor should have a lot of patience and enough time for the user. The elderly user needs to be seen as a person, not as a test user. You need to listen to them and encourage them.

"In conversation with an older adult, speak clearly but in a non-exaggerated fashion. Use short sentences; pause slightly after each statement to facilitate comprehension by listeners who rely on body language or other context cues to overcome hearing difficulties. Explicitly announce a new topic. If someone asks you to repeat what has been said, repeat once and then rephrase in a slightly different way. Ask questions to be sure you have been understood. Do not assume that a head nod signals complete understanding." (Farage, Miller, Ajayi, Hutchins, 2012)

A person might have an attitude that is impossible to change. They might think: I could never learn to use a computer, I'm so old. They might think I'm so old, I don't need to learn to use a computer anymore. Learning can be hard but it's not impossible.

This thesis focuses on the usability of the Yetihome devices. There are few pilot users that have been using the device. I used two techniques for collecting usability data from the users. Questionnaires and observing. I used a video recording of a pilot user using the device. The senior user was testing the Yetihome device. He was given some simple tasks to perform with the device. I also made a questionnaire for Yetitablet users to collect data. I made an analysis of these results and compared them with each other to find potential areas for further development. This thesis does not cover usability testing for the Yetitablet devices. The thesis focuses on the usability of the Yetihome device. These devices are being used by the same user group and they are built with the same android operating system. Yetitablet has been in use for years. It's easy to collect experiences from its users. These experiences can help in the development of the home version.

7 Interface Design

Interface design for elderly users has many things that need to be considered. A person who is over 60 years old has a different kind of eyesight than a young person. When people come older their pupils get smaller and less light enters the eye. Older people need more illumination to see clearly. However, the illumination can't be too bright, because it can cause scattering within the eye.

Color perception diminishes, especially in the violet-blue-green portion of the spectrum (Johnson, Adams, Twelker, & Quigg, 1988), such that vivid shades of color in the yellow to the red portion of the spectrum are more easily discerned. Consequently, older people discern and discriminate bright, warm colors more easily than cool ones (Wijk, Berg, Sivik, & Steen, 1999).

Older people move in a different way than young people. The perception of touch, pressure, and vibration declines with age, especially on the hands and feet. Lower sensitivity to pressure makes it is harder to sense when the body has made full contact with a surface (such being fully seated) or when a small surface (such as an elevator button or keyboard key) has been depressed. The decline in sensitivity to touch, pressure, and vibration becomes apparent by the fifth decade and progresses exponentially after age 65 or 70 (Bartlett et al., 1998; Hilz et al., 1998). The rate of decline differs by body site.

The desing should be flexible. It shoud adapt to the person's constraints and pace. It should be simple to use, it should provide feedback, clues, and prompts, to assist the person. (Farage, Miller, Ajaayi, Hutchins, 2012)

In the usability testing phase, I will try to find answers to following questions.

1. Visibility

- Is the screen bright enough?
- Can an elderly user turn the device on/off?
- Is the voice-over clear enough?
- Does the device give the senior user feedback and prompts?
- How is the navigation?

2. Accessibility

- Does the senior user understand the interface?
- Are the icons understandable for the senior user?
- Is it easy to use?
- Can an elderly user trust the device?
- Is the shape of the items on the screen clear enough?
- Is the design of the "home" screen clear for a senior user?

3. User Control

- Is it easy to get back to the home screen?
- Emergency exit?

4. Consistency

- Is the system unified? Is it easy to understand, what is the meaning of the icons and selections?

5. Error prevention

- Does the system give error messages or prompts for a user, so they know what they need to do next?
- Can you accidently remove something important?

6. Recognition rather than recall

- Does the interface make it clear for the user what they should do?
- Can a senior user understand what button they should press?

7. Flexibility

- Is it easy to modify the system?
- Can a user modify the home screen to meet their needs?

8. Minimalist Design

- Does the system contain parts that are unnecessary?

9. Features

- Is it easy for a user to find the application they want to use?
- Are the applications fun to use?
- Do senior users get a feeling of success with the device?

- Can a person who has never used technology, learn to use Yetitablet?

8 Usability tests

My own experience with Yetihome was positive. The first expression was that the operating system really feels simple and easy to use. When I tested the device, I made these observations:

Home Screen Selections

- I can only choose one newspaper and one radio channel. “Your favorite app” lets me choose more than one thing.
- The “safe” icon looks like a camera.
- the screen does not always respond to touch, the touch must be a certain kind.
- Is it possible to adjust the screen to another position? I wasn’t able to move it higher or lower.
- It’s possible that the senior accidentally goes to android settings and doesn’t know what to do.
- I keep clicking the clock sound button.
- Is the screen too dark?

Navigation

- If I choose to place the navigation bar to the right, it goes on top of the “navigation bar settings.”
- Draw anywhere function is good. I can imagine that on a bigger screen this function is good too. Companies and schools would definitely use that for presentations. The drawing function is simple and fun to use.

- Vooler app seems to be very useful and easy to us

To investigate usability, I conducted a survey for Yetitablet users. I asked about the features and functionality of the device. The company provided me with its customer register, which allowed me to contact the right users of the device.

I conducted the survey with email, using the google form tool. The purpose for this survey was to collect experiences from Yetitablet users. I wanted to compare the results from Yetitablet users to Yetihome users, if I could find some issues that are similar in both devices.

I was unable to get a lot of material from Yetihome pilot users. The covid-19 situation makes it hard to visit senior users. I used my own experience with the device and videos from one test user. The pilot launch has just begun so there is not so much material from actual users. The current situation makes it difficult to access equipment parts worldwide. For this reason, the device has not yet been passed on to very many users.

9 Final Analysis and recommodations

The questionnaire for Yetitablet users was sent to 30 companies that are currently using the device. Half of them answered. The first question in the survey asked them to rate the device's usability. 35.7% percent of the participants chose excellently, 50% chose well.

The second question asked them to explain their answer. The following responses were given: "The program/app you are looking for can be easily found as long as the internet connection is working."

"The Yeti tablet is used in the memory unit daily with various functions. Its wide range of uses allows for daily use. Increases community in the memory unit and serves as a good tool for stimulus sessions."

"Easy, logical, we just started using."

“The big size is good

only the imagination is the limit of what it can do.”

“The "legs" of the stand if they could be spread out so that the wheelchair could get closer.”

The third question asked: do tenants use the device actively?

42.9% of the users said they use the device daily, 14.3% said they use it a few times a week, 21,4% a few times a month, and 21.4% said they never use it. Only 7.7% of the users use the device independently without any help from nurses or assistants. The next question was: which of the following best defines the use of Yetitablet? 53.8% said that the device helps to maintain the cognitive abilities of the elderly. All of the participants(100%) said that the device brightened the day. The sixth question was about the size and brightness of the screen. Most of the answers indicated that users are satisfied with these features.

The next question was, “How can we make the product better?”

Most of the answers were about the poor sound quality. The device does not make enough sound. Users need to use extra speakers. One of the answers suggested that the device would have an artificial intelligence feature that could communicate with users. The company is interested in developing this feature in the future.

Caregivers usually are responsible for guiding older people with the device. They need more ideas and guidance to take full advantage of the device. In the open feedback field, customers suggested that the company could provide additional courses for using Yetitablet.

The following answers were given: What do you do with the device?

“Used daily in our activities, played games, read magazines, used for memory rehabilitation.”...

“Morning opening, quiz, drawing, memory applications, music, watching general arena affairs, memory games”

“Singing karaoke, watching worship, watching programs, exercising.”

“Among other things, we look at old familiar programs from Yle Arena, which are even more familiar to our residents, and discuss them together. Let's play, remember, listen to music, identify the places where residents have lived or where they would like to travel (imagination trips) through google earth. ”

“We often watch programs from Yle Areena and favorite music from the people on YouTube. Various games are popular, and Memory Park is also used.”

“In the background, for example, a fireplace or a Metsäpuro landscape from YouTube, playing and quizzes in a group session.”

The YetiHome device usability was tested by observing the machine and watching videos of the test user using the device. The overall feeling from Yetohome was that it’s good enough as it is. The device can be beneficial for older people at home. Some users might have preconceptions about using the device. The device is so easy to use that even a person who has not used technology before could learn to use it.

The following things could be considered in future development:

1. The device menus are a bit confusing. The menus could have clear divisions, more separate menus. The structure of the Menus could be more user-friendly and the text font bigger.

2. The home screen could have a white background color. There is an example photo of this in the last page of this thesis. The Yetitablet has a bigger screen than Yetihome. The darker

screen works better on a big screen. Yetihome screen seemed too dark for the test user with bad eyesight.

3. My suggestion for the navigation bar is that it would just simply be at the bottom of the screen.

4. The eye-tracking technique could be used to test usability.

5. There could be more ways to adjust the screen.

6. More guidance, online courses, and usage tips for users.

10 Yetitablet Survey Questions

In the survey, I asked questions regarding e.g. the screen size and brightness of the device, the uses of the device, experiences, and the need for the device. I take care of the anonymity of the respondents during the survey. No responses from any individual respondent will appear in the survey, I have not provided the addresses or emails of the respondents to anyone outside the company. The survey was conducted in Finnish.

11 Conclusions

The objectives of my thesis were 1. Provide an outsider's view. 2. Identify issues that still need improvement, and 3. Give ideas for design development process. I was able to meet my objectives. I succeeded in bringing an outside perspective to product development. However, many of my observations are already clear to the customer. I hope I was able to come up with some ideas that will be useful in further development. The current world situation has had its effects on my thesis writing process. It took some time to find a good topic. Time management was challenging. It was hard to fit schedules together with the company representatives. My thesis could have been more comprehensive and extensive. My work does not go very deep into the device's technical features. At some point, however, the process must end. I have found areas for future improvement and made my suggestions for how to develop them further.

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Figures

Tables

Appendices

Appendix 1: Usability test results

0 = No usability issues/Good Design thinking

1 = Small Usability Issue

2 = Issue that needs attention

3 = Major design flaw

Issue number	The part of the System	The Issue	The gravity of the Issue	Test User number	Possible Solutions	Good Design features
1	The “safe” icon looks like a camera	The icon does not represent the thing it’s supposed to do	1	1	Ask users what symbols would be understandable to them.	
2	The Screen does not always respond to touch, and the touch should be a certain kind	Older people might struggle to touch the screen the right way	1	1,2	Adjusting the screen to react more sensitive to contact	
3	The color of the “Home” screen is quite dark	Is the screen too dark?	2	1,2	The screen background color could be white.	
4	The Vooler app is going to be a valuable tool in the future.		0	1		Could the app open itself?
5	Drawing function		0	1		This function could be helpful in the business world or education.

6	The navigation bar	navigation bar goes on top of things	3		The navigation bar at the bottom of the screen	

Appendix 2: Usability tests results

Issue number	The part of the System	The Issue	The gravity of the Issue	Test User number	Possible Solutions	Good Design features
7	Navigation	Senior user is looking for navigation buttons from the bottom of the screen	2	2	The navigation bar at the bottom of the screen?	
8	Home Screen	The home screen is too dark for users that have lousy eye-sight	1	2		
9	Home Screen	Voice-over function in the home screen button	0	2		Useful for users with lousy ey-sight, easy to use
10	Buttons	Clear buttons on the white screen are more visible to elderly users	0	2		
11	The Device	Games and apps activate elderly users	0	2		The senior user gets experiences of success with the device.
12	The Device	The device can be beneficial for an older adults who are already familiar with technology	0	2	An older adult who is unfamiliar with the technology needs a lot of help using the device.	

Issue number	The part of the System	The Issue	The gravity of the Issue	% of the answers	Possible Solutions	Good Design features	The Device: Yetitablet
1	Screen	Screen size and brightness	0	100%		The size and brightness of the screen suit the users.	
2	Android system	The android system is too complicated; problem-solving takes a lot of time	0	12,5%	More system usage training		
3	The device	Sound quality	0	40%	Improving the good quality in new devices		
4	The device	The device can be scary for seniors	0		More training for nurses and assistants		
5	The device	Movable legs for the device	0		There should be options for moving the device		

Appendix 3: Usability Survey

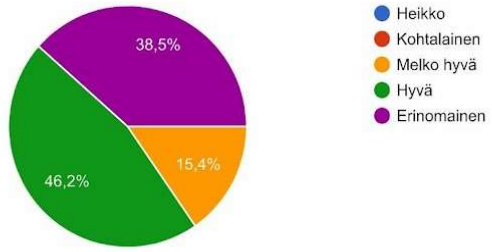
Yetitablet Käyttäjäkysely

13 vastausta

Julkaise tiedot

Minkä arvosanan antaisit Yetitabletin käytettävyydestä?

13 vastausta



Voit halutessasi perustella antamaasi arvosanaa:

5 vastausta

vain mielikuvitus on rajana, mitä kaikkea sillä voi tehdä.

Yeti -tabletti on käytössä muistiyksikössä joka päivä erilaisine toimintoineen. Sen laajat käyttömahdollisuudet mahdollistavat päivittäisen käytön. Lisää yhteisöllisyyttä muistiyksikössä ja toimii hyvänä työkaluna viriketuokioissa.

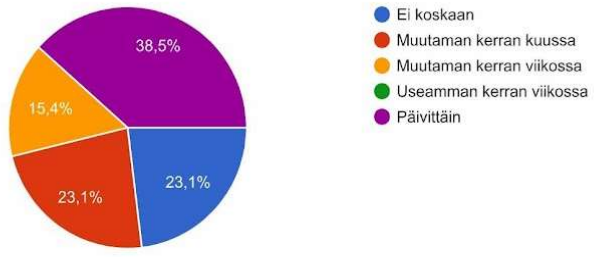
Telineen " jalkoja" jos saisi levitettyä niin että pyörätuolilla pääsisi paremmin lähelle.Varsinkin jos on 2 p- tuolia ne ei mahdu kunnolla

Haettava ohjelma / appi löytyy helposti, kunhan nettiyhteys toimii

Helppo, looginen, käyttö on vasta alussa

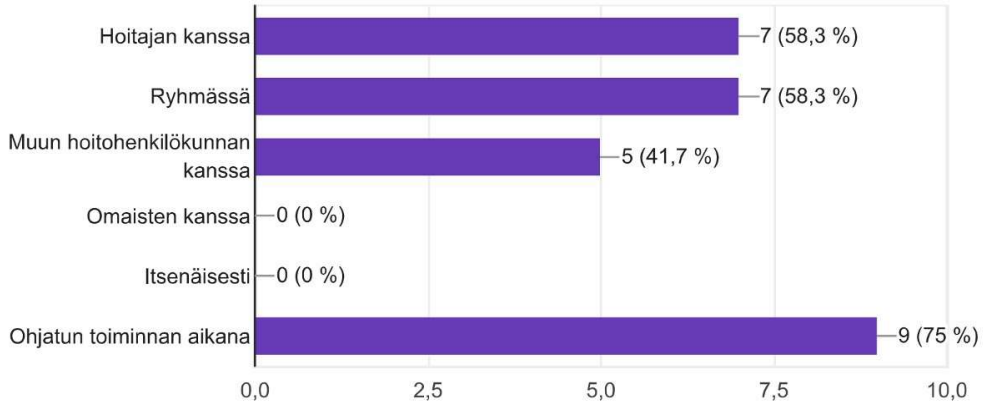
Käyttävätkö asukkaat laitetta aktiivisesti?

13 vastausta



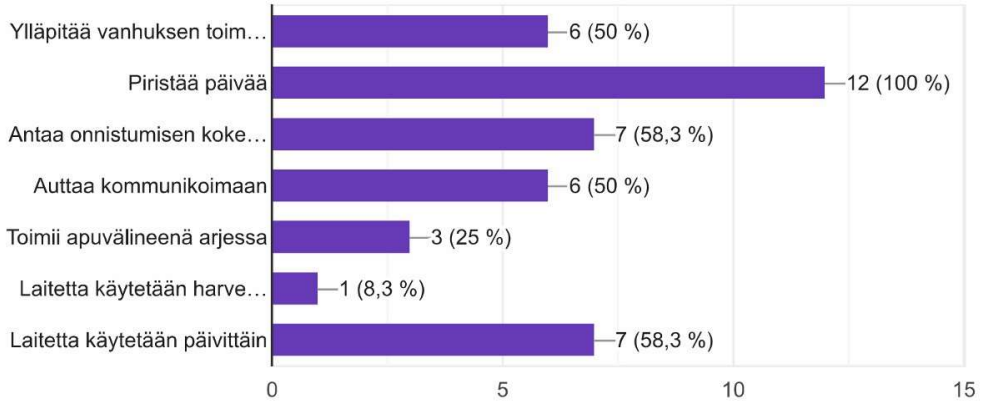
Käyttävätkö ikäihmiset laitetta useimmiten:

12 vastausta



Mitkä seuraavista väittämistä kuvaavat parhaiten laitteen käyttöä:

12 vastausta



Onko näytön koko ja kirkkaus sopiva asiakkaille?

12 vastausta

kyllä

Kyllä

Laitteen koko on juuri sopiva.

Kyllä mutta laitteen oma äänentoisto on heikko.Tarvitsee heikkokuuloisille vanhuksille ulkopuolisen kaiuttimen.

Näyttö voisi olla isompi, mutta muuten ok.

on

On

Kokemuksen mukaan kyllä

käytetään päivittäin meidän toiminnassa, pelataan pelejä, luetaan lehtiä,käytetääm muistikuntoutuksessa...

aamunavaus, tietovisaa, piirtämistä, muistisovelluksia, musiikkia, katsellaan yle areenan asiaohjelmia, muistipelit,

lauletaan karaokea, seurataan jumalanpalveluksia, katsotaan ohjelmia, jumpataan

mm. katsotaan Yle -areenasta vanhoja tuttuja ohjelmia, mitkä ovat meidän asukkaille entisestään tuttuja ja keskustellaan niistä yhdessä. Pelataan, muistellaan, kuunnellaan musiikkia, google earth kautta tunnistetaan asuinpaikkoja, missä asukkaat ovat asuneet tai minne haluaisi vielä matkustaa (mielikuva matkoja).

Pelataan pelejä ja kuunnellaan musiikia ja katsotaan elokuvia

Harjoitellaan kirjaimia ja numeroita esikoululaisten kanssa.

Useasti katsomme Yle Areenasta ohjelmia ja You Tubesta asukkaiden

Kuinka voisimme vielä kehittää tuotetta paremmaksi?

8 vastausta

Laitteen äänentoisto on todella huono. Lisäkaiutin on lähes välttämätön.

äänen toisto ei riitä ilman lisäkaiuttimia huonokuuloisille vanhuksille

Android käyttöjärjestelmä on monelle vaikea ja monimutkainen. Ongelmatilanteissa asian selvittäminen on usein aikaa vievää ja vie paljon turhaa työaikaa.

Avattavat jalakset.Parempi laitteen äänentoistoa.

Nyt ei tule mieleen..

Nettiyhteys on hidas

Voiko sitä saada kommunikoimaan?

Mitä muuta palautetta haluaisit antaa?

4 vastausta

toivoisimme, että joka yksikkö ymmärtäisi Yeti -tabletin monipuolisuuden ja hyödyn, jotta ottaisi sen käyttöön yksiköissä. Tässä kunnassa on myös toisessa asumispalveluyksikössä Yeti -tabletti käytössä sekä päivätoiminnassa yksi. Yeti tabletin monipuolisuus ja esim. muistiohjelmien tai musiikin käyttö nostaa muistisairaiden omanarvon tuntoa, saa hymyn kasvoille ja tunnemuistiin hyvänolon tunteen ja vähentää mm. aggressiivisuutta, levottomuutta, itkuisuutta ja pelkoa. Kun sanoja ei enää ole, löytyy mm. musiikin avulla rytmi ja hyvänolon tunne (tunnemuisti), joka kestää pitkälle päivään ja vaikuttaa jopa yöuneen levollisesti. Pitää muistaa, että hoitajien tulee sitoutua Yeti -tabletin käyttöön. Jos se on nurkassa ns. koristeena siitä ei ole hyötyä. Hoitajien uskallus käyttää Yeti -tablettia monipuolisesti auttaa asukkaita viihtymisessä ja elämänlaadun kohentumisessa. Terveiset yhdeltä asukkaalta seuraavin sanoin "Tänään haluaisin kuunnella Mikko Alataloa" :)

Omalta osaltani yritän aktivoida ikäihmisiä enemmän käyttämään sitä myös itse eikä vain katsomaan. Ei ole toteutunut vielä.

Koulutuksia kaivataan. Moni pelkää Jetin käyttöä turhaan

Uusi ia ihmeellinen rvhmäläisille. Ovat tvkänneet kun isolta nävtöltä helDD0 seurata.

Yetitablet Käyttäjäkysely

Kyselyn vastauksia käytetään opinnäytetyön aineistona. Vastauksista tehdään koontiyhteenveto. Vastaajan henkilötietoja ei yhdistetä vastauksiin. Kyselyyn voi vastata kuka tahansa henkilökunnan jäsen joka työskentelee ikäihmisten parissa.

1. Minkä arvosanan antaisit Yetitabletin käytettävyydestä?

   Merkitse vain yksi soikio.

   - ◯ Heikko
   - ◯ Kohtalainen
   - ◯ Melko hyvä
   - ◯ Hyvä
   - ◯ Erinomainen

2. Voit halutessasi perustella antamaasi arvosanaa:

3. Käyttävätkö asukkaat laitetta aktiivisesti?

   Merkitse vain yksi soikio.

   - ◯ Ei koskaan
   - ◯ Muutaman kerran kuussa
   - ◯ Muutaman kerran viikossa
   - ◯ Useamman kerran viikossa
   - ◯ Päivittäin

4. Käyttävätkö ikäihmiset laitetta useimmiten:

Valitse kaikki sopivat vaihtoehdot.

- [ ] Hoitajan kanssa
- [ ] Ryhmässä
- [ ] Muun hoitohenkilökunnan kanssa
- [ ] Omaisten kanssa
- [ ] Itsenäisesti
- [ ] Ohjatun toiminnan aikana

16.11.2021 22.50

6. Onko näytön koko ja kirkkaus sopiva asiakkaille?

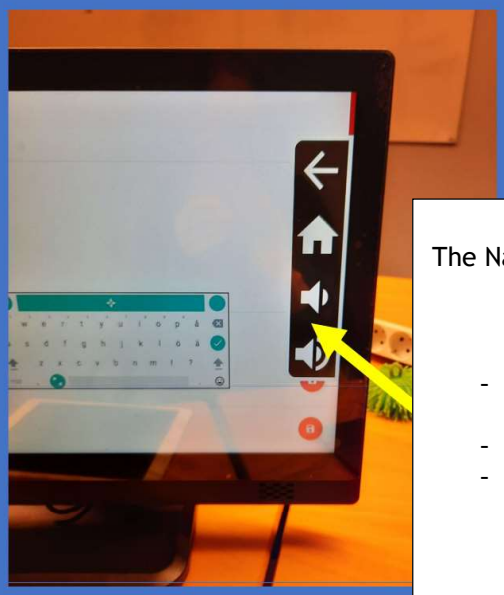
5. Mitkä seuraavista väittämistä kuvaavat parhaiten laitteen käyttöä:

Valitse kaikki sopivat vaihtoehdot.

- [ ] Ylläpitää vanhuksen toimintakykyä
- [ ] Piristää päivää
- [ ] Antaa onnistumisen kokemuksia ikäihmiselle
- [ ] Auttaa kommunikoimaan
- [ ] Toimii apuvälineenä arjessa
- [ ] Laitetta käytetään harvemmin
- [ ] Laitetta käytetään päivittäin

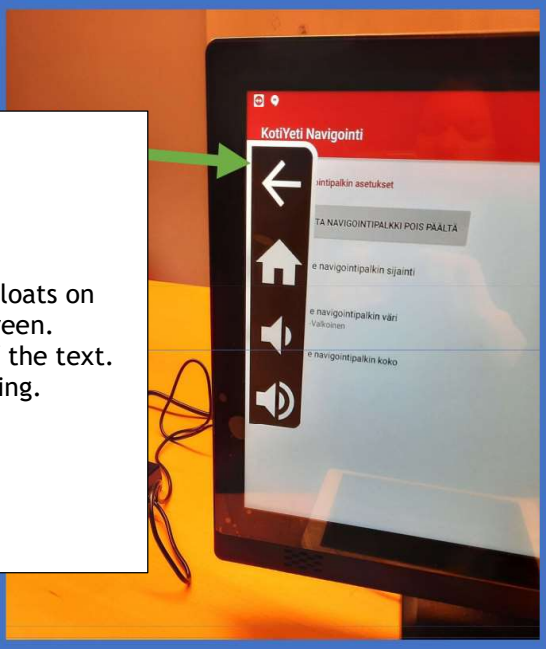
7. Mitä asioita laitteella tehdään?

Appendix 4: Improvement ideas



The Navigation panel

- The current navigation panel floats on the left or right side of the screen.
- The navigation goes ton top of the text.
- Navigation settings are confucing.



There were two issues where the company still needs to improve the device. Navigation bar and the color of the home screen. The following image on the next page: is an idea of the home screen that is designed based on the observations I made during this study.

Senior users were looking the navigation panel on the bottom of the screen. Instead of icons the panel could have verbal selection that could be customized to users needs. Users could choose a color that best indicates “Home” screen to them.