

APPENDIX A.



1. Life. Being able to live to the end of a human life of normal length; not dying prematurely, or before one's life is so reduced as to be not worth living.

2. Bodily Health. Being able to have good health, including reproductive health; to be adequately nourished; to have adequate shelter.

3. Bodily Integrity. Being able to move freely from place to place; to be secure against violent assault, including sexual assault and domestic violence; having opportunities for sexual satisfaction and for choice in matters of reproduction.

4. Senses, Imagination, and Thought. Being able to use the senses, to imagine, think, and reason—and to do these things in a “truly human” way, a way informed and cultivated by an adequate education, including, but by no means limited to, literacy and basic mathematical and scientific training. Being able to use imagination and thought in connection with experiencing and producing works and events of one's own choice, religious, literary, musical, and so forth. Being able to use one's mind in ways protected by guarantees of freedom of expression with respect to both political and artistic speech, and freedom of religious exercise. Being able to have pleasurable experiences and to avoid nonbeneficial pain.

5. Emotions. Being able to have attachments to things and people outside ourselves; to love those who love and care for us, to grieve at their absence; in general, to love, to grieve, to experience longing, gratitude, and justified anger. Not having one's emotional development blighted by fear and anxiety. (Supporting this capability means supporting forms of human association that can be shown to be crucial in their development.)

6. Practical Reason. Being able to form a conception of the good and to engage in critical reflection about the planning of one's life. (This entails protection for the liberty of conscience and religious observance.)

7. Affiliation.

A. Being able to live with and toward others, to recognize and show concern for other human beings, to engage in various forms of social interaction; to be able to imagine the situation of another. (Protecting this capability means protecting institutions that constitute and nourish such forms of affiliation, and also protecting the freedom of assembly and political

speech.)

B. Having the social bases of self-respect and nonhumiliation; being able to be treated as a dignified being whose worth is equal to that of others. This entails provisions of nondiscrimination on the basis of race, sex, sexual orientation, ethnicity, caste, religion, national origin.

8. Other Species. Being able to live with concern for and in relation to animals, plants, and the world of nature.

9. Play. Being able to laugh, to play, to enjoy recreational activities.

10. Control over One's Environment.

A. Political. Being able to participate effectively in political choices that govern one's life; having the right of political participation, protections of free speech and association.

B. Material. Being able to hold property (both land and movable goods), and having property rights on an equal basis with others; having the right to seek employment on an equal basis with others; having the freedom from unwarranted search and seizure. In work, being able to work as a human being, exercising practical reason and entering into meaningful relationships of mutual recognition with other workers.

APPENDIX B.

B

1

Please recall the time you spent with your grandma or grandpa and share your memories. You can also share by answering the following questions.

- How often do you go visiting your grandma/grandpa? Or have you lived together for a long period of time?
- What activities do you usually do together?

Please introduce your name and your memories.

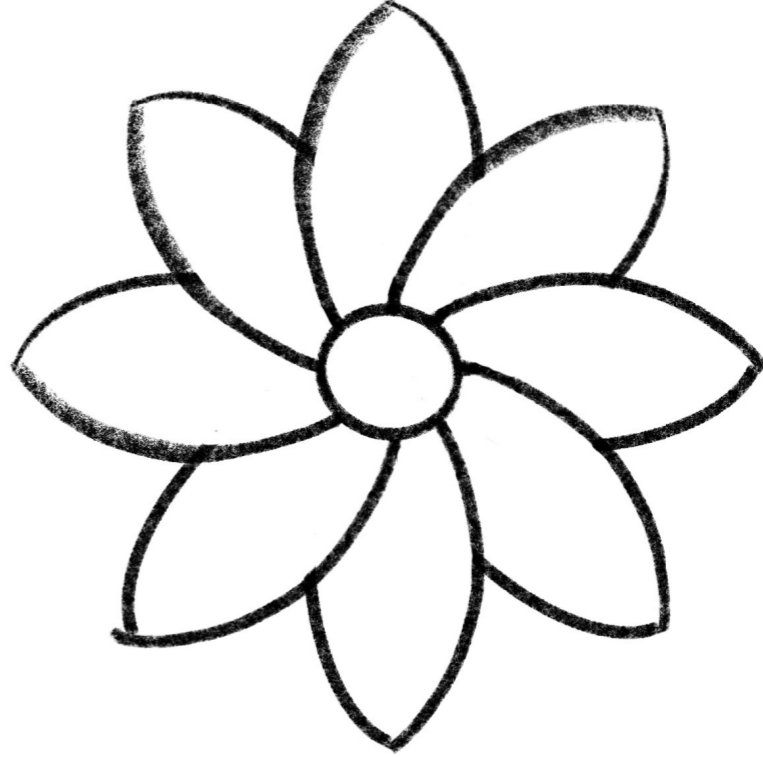
2

- Write down 8 adjectives that you think the **mainstream society** thinks of ageing or the elderly on the 1st flower (they probably are the words first coming to your mind when seeing this topic)

- Then write down the corresponding **antonyms** on the 2nd flower

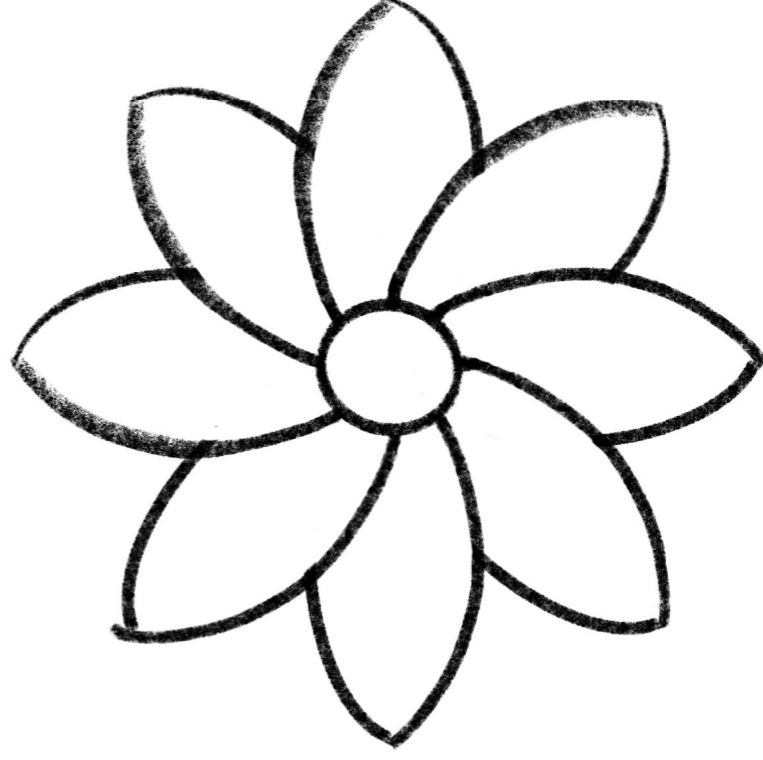
- Pick 2 antonyms and try to **associate** them with ageing or elderly people by thinking of **examples/scenarios**

In 5 min, please share your antonyms with the examples or scenarios.



Associative Flower

Antonym 1:
Associations:



Reverse Associative Flower

Antonym 2:
Associations:

Now you will see **10 central capabilities (Nussbaum, 2006)**
Please read the definition on the left carefully
You can complete the following exercises by recalling
your experiences with your grandma/grandpa or by
imagining when you are old

Capable or not

Yes
No
Partly Yes (No)

*You can underline the parts
you feel capable of

Yes
No
Partly Yes (No)

*You can underline the parts
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- Whether they (or the imaginary elderly you) are able to
achieve this capability
- In the 1st column: write down the related scenarios

(In)Capable Scenarios

- Whether they (or the imaginary elderly you) are able to
achieve this capability
- In the 1st column: write down the related scenarios

(In)Capable Scenarios

- In the 2nd column:
(If the answer is yes) write down the approaches they
(or imaginary you) use to strengthen this capability
(If the answer is no) write down how you want to
support them/how you want to be supported

Strengthening Approaches/External Support

- In the 2nd column:
(If the answer is yes) write down the approaches they
(or imaginary you) use to strengthen this capability
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Strengthening Approaches/External Support

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 You can complete the following exercises by recalling
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 imagining when you are old

Emotion

Being able to have attachments to things and people outside ourselves; to love those who love and care for us, to grieve at their absence; in general, to love, to grieve, to experience longing, gratitude, and justified anger. Not having one's emotional development blighted by fear and anxiety. (Supporting this capability means supporting forms of human association that can be shown to be crucial in their development.)

Being able to have attachments to things and people outside ourselves; to love those who love and care for us, to grieve at their absence; in general, to love, to grieve, to experience longing, gratitude, and justified anger. Not having one's emotional development blighted by fear and anxiety. (Supporting this capability means supporting forms of human association that can be shown to be crucial in their development.)

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 imagining when you are old

Practical Reason

Being able to form a conception of the good and to engage in critical reflection about the planning of one's life.

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 - In the 1st column: write down the related scenarios

(In)Capable Scenarios

Strengthening Approaches/External Support

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(In)Capable Scenarios

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- Whether they (or the imaginary elderly you) are able to achieve this capability
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Affiliation

A. Being able to live with and toward others, to recognize and show concern for other human beings, to engage in various forms of social interaction; to be able to imagine the situation of another.
B. Having the social bases of self-respect and nonhumiliation; being able to be treated as a dignified being whose worth is equal to that of others. This entails provisions of nondiscrimination on the basis of race, sex, sexual orientation, ethnicity, caste, religion, national origin.

A. Being able to live with and toward others, to recognize and show concern for other human beings; to engage in various forms of social interaction; to be able to imagine the situation of another.
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Other Species

Being able to live with concern for and in relation to animals, plants, and the world of nature.

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Strengthening Approaches/External Support

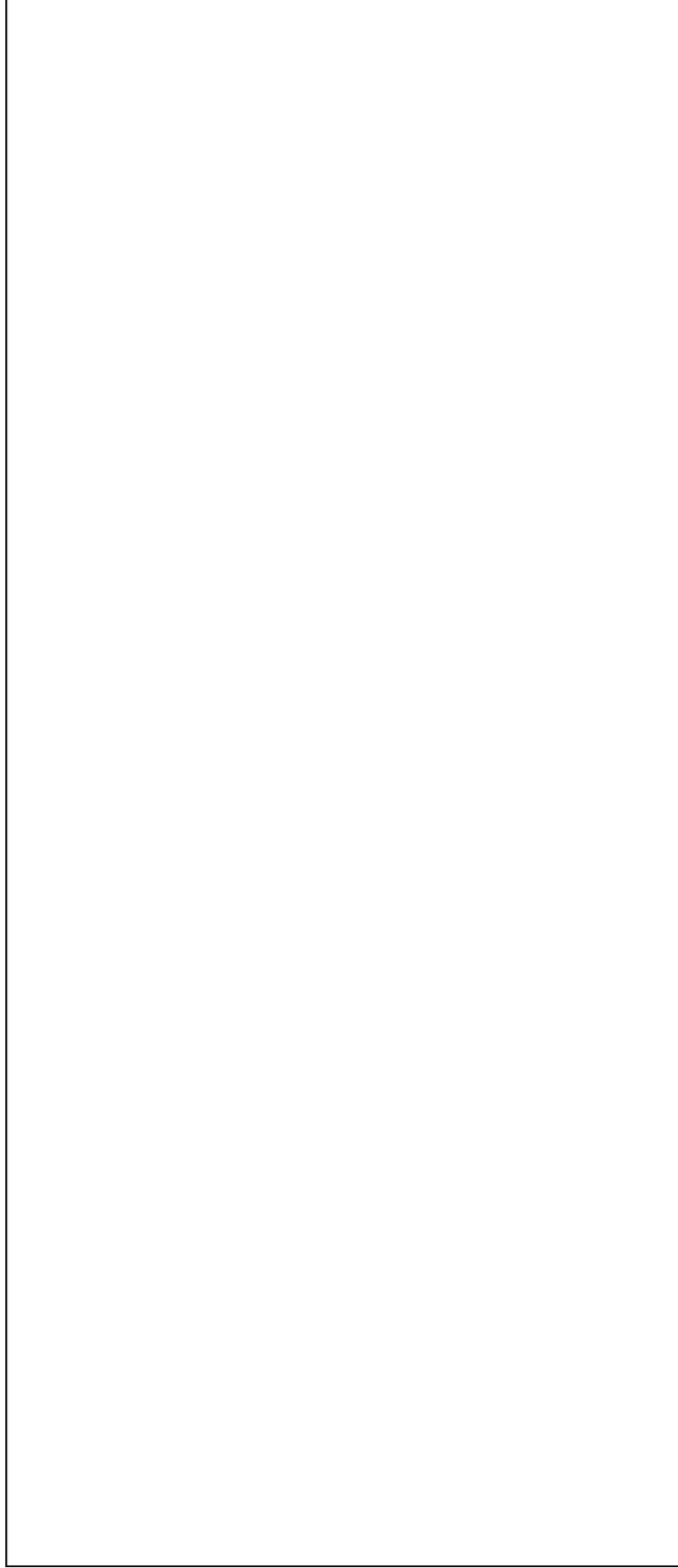
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Strengthening Approaches/External Support

4

Imagine your ideal way of ageing and write down a sentence or some adjectives or just doodle something to describe it.

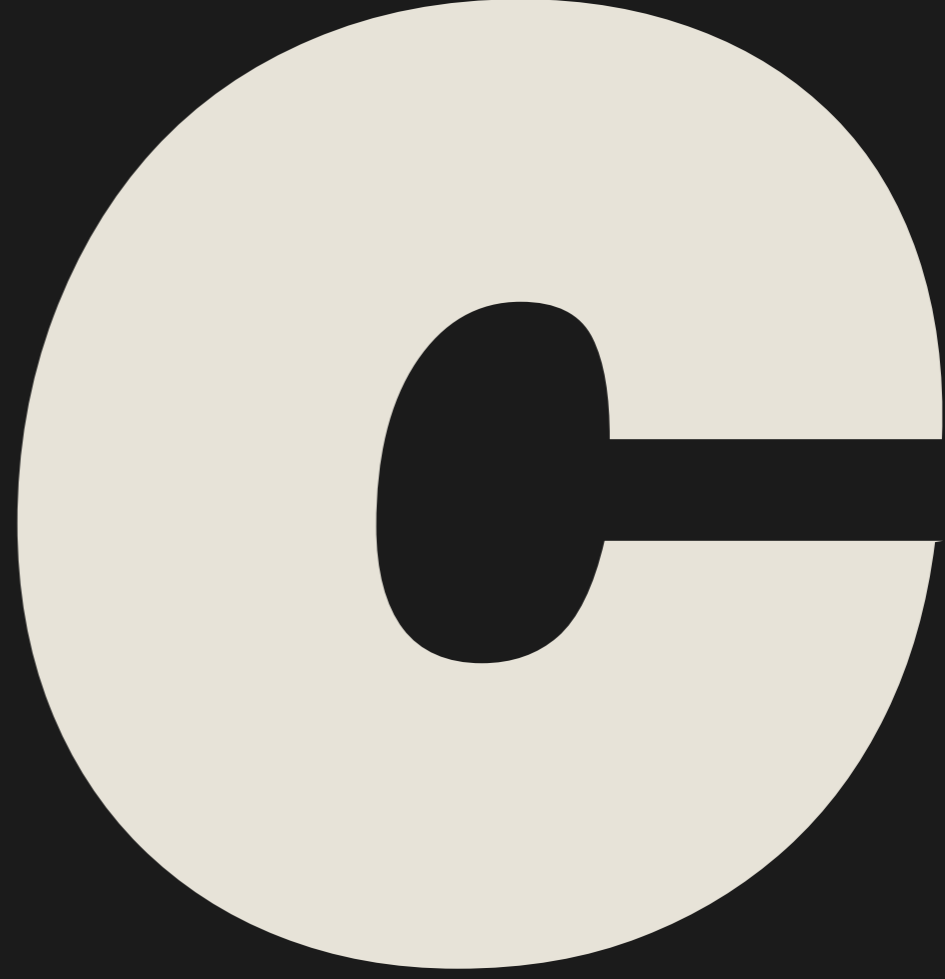
In 5 min, we will end this workshop.



Thanks for your attending! Do you have any questions to ask? Or you can also express your feeling about this session.



APPENDIX C.



How you will use 10 central capabilities (Nussbaum, 2006)		Whether they (or the imaginary elderly you) are able to achieve this capability		In the 2nd column (if the answer is yes) write down the approaches they (or imaginary you) use to strengthen this capability (if the answer is no) write down how you want to support them/how you want to be supported	
Affiliation	Capable or not	(In)Capable Scenarios	Strengthening Approaches/External Support	3	
A. Being able to live with and toward others, to cooperate and show concern for their human bonds, to engage in various forms of social interaction, to take on the duties of citizenship.	Yes No Partly Yes (No)	→ Interactions with friends (routine activities) → family - playing w/ kids, chatting w/ relatives, cooking w/ family, etc. → Experiences and life eqpt. elderly with self-respect, though social, cultural affect this → Communities to strengthen own discrimination	- Elderly may be supported w/ exposure to more interactions - in the neighborhood, city (unfamiliar) to empathic.		
A. Being able to live with and toward others, to cooperate and show concern for their human bonds, to engage in various forms of social interaction, to take on the duties of citizenship.	Yes No Partly Yes (No)	→ I think I will have enough experience to be able to understand that everyone is different but we're all human. → will involve in social interaction but maybe not for long.	→ more social events/activities to support different interests from elderly people. → Being/ involving th in the situation of today to understand what's going on		
A. Being able to live with and toward others, to cooperate and show concern for their human bonds, to engage in various forms of social interaction, to take on the duties of citizenship.	Yes No Partly Yes (No)	→ I hope I will be around people I can care for and feel needed to. → I do think elderly people in western countries are not always treated in dignified way. Their beliefs are not prioritized.	→ living in tight communities where I can help others and have people to relate to. → More etc moving with complex and interesting elderly characters.		
A. Being able to live with and toward others, to cooperate and show concern for their human bonds, to engage in various forms of social interaction, to take on the duties of citizenship.	Yes No Partly Yes (No)	Always think of everyone is different treat others in a way I would be happy to be treated with. listen to other people. spend less time on fake relationships, but be true to everyone	→ try some meditation, try some initiators, learn to reflect... be open to new things. also society needs to reduce stereotypes		
A. Being able to live with and toward others, to cooperate and show concern for their human bonds, to engage in various forms of social interaction, to take on the duties of citizenship.	Yes No Partly Yes (No)	A. → I think I will be more capable for that. B.	Maybe share etc with other elderly people, young people. Can be more patient with elderly people.		

How you will use 10 central capabilities (Nussbaum, 2006)		Whether they (or the imaginary elderly you) are able to achieve this capability		In the 2nd column (if the answer is yes) write down the approaches they (or imaginary you) use to strengthen this capability (if the answer is no) write down how you want to support them/how you want to be supported	
Control Over One's Environment	Capable or not	(In)Capable Scenarios	Strengthening Approaches/External Support	3	
A. Political: Being able to participate effectively in political choices that govern one's life, having the right to political participation, protection of free speech and association.	Yes No Partly Yes (No)	→ Political participation may often be hindered by lack of interest, motivation or exposure to effective news channels. → National rights are highly dependent on their place, residence & governing laws	→ Increased awareness (tech?) (community?) of on-going political situations. → laws to protect rights of the elderly		
A. Political: Being able to participate effectively in political choices that govern one's life, having the right to political participation, protection of free speech and association.	Yes No Partly Yes (No)	A. A lot of politicians are old, am not B. That is one man's basic right.	Some support for them (like Constant's sons), etc and tools or techniques to make up for their weakness		
A. Political: Being able to participate effectively in political choices that govern one's life, having the right to political participation, protection of free speech and association.	Yes No Partly Yes (No)	capable: property th can be well protected. incapable: employment. I'm not sure I can still be waited for a job that I have to do. political depends also on nation	→ knowledge parents, laws can help, can have lawyers for minorities. → maybe elderly people can also have initiators, so they can work in their own paces.		
A. Political: Being able to participate effectively in political choices that govern one's life, having the right to political participation, protection of free speech and association.	Yes No Partly Yes (No)	→ can still vote & participate. But my 10 years might not be listened to as much. → property: can still own stuff → employment: people don't expect me to work. might be perceived as slower but	Microphone to make my voice under A company for elderly.		
A. Political: Being able to participate effectively in political choices that govern one's life, having the right to political participation, protection of free speech and association.	Yes No Partly Yes (No)	→ I don't think there will be people stop elderly from participating in voting. → property, employment, and basic needs is for everyone.	- do not stop them from participating - inclusive community - provide basic needs for everyone		

How you will use 10 central capabilities (Nussbaum, 2006)		Whether they (or the imaginary elderly you) are able to achieve this capability		In the 2nd column (if the answer is yes) write down the approaches they (or imaginary you) use to strengthen this capability (if the answer is no) write down how you want to support them/how you want to be supported	
Practical Reason	Capable or not	(In)Capable Scenarios	Strengthening Approaches/External Support	3	
Being able to have a conception of the good and to engage in rational reflection about the planning of one's life.	Yes No Partly Yes (No)	When I am young old, I will have more health and experience, but I will reach reading slow and have less focus intelligence so fully yes.	→ Brainy like teenager, coming or to hands, passed what I talked about, not now, and helps to sort out my mind		
Being able to have a conception of the good and to engage in rational reflection about the planning of one's life.	Yes No Partly Yes (No)	incapable: form "a" is hard. I have too many, therefore sometimes too many anxiety. capable: reflection	→ incapable: maybe I should think less and sometimes just follow the most wanted, reduce desire → capable: learn about a lot reflection, keep journals to help reflect		
Being able to have a conception of the good and to engage in rational reflection about the planning of one's life.	Yes No Partly Yes (No)	Imagine myself, I can think of the good life but I want to have and make plan for that but to reflect, I think it's going to be tough because I might not want to critique my life when I'm old	→ Have something to look forward to, have some need or wants, then work for it but there can be external support for that. → Do I need to reflect on my life when I'm old? maybe I just want to share experience		
Being able to have a conception of the good and to engage in rational reflection about the planning of one's life.	Yes No Partly Yes (No)	Having followed a certain specific way of doing, may hinder critical reflection. Additionally, conception of good may be rigid based on only personal experience	→ Access to and exposure to multiple and varied interactions - encourage conversations with other people from diverse demographics		
Being able to have a conception of the good and to engage in rational reflection about the planning of one's life.	Yes No Partly Yes (No)	Critical reflection + planning of one's life might be largely influenced by systems in place and family members.	→ A system to plan and have control over my aging process + death before I am really old. → 60-70 years old → Different elderly means for different types of death.		

How you will use 10 central capabilities (Nussbaum, 2006)		Whether they (or the imaginary elderly you) are able to achieve this capability		In the 2nd column (if the answer is yes) write down the approaches they (or imaginary you) use to strengthen this capability (if the answer is no) write down how you want to support them/how you want to be supported	
Play	Capable or not	(In)Capable Scenarios	Strengthening Approaches/External Support	3	
Being able to have, to plan, to enjoy recreational activities.	Yes No Partly Yes (No)	having more time/resources to experience. incapable: maybe some activities are dangerous to elderly people	→ search for fun things to try, and go for it. → rationalise why is it dangerous? then each elderly person can judge by himself		
Being able to have, to plan, to enjoy recreational activities.	Yes No Partly Yes (No)	Not all activities are suitable for old people. Like roller coaster.	→ some VA equipment? To make them "experience" the activities that they can't really experience		
Being able to have, to plan, to enjoy recreational activities.	Yes No Partly Yes (No)	capable: elderly especially engage in playful, recreational activities w/ friends, families and grandkids. → Physical ailments may prevent so.	→ frequent meet-ups of those they can have fun with - picnics w/ families → Regular activities of friends - card game at the club.		
Being able to have, to plan, to enjoy recreational activities.	Yes No Partly Yes (No)	only for activities that my body doesn't allow me to play it myself, but I can still enjoy watching others doing it or just talking about it.	more inclusive recreational activity or space to watch others doing it		
Being able to have, to plan, to enjoy recreational activities.	Yes No Partly Yes (No)	→ Might have to change recreational activities. Not as many available for elderly. → Opportunity to learn something new!	Tai chi in Norway outside → Not much goes on outside in parks Outdoor games for elderly.		

Now you will use 10 central capabilities (Nussbaum, 2006)		Whether they (or the imaginary elderly you) are able to achieve this capability	
Please read the definition on the left carefully. You can complete the following exercises by recalling your experiences with your grandpa/grandpa or by imagining when you are old.		In the 2nd column: (If the answer is yes) write down the approaches they (or imaginary you) use to strengthen this capability. (If the answer is no) write down how you want to support them/how you want to be supported.	
Bodily Integrity	Capable or not	(In)Capable Scenarios	Strengthening Approaches/External Support
Being able to move freely from place to place, to be secure against violent assault, including sexual assault and domestic violence, having opportunities for sexual satisfaction and for choice in matters of reproduction.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	1. cane and wheelchair can help elderly people to go wherever they want 2. they know what they like so they can satisfy themselves (I think) and with technology today, I think reproduction is possible for them	1. people should know not to assault or hurt others. It's not responsibility of the victim. 2. normalize the need/want of elderly about sexual satisfaction/choice of reproduction
Being able to move freely from place to place to be secure against violent assault, including sexual assault and domestic violence, having opportunities for sexual satisfaction and for choice in matters of reproduction.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	• Health issues hinder free movement at times - requirement of cane, absence of ramps, lifts. • Social stigma may prevent opportunities of sexual satisfaction, especially in case of absence of married partner.	- Provision and consideration for elderly's movement through personal products + in public spaces - Normalizing elderly sexual needs + partner technology can support reproduction
Being able to move freely from place to place to be secure against violent assault, including sexual assault and domestic violence, having opportunities for sexual satisfaction and for choice in matters of reproduction.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	incapable: the outside is not controllable for me I can only try to avoid capable: any choice that I can make depends on myself. I can choose who I want to be with	→ incapable: try to be safe, reduce risks, stick to common sense. → capable: try to communicate as early as possible, be open to good suggestions and try to avoid people who have
Being able to move freely from place to place to be secure against violent assault, including sexual assault and domestic violence, having opportunities for sexual satisfaction and for choice in matters of reproduction.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	capable/incapable: I could move freely but would probably be a bit more vulnerable for assault? Maybe mobility will be hindered and more constraining. capable: I think this could work but there is a social stigma connected to it	→ A super strong smart car differently that beats + electric assistances → pepper-spray cane → Normalize sex for elderly. More society act.
Being able to move freely from place to place to be secure against violent assault, including sexual assault and domestic violence, having opportunities for sexual satisfaction and for choice in matters of reproduction.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	Some old people have troubles to walk and have weaker muscles and patters to again not violence, they may not wheelchairs or public equipment to support them, but I don't think they're responsible for sexual satisfaction reproduction	Maybe there could be more research about reproduction and sexual issues above old people, consider if and doctors could give more support on them, there could be more devices to support walking and other problems, and protect that.

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Emotion	Capable or not	(In)Capable Scenarios	Strengthening Approaches/External Support
Being able to have attachments to things and people outside ourselves; to love those who love us in general, to love, to give, to experience intimate friendship and parental affection, and having the capacity to support forms of human association that can be chosen to be central in their development.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	can be true opinions quite often. I think it's different to disagree people, depends on where their life was, what they had experienced before, but elderly people might be more capable on this compared to young people in general.	try to explain/affirm that it is not too bad, have less expectations. 2ph 2k 17. 2k 2k 2k
Being able to have attachments to things and people outside ourselves; to love those who love us in general, to love, to give, to experience intimate friendship and parental affection, and having the capacity to support forms of human association that can be chosen to be central in their development.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	I think attachments might be different because in western society it wouldn't necessarily be a mutual benefit relationship -> need to correct? I feel like old people aren't allowed to be angry -> then it's dismissed by others.	→ I think it's different to disagree people, depends on where their life was, what they had experienced before, but elderly people might be more capable on this compared to young people in general.
Being able to have attachments to things and people outside ourselves; to love those who love us in general, to love, to give, to experience intimate friendship and parental affection, and having the capacity to support forms of human association that can be chosen to be central in their development.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	long lives with experiences of birth and death, families growing & losing loved ones, enable elderly to formulate & nurture various human associations.	→ I think it's different to disagree people, depends on where their life was, what they had experienced before, but elderly people might be more capable on this compared to young people in general.
Being able to have attachments to things and people outside ourselves; to love those who love us in general, to love, to give, to experience intimate friendship and parental affection, and having the capacity to support forms of human association that can be chosen to be central in their development.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	It's understanding yourself which I imagine that I'll be able to understand and live with those feelings and emotions I have understand that it's what it is in life.	- supportive community/neighbour - space to share/talk/understand others - space to be with yourself (but feel good not lonely)

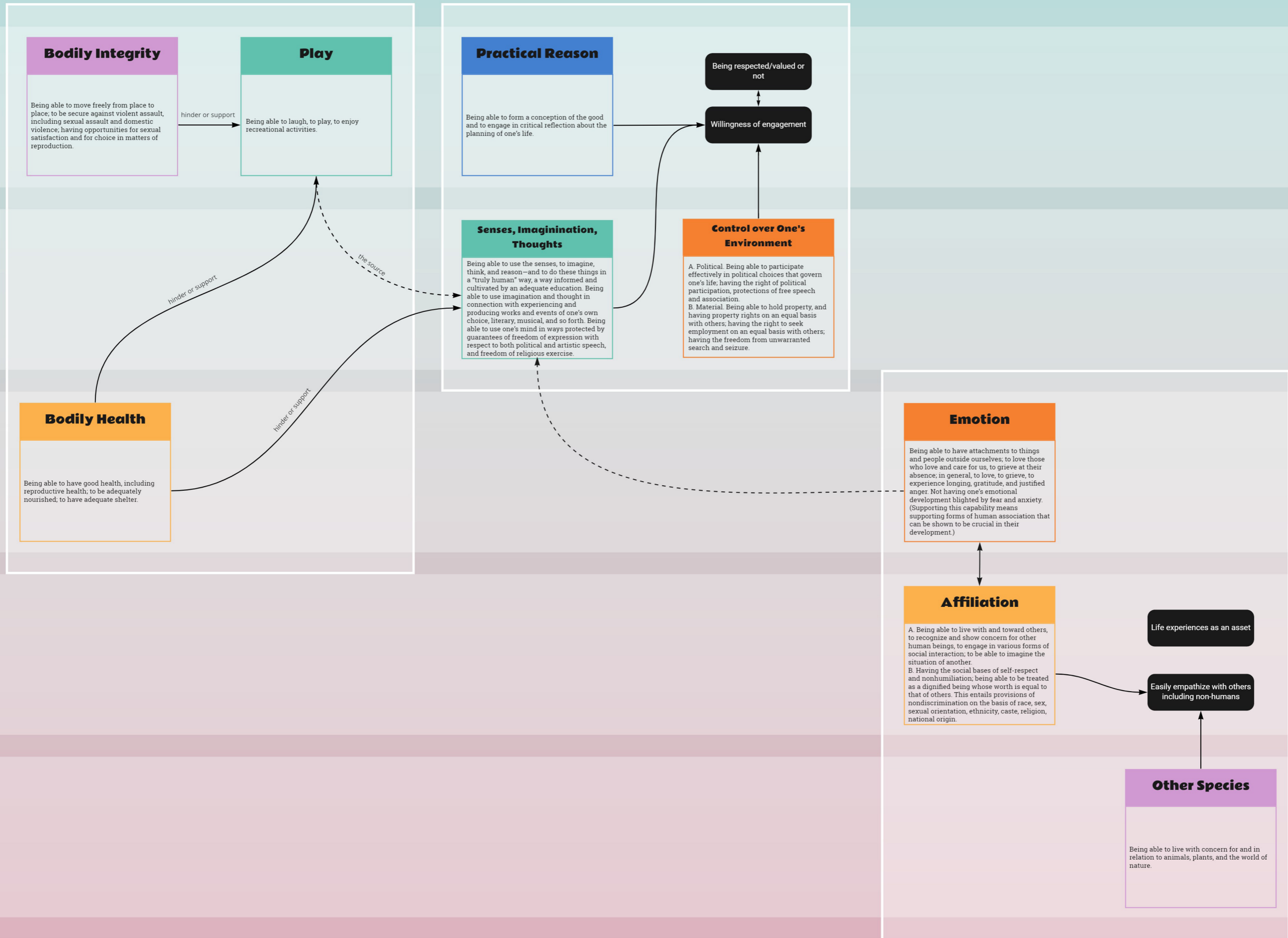
Now you will use 10 central capabilities (Nussbaum, 2006)		Whether they (or the imaginary elderly you) are able to achieve this capability	
Please read the definition on the left carefully. You can complete the following exercises by recalling your experiences with your grandpa/grandpa or by imagining when you are old.		In the 2nd column: (If the answer is yes) write down the approaches they (or imaginary you) use to strengthen this capability. (If the answer is no) write down how you want to support them/how you want to be supported.	
Bodily Health	Capable or not	(In)Capable Scenarios	Strengthening Approaches/External Support
Being able to have good health, including reproductive health, to be adequately nourished, to have adequate shelter.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	• Good health through morning walks • Meeting dietary requirement, regular health check-ups • Spending time with family/friends	- Regular exercising / active daily activities - Home adjustments to support / movement daily - Community for elderly: support
Being able to have good health, including reproductive health, to be adequately nourished, to have adequate shelter.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	- It takes too much in one's body to have a kid so I think elderly can't/shouldn't sacrifice their own health for that. - exercising, doing activity or being happy will give them good health - adequate shelter is easy with money	- other options of reproduction - supportive community + activities - have a plan for life -> in order to have adequate shelter, and other basic needs
Being able to have good health, including reproductive health, to be adequately nourished, to have adequate shelter.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	- Good health through exercise, walking, swimming, being outside - is capable of cats and perhaps other pets. - Might have to find new forms of exercise possibly can't run when old	- New forms of exercise that work for us and our fun. → Group exercise - Running sports wearable? e-bike for running → Stairs for old people - celebrate
Being able to have good health, including reproductive health, to be adequately nourished, to have adequate shelter.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	Some people may have capability to do some activities in order to keep health, but for some people may have troubles or diseases which make them have problems with movement activities that normal people can do, and some poor elderly people don't have money for good food and adequate shelter.	There can be some nursing homes for old poor old people or some public fitness equipments in order to help them with keeping health.
Being able to have good health, including reproductive health, to be adequately nourished, to have adequate shelter.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	incapable: each individual could differ in health issues. capable: shelter & nourish.	→ exercise, food experiment, more test for prevention. → prepare enough materials at early age, improve welfare for elderly people

Now you will use 10 central capabilities (Nussbaum, 2006)		Whether they (or the imaginary elderly you) are able to achieve this capability	
Please read the definition on the left carefully. You can complete the following exercises by recalling your experiences with your grandpa/grandpa or by imagining when you are old.		In the 2nd column: (If the answer is yes) write down the approaches they (or imaginary you) use to strengthen this capability. (If the answer is no) write down how you want to support them/how you want to be supported.	
Other Species	Capable or not	(In)Capable Scenarios	Strengthening Approaches/External Support
Being able to have good health, including reproductive health, to be adequately nourished, to have adequate shelter.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	- elderly seems to spend their time at home or in nature. Therefore, they will care for animals, plants, and nature as if they are their friends	→ have accessibility to the world of nature for elderly must be nice. maybe they're too weak to go into the forest for hiking but there should be alternatives for them.
Being able to have good health, including reproductive health, to be adequately nourished, to have adequate shelter.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	- Elderly spend a lot of daily time talking to rituals which involve care & consolation of nature - such as watering plants, gardening or feeding birds	- Pets can encourage concern for the non-human natural world. - Awareness & exposure of consequences (how tech?) of our actions towards the natural world.
Being able to have good health, including reproductive health, to be adequately nourished, to have adequate shelter.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	When I have more time, as long as there are plants and animals, I can feel my concerns for them.	→ spend time with the nature, be respectful, observe seasonalities. → observe!!
Being able to have good health, including reproductive health, to be adequately nourished, to have adequate shelter.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	Can still be around animals and plants. However, I think I will be more limited in what type of animals and where in nature I can go	→ A robot - dog. All the nice things about a dog but not needs to go for walks, ect. → Smart shoes for hiking outdoors. → Hiking falls + extra support
Being able to have good health, including reproductive health, to be adequately nourished, to have adequate shelter.	Yes No <u>Partly Yes (No)</u> <small>*You can underline the parts you feel capable of.</small>	I even think old people may more interested in houses than young people. They also have more time for that.	Build more parks in cities, which near their homes, and put more assistive equipment in the parks, botanical gardens

APPENDIX D.

How you will use 10 central capabilities (March 2006)		3	
Please read the definition on the left carefully. You can complete the following exercises by recalling your experiences with your products/grandpa or by imagining what you can do.		Whether they (or the imaginary elderly you) are able to achieve this capability. In the 1st column write down the related scenarios.	In the 2nd column: If the answer is yes write down the approaches they (or imaginary you) use to strengthen this capability. If the answer is no write down how you want to support them/how you want to be supported.
Senses, Imagination, Thoughts	Capable or not	(In)Capable Scenarios	Strengthening Approaches/External Support
Being able to use the senses to imagine, think, and reason - and to do these things in a "fully human" way, a way informed and cultivated by an adequate education, being able to use imagination and thought in connection with experiencing and producing works and events of great value, literary, artistic, and so forth. Being able to use one's mind in ways protected by guarantees of freedom of expression with respect to both political and artistic speech, and freedom of religious exercise.	Partly Yes (No)	<p>Incapable:</p> <p>→ perhaps production can be hindered if I am weaker and my hands are shaking.</p> <p>→ precise work, painting, etc.</p> <p>→ building, lifting, listening.</p> <p>capable:</p> <p>→ having imagination - thoughts about</p>	<p>→ brush-holder that doesn't shake.</p> <p>→ "stabilizer" - like for cameras but for us</p> <p>→ strengthening prosthetics making lifting, etc. easier.</p>
Being able to use the senses to imagine, think, and reason - and to do these things in a "fully human" way, a way informed and cultivated by an adequate education, being able to use imagination and thought in connection with experiencing and producing works and events of great value, literary, artistic, and so forth. Being able to use one's mind in ways protected by guarantees of freedom of expression with respect to both political and artistic speech, and freedom of religious exercise.	No	<p>maybe imagination and connection social norm is easy, but it's not the producing works will be a flow but also capable to achieve.</p>	<p>to write down things, organize them on notes, use some software or software create productivity to produce networks, use posters from other young people, like have an assistant.</p>
Being able to use the senses to imagine, think, and reason - and to do these things in a "fully human" way, a way informed and cultivated by an adequate education, being able to use imagination and thought in connection with experiencing and producing works and events of great value, literary, artistic, and so forth. Being able to use one's mind in ways protected by guarantees of freedom of expression with respect to both political and artistic speech, and freedom of religious exercise.	No	<p>Incapable: political oppression - maybe not always possible for its risks in some countries</p> <p>capable: experience and produce art can be quite free. religions are also free for choice</p>	<p>→ incapable: maybe use metaphors. (at least we can use metaphors these days, but not always)</p> <p>→ capable: by meditation, be free. try to take down anything in mind.</p>
Being able to use the senses to imagine, think, and reason - and to do these things in a "fully human" way, a way informed and cultivated by an adequate education, being able to use imagination and thought in connection with experiencing and producing works and events of great value, literary, artistic, and so forth. Being able to use one's mind in ways protected by guarantees of freedom of expression with respect to both political and artistic speech, and freedom of religious exercise.	Partly Yes (No)	<p>elderly have so much experience to tell and they can use creativity & imagination to show it in some work.</p> <p>-with politic and religious I think it's difficult and I wouldn't want to involve much in the discussion - when I'm old.</p>	<p>→ give ideas/tools for them to create something from their experience</p> <p>→ encourage elderly to participate in various kinds of activity where they can have fun and share opinion.</p>
Being able to use the senses to imagine, think, and reason - and to do these things in a "fully human" way, a way informed and cultivated by an adequate education, being able to use imagination and thought in connection with experiencing and producing works and events of great value, literary, artistic, and so forth. Being able to use one's mind in ways protected by guarantees of freedom of expression with respect to both political and artistic speech, and freedom of religious exercise.	Partly Yes (No)	<p>Diminished mental or physical capabilities may hinder creative expression.</p> <p>→ Interest & enthusiasm towards cultural activities can encourage expression</p>	<p>→ Though hobbies like cooking, dancing or anything they prefer can nurture creativity.</p> <p>→ Participation in various types of forms of activities.</p>





APPENDIX E.



Bodily Health

- **Do you often cook yourself? Will you mind the nutrient balance?**
- **Do you often exercise?**
- **Do you often sleep well?**

Bodily Health

- **How often do you do the clean-up for your house? How do you do it?** (e.g. By hand? Cleaning robots?)
- **Do you like doing home-improvement?** (e.g. Decoration? DIY furnitures?)

Senses, Imagination, Thoughts

- **Do you think it's important to keep up with what's happening around you by reading news or other means?**

Senses, Imagination, Thoughts

- **Do you like talking about your opinions with others?**
- **Do you like express your thoughts through creative activities** (e.g. writing, painting, singing, making artistic works, etc.)?

Bodily Integrity

- **Do you often go on trips?**
- **Do you feel free and safe to travel anywhere you want?**

Play

- **What are your hobbies? Are they new hobbies or old hobbies you've kept for a long time?**
- **What do you like to do for leisure?**

Practical Reason

- **Do you think you have a standard for doing or not doing certain things?** (i.e. judge what's good/right and what's bad/wrong)
- **Do you often reflect on your life and yourself?**

Control Over One's Environment

- **Do you feel free to make your voice heard publicly?**
- **Do you feel secure financially?**

Emotion

- **How do you stay connected with your family** (e.g. sons/daughters, grandsons/granddaughters)? **What activities do you often do together?**

- **Do you express your feelings** (e.g. love, care, longing, anger) **to them? How?**

Technology

- **Pick 1-3 smart devices or digital applications you use in daily life.**

- **What do you think about it?** (e.g. annoying? helpful?)

Challenging

Affiliation

- **How do you stay connected with your friends?** **What activities do you often do together?**

- **Do you often laugh with your friends when they're happy and cry with them when they're sad?**

Other Species

- **Do you like living with concern for and in relation to other species like plants or animals?**

- **Do you like being connected to the world of nature?**

Desired

Enjoyable

APPENDIX F.



Monitor Bodily Data
(e.g. heartbeats, blood pressure, mood)

Visualise and Present Data
(e.g. privately or publicly)

Receive and Send Messages/Signals
(e.g. stay connected with others, SOS signal)

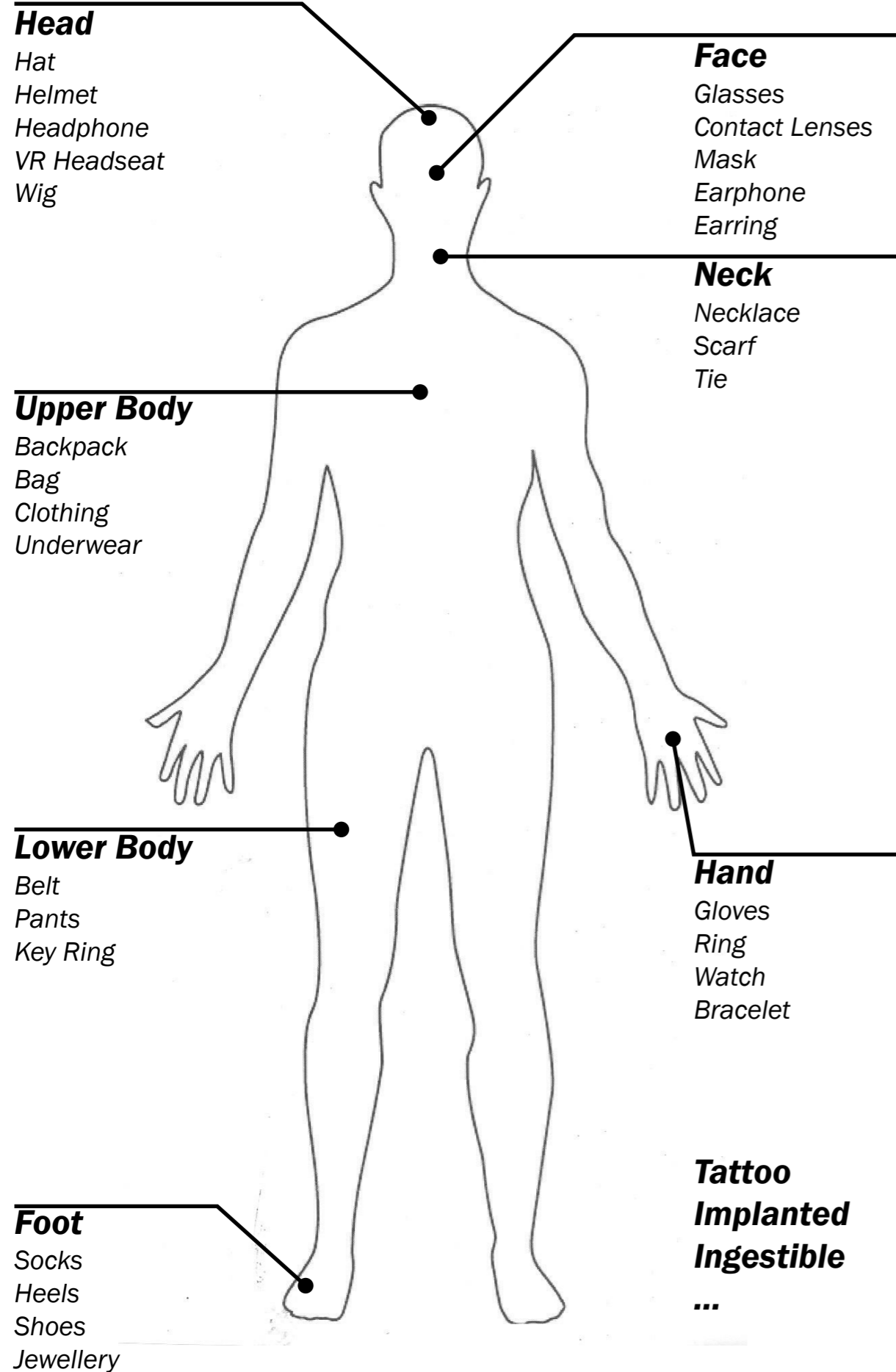
Haptic Notification

Enhance Beauty

Customized Forms and Shapes

Contextual Intelligence
(e.g. signal danger, task reminder, instant translation)

?



APPENDIX G.



Code	Sub-Code	Comment
○ Anna		
In Vivo	● "not a hobby person"	everyday life is centered around work
	● you're looking for ways that you can stretch time and live longer ● keep a cap on my emotions	
Profession	○ profession - photographer	record cultural heritage language barrier
Personality	○ personality - suppressed emotional	
	○ personality - tamed and tolerant in conversation with friends	
Story	○ [story] - a third generation photographer	
	○ [story] - flexible work life and full of coincidences and 'whims'	
	○ [story] - keep a cap on the emotion in funerals	
Capability Approach	● [affiliation] - how turn a Facebook friend into a real friend	begin with coffee chat happen to like each other keep in touch precondition - live in the same city and easy to
	● [affiliation] - mediate with a friend through messenger	
	● [bodily health] - not sleep well (use melatonin)	
	● [bodily integrity] - part of job	
	● [emotion] - be with and support the loved	
	● [emotion] - suppress negative emotion to avoid upsetting friends	
	● [senses, imagination, thoughts] - try to be neutral when speaking publicly	
	● [other spieces] - important to feel small in the nature	
	● [practical reason] - certain standart for things in work	
Scenario	● [practical reason] - reflection on the best solutions to solve conflicts	
	● [scenario] - a fitbit that can calculate the food intake	
	● [scenario] - earphone - walking on the street and remind of danger	everyone's accosiation of scenarios are quite different, which are deeply rooted in their own life experience (when and how they use the object in their life)
	● [scenario] - get notified when reach 10000 steps	
	● [scenario] - jewelry:auto-changing color according to the clothes	
	● [scenario] - project a larger photo to the glasses to break the restriction of the screen	
	● [scenario] - smart gloves(gesture-controlled) which can send help signals	finger tip wearables
	● [scenario] - smart shoes analyzing how you walk	

Challenge	● challenge - loneliness	old friends die not working > not meet new people less physical contact physical contacts not always lead to friendship lack of knowledge of using social media
	● challenge - people get old and friends die>loneliness	
	● challenge - elderly people don't work > not meet new people > loneliness	
Desire/ Needs	● desire - function - count steps, weight, monitor heartbeats, mood recording	
	● desire - live in health longer	
	● need - mind protein intake as a vegetarian	
	● need - would like to have a cleaning robot to save efforts in cleaning	
Process	○ process - tapping the finger tip to perform the gesture used to send SOS signals	
Product	● product -laptop	
Value	● value - much stuff people post on social media is crap	
	● value - physical contacts not always lead to friendship	
	● value - social media can still be helpful to keep in touch with real friends	
	● value - take work serious and devoted to work	
○ Emily		
In Vivo	● it keeps me young	
	● nobody wants to talk to you anymore	
Hobby/ Interest	○ hobby - choir (stop because of covid)	
	○ hobby - photography	
	○ interest - interiors design	
	○ interest - photo editing	
	○ interest - politics	
Talent	○ talent - interiors design	
Personality	○ personality - creative	
	○ personality - explorative	
	○ personality - follow interior design trends	
	○ personality - life-long learner	
	○ personality - social	
	○ personality - use phone as a communication tool more (in contrast with husband)	
Story	○ [story] - a recipe book made with the collective efforts of a club	
	○ [story] - be forced to have meetings online	at first difficult but later found it convenient
	○ [story] - hard to reflect together in a book club	

Capability Approach	○ [story] - to have the reading club meeting offline to involve everybody	
	○ [story] - using a special program to organize party time	
	● [affiliation] - book club	
	● [affiliation] - cook and eat with friends	
	● [affiliation] - elderly people network proposing to the municipality	
	● [affiliation] - intellectual eating club	
	● [affiliation] - photography club	
	● [bodily health] - follow a tv program for elderly people to do exercise	
	● [bodily integrity] - travel choices limited by physical states	
	● [emotion] - frequent family visit and online contact	
	● [emotion] - safari park visit with family	
	● [play] - play bridge card	
	● [play] - watching tv netflix	
	● [practical reason] - strong judgement on what's good/bad	
	● [senses, imagination, thoughts] - intellectual discourses with friends	
● [senses, thoughts, imagination] - reading news		
Scenario	● [scenario] - visit virtual museums online for elderly people	
	● [scenario] - visit virtual museums online for elderly people (2)	
	● [scenario] - when physical conditions decline, using Internet to know about the world outside	
Challenge	● challenge - although willing to but hard to keep up with the development (e.g. softwares)	how to use the cloud to store photos takes time to learn how to use some apps or
	● challenge - declined memory	need to relearn remember where the stored photos are
	● challenge - declined physical conditions	
	● challenge - need to change the ways of travel (husband's preference, bad eyesight)	used to sail and go camping and outdoor
	● challenge - use software to edit photos	
	● change - digitalization of service diminishes the human contact	
	● change - online meetings are much more than before	
Story	● desire - have a smart watch which can be integrated with various functions	concerned about the legibility when eyesight is not good want to have haptic
	● desire - follow the trends	

Desire/ Needs	● desire - have immersive glasses to experience virtual reality	
	● desire - know more about other cultures	
	● desire - like to change (in contrast to her husband)	
	● desire - missing the physical contacts	
	● desire - need to exercise more	
	● desire - planning for dreamed trips	
	● desire - privacy - not want others know the self-reflection	
	● desire - to keep up with the trends keeps me young	
Process	○ process - Voice User Interface	
	○ process - debating over whether certain functions are useful or not	constantly monitoring bodily state (e.g. glucose) VUI control home not necessary unless you have got into that situations
Product	● product - annoyed about the compulsory use of online tools	
	● product - ebook reader	
	● product - google	
	● product - intimidated to use cameras	
	● product - iPad	
	● product - only use ebook reading on holiday	
	● product - physical books rather than ebooks	
	● product - smart watch	
	● product - using certain programs by recommendation	
Value	● value - woken up by smart home devices	
	● value - being forced online gathering also brings new possibilities	
	● value - old people need to know how to use the computer and Internet	
	● value - online interactions with the organizations can be efficient but also cold	
	● value - online service should be an option but not the only option	
	● value - provide help and support rather than just being sad	
	● value - reading about new information keeps people alert and creative	
	● value - the online meeting tools are not inclusive enough for people who're visually or hearing impaired	
	● value - VUI can be useful for elderly people	
	● value - willing to use a cleaning robot	
○ John		
	● [memo] - anywhere on the body is fine as long as it makes sense	

Memo	● [memo] - changing the form and shapes might help	minimalize to make it less noticeable stylish shapes
	● [memo] - medium	old people are used to certain traditional mediums (e.g. manual customer service) than
	● [memo] - shame caused by certain products ● [memo] - sth physical tangible familiar	
In vivo	● Like people are walking with a cane.	
	● they want to look young and to look clean, vital and not old. I don	
	● Not click, not not so fast.	
	● under control	
	● prepared for being old ● added value	
Personality	○ personality - altruistic	
	○ personality - care for equity	
	○ personality - care for social justice	
	○ personality - expressive	
	○ personality - follow technology trends	
	○ personality - independent ○ personality - leadership ○ personality - resourceful	
Environment	○ environment - well-informed	
Hobby/ Interest	○ hobby - reading	
	○ interest - American politics ○ interest - why people behave so	
Talent	○ talent - propose to the municipality	
	○ talent - understand people's responses	
Story	○ [story] - a young influencer on twitter	
	○ [story] - an exhibition in Leeds	
	○ [story] - fulfill personal value through helping small organizations	
	○ [story] - immediately decided to use the hearing aids when he found he needed ○ [story] - no physical menu restaurant	
Capability Approach	● [bodily health] - anticipated physical declination	
	● [bodily health] - breakfast	
	● [bodily health] - clean up once a week	
	● [bodily health] - diabetes	
	● [bodily health] - grocery	
	● [bodily health] - health check	
	● [bodily health] - mind nutrients, sugar, estimate amount, not calculation, health check	
	● [bodily integrity] - sit in first class	
	● [control over one's environment] - should let voice be heard by the municipalities	
	● [emotion] - family union on holidays, joking and laughing	

	<ul style="list-style-type: none"> • [play] - reading, movies, museums, eating out • [senses, imagination, thoughts] - check messages • [senses, imagination, thoughts] - follow influencer on twitter 	
	<ul style="list-style-type: none"> • [senses, imagination, thoughts] - reading news on newspaper and twitter 	
Scenario	<ul style="list-style-type: none"> • [scenario] - aging in place 	aging in place can be difficult effective company is
	<ul style="list-style-type: none"> • [scenario] - an old lady who loves watching tv becomes sad when the tv is not functioning 	dysfunction scenarios old people have the mediums they are more
	<ul style="list-style-type: none"> • [scenario] - light leading to the bathroom for dementia people 	
	<ul style="list-style-type: none"> • [scenario] - living alone falling down send signals 	confirm before sending signals
	<ul style="list-style-type: none"> • [scenario] - make gerontology more accessible by making it part of the insurance 	
	<ul style="list-style-type: none"> • [scenario] - mass production lowers the cost 	
	<ul style="list-style-type: none"> • [scenario] - mood predict/monitoring (and let friends or family know) 	
	<ul style="list-style-type: none"> • [scenario] - online banking which is not accessible for everyone 	
	<ul style="list-style-type: none"> • [scenario] - pay the bill with apple pay on the watch 	Impressed by the smooth paying process Trigger the desire to have the same easy and efficient experience
	<ul style="list-style-type: none"> • [scenario] - take care of dementia people 	tiring jobs for care givers (24/7)
	<ul style="list-style-type: none"> • [scenario] - using online tools to unite elderly people who live alone and help each other 	
	<ul style="list-style-type: none"> • [scenario] - voice control tv remote • [scenario] function - lovely reminder of certain daily events (e.g. not going to the music concert for one year) 	
	Avoid	<ul style="list-style-type: none"> • avoid - hearing aids like a cane which brings shame
Desire/Needs	<ul style="list-style-type: none"> • desire - like the mood-light apparatus 	
	<ul style="list-style-type: none"> • need - safety at home for people with dementia 	
Process	<ul style="list-style-type: none"> ○ process - (performing checking the smart watch now and then hearing or not hearing the notification sounds) 	annoyed by the persistent notifications
	<ul style="list-style-type: none"> ○ process - performing people hide their hearing aids to change batteries 	
	<ul style="list-style-type: none"> • product - a notebook with a list documenting nephews' updates 	regard family connections important
	<ul style="list-style-type: none"> • product - apple watch 	not want too many noises from the watch
	<ul style="list-style-type: none"> • product - bike rather than e-bike 	
	<ul style="list-style-type: none"> • product - blood sugar monitor 	

Product	<ul style="list-style-type: none"> • product - cleanin robot (not necessary) • product - comparison between apple watch and fitbit 	
	<ul style="list-style-type: none"> • product - ebike = status symbol 	
	<ul style="list-style-type: none"> • product - family influence > product use 	what other family members use influence his
	<ul style="list-style-type: none"> • product - function - voice control(+) • product - hearing aids 	people feel shameful to wear them
	<ul style="list-style-type: none"> • product - instagram - for family and friends • product - iPhone 14 & Apple watch • product - notify care givers in emergent situations 	the care givers can be relieved (Juan) associated to the story of demantia old lady
	<ul style="list-style-type: none"> • product - remote control lights/music/tv(-) • product - seek after added value • product - smart TV and smart remote control • product - smartphone • product - twitter • product - vacuum cleaner • product - whatsapp (family&friends) 	send photos not emails or telephone
	<ul style="list-style-type: none"> • product - zoom - family zoom meeting 	nice to still have the chance to meet online but not the best experience
	<ul style="list-style-type: none"> • product/system - smart home • product/system - using iphone with apple watch 	
	<ul style="list-style-type: none"> • value - [technology] - interactions shouldn't always be clicking around • value - approve of the whole apple system • value - attitude - doubt and concerned about the security • value - convenience breeds laziness • value - customized technology for each individual • value - data sharing only to necessary people is fine • value - impolite to be distracted by the smart watch • value - inclusivity & accessibility > easy to be supported by the government • value - information helps form opinions and worldviews • value - information helps stimulate minds • value - make information more accessible • value - not like to be interrupted • value - not use overqualified technology • value - online tools make connecting with people easier, life more convinient • value - open to different possibilities 	beneficial for coping with health issues

Value	<ul style="list-style-type: none"> value - people need to be taught about how to use certain smart devices 	
	<ul style="list-style-type: none"> value - persuaded by others 	
	<ul style="list-style-type: none"> value - politics influence policies 	
	<ul style="list-style-type: none"> value - practicalism 	
	<ul style="list-style-type: none"> value - see functions as the main reason for buying 	goal: be informed of the physical state feel under control save the effort to go for health check for every 3 months
	<ul style="list-style-type: none"> value - some elderly people refuse to be old 	some wish to stay young forever some are ashamed of needing tools to function normally
	<ul style="list-style-type: none"> value - technology as a tool to support each other 	
	<ul style="list-style-type: none"> value - technology should be easy to use 	
	<ul style="list-style-type: none"> value - technology should be inclusive (everyone should have access to it) 	
	<ul style="list-style-type: none"> value - technology should be slower to be more accessible 	
	<ul style="list-style-type: none"> value - the functions the product has and the design is what matters but not where it's used 	
	<ul style="list-style-type: none"> value - use it only when necessary value - use your own strength when possible 	
	○ Robert	
Memo	<ul style="list-style-type: none"> [memo] - shame caused by certain disease 	
	<ul style="list-style-type: none"> [memo] - the sin of honest and constant recording 	
	<ul style="list-style-type: none"> [memo] - wearable can be an implicit way of stating 	
In vivo	<ul style="list-style-type: none"> distance 	
	<ul style="list-style-type: none"> eye opener 	
	<ul style="list-style-type: none"> hidden meaning 	
	<ul style="list-style-type: none"> Also, you have to, when you don't understand something, it takes some 	
	<ul style="list-style-type: none"> other perspective The Future of yesterday 	
Hobby/ Interest	<ul style="list-style-type: none"> hobby - gardening 	
	<ul style="list-style-type: none"> interest - history, association, how and why people think in certain way 	
Personality	<ul style="list-style-type: none"> personality - deep thinker 	
	<ul style="list-style-type: none"> personality - growth mindset 	
	<ul style="list-style-type: none"> personality - optimistic 	
Story	<ul style="list-style-type: none"> [story] - a friend distracted by Google glasses 	
	<ul style="list-style-type: none"> [story] - a girlfriend interested in astrology 	
	<ul style="list-style-type: none"> [story] - a letter pen pal 	
	<ul style="list-style-type: none"> [story] - a life-long recording of life (enzensberger) 	
	<ul style="list-style-type: none"> [story] - almost an auto-reply to an email of a friend's death 	
	<ul style="list-style-type: none"> [story] - clumsy body modification of last century 	

	<ul style="list-style-type: none"> [story] - cows as real cows not commodities 	
	<ul style="list-style-type: none"> [story] - spontaneous travel 	
	<ul style="list-style-type: none"> [story] - the evolution of typing tools 	
Capability Approach	<ul style="list-style-type: none"> [other species] - inhuman way to treat live stock and poultry 	
	<ul style="list-style-type: none"> [other species] - whales' special way of sleeping 	
	<ul style="list-style-type: none"> [other species] - being connected to the nature and wilderness to feel small 	
	<ul style="list-style-type: none"> [senses, imagination, thoughts] - at least to be informed about surroundings 	
	<ul style="list-style-type: none"> [senses, imagination, thoughts] - interview artists and writing about exhibitions 	
Scenario	<ul style="list-style-type: none"> [scenario] - chronicle disease 	
	<ul style="list-style-type: none"> [scenario] - heart condition - send help signals 	
	<ul style="list-style-type: none"> [scenario] - IoT service system 	
	<ul style="list-style-type: none"> [scenario] - monitor the state of elderly people and inform children to assure them 	
	<ul style="list-style-type: none"> [scenario] - people with diabetes implicitly show their state via wearables 	
Avoid	<ul style="list-style-type: none"> avoid - information overload 	
Process	<ul style="list-style-type: none"> process - pointing one spot on the jaw 	
Product	<ul style="list-style-type: none"> product - arms or internally placed wearables 	
	<ul style="list-style-type: none"> product - conductive gloves to tap on phones 	
	<ul style="list-style-type: none"> product - facebook, twitter 	
Value	<ul style="list-style-type: none"> value - dressing code should be aligned with the age 	
	<ul style="list-style-type: none"> value - elderly people should instead focus on what new things to learn 	
	<ul style="list-style-type: none"> value - embrace it as what it is 	
	<ul style="list-style-type: none"> value - IM apps give us less time to respond resulting in shallowness 	
	<ul style="list-style-type: none"> value - information helps understand what's happening 	
	<ul style="list-style-type: none"> value - life accelerated by technology 	
	<ul style="list-style-type: none"> value - modern technology makes people more impatient 	
	<ul style="list-style-type: none"> value - most elderly people focus on what they are losing 	
	<ul style="list-style-type: none"> value - no use to compare now and the past 	
	<ul style="list-style-type: none"> value - not ethical to register everything (might not want to relive that) 	
	<ul style="list-style-type: none"> value - not judge 	
	<ul style="list-style-type: none"> value - people should have the right to choose whether use technology or not 	
	<ul style="list-style-type: none"> value - technology lowers the cost for communication but also render it less precious 	
	<ul style="list-style-type: none"> value - the past prediction of the future can be ridiculous 	
	<ul style="list-style-type: none"> value - unnoticeable devices which only stand out in emergent situations 	

	<ul style="list-style-type: none"> value - we as humans are ignorant of other animals value - we treat animals bad value - we treat live stock as products(commodity) not living beings 	
	<ul style="list-style-type: none"> value - we're being more and more integrated with technology 	
	<ul style="list-style-type: none"> value - young people are better at multitasking than elderly people, faster response to emergent situations 	
○ Tina		
Memo	<ul style="list-style-type: none"> [memo] - connection with others / loneliness 	
	<ul style="list-style-type: none"> [memo] - searching quotient 	open a special door to technology for elderly
	<ul style="list-style-type: none"> [memo] - self-realization/meaning in life 	
Personality	<ul style="list-style-type: none"> personality - adventurous 	
	<ul style="list-style-type: none"> personality - planner, prone to regularity 	
	<ul style="list-style-type: none"> personality - prefer to be simple and efficient in daily chores 	
Hobby/ Interest	<ul style="list-style-type: none"> hobby - (Tini) like recoding daily nice moments by photos 	
	<ul style="list-style-type: none"> hobby - museum (to get inspired) 	
	<ul style="list-style-type: none"> hobby - sewing and knitting 	make toys get inspired by the artworks knit covers for the pillow making apron (wow!) obsessed with sewing
Story	<ul style="list-style-type: none"> [story] - 30min limit to talk about illness 	
	<ul style="list-style-type: none"> [story] - finding lecturers too enthusiastically 	
	<ul style="list-style-type: none"> [story] - like beach because of childhood memories 	
	<ul style="list-style-type: none"> [story] - like brothers not sisters because of higher education more common interest 	
	<ul style="list-style-type: none"> [story] - like paris and home exchange friend in Paris 	
	<ul style="list-style-type: none"> [story] - love watching tv programs about photography rather than cooking and baking 	
	<ul style="list-style-type: none"> [story] - parents don't have holiday to travel makes me decide to work for a travel agency 	adventurous explorative
	<ul style="list-style-type: none"> [story] - win an award for finishing a crossword puzzle 	
Capability Approach	<ul style="list-style-type: none"> [affiliation] - long-term friendship from high school 	
	<ul style="list-style-type: none"> [bodily health] - eating at the same time 	
	<ul style="list-style-type: none"> [bodily health] - go to bed at 10:30 	
	<ul style="list-style-type: none"> [bodily health] - wake up at the same time everyday 	
	<ul style="list-style-type: none"> [emotion] - family visit (do chores, accompany grandchildren) 	
	<ul style="list-style-type: none"> [play] - watching tv in the evening 	
	<ul style="list-style-type: none"> [practical reason] - making plans at the beginning of the day 	
	<ul style="list-style-type: none"> [senses, imagination, thoughts] - talk with friends about thoughts and opinions 	

Scenario	<ul style="list-style-type: none"> [scenario] - a bag as a reminder to bring certain things or where to put certain things 	
	<ul style="list-style-type: none"> [scenario] - a belt as a reminder to regulate food intake 	
	<ul style="list-style-type: none"> [scenario] - a cap protecting skin from burning sunshine 	
	<ul style="list-style-type: none"> [scenario] - combine jewelry with medicines 	reminder to take pills
	<ul style="list-style-type: none"> [scenario] - paired belt-earring/earphone 	
Desire/ Needs	<ul style="list-style-type: none"> desire - be busy in doing sth. / spend everyday meaningfully 	
	<ul style="list-style-type: none"> desire - have a smart watch which can make phone calls 	no need to look at the phone
	<ul style="list-style-type: none"> desire - like the experience of VR 	
	<ul style="list-style-type: none"> desire - not want to be alone all day 	
	<ul style="list-style-type: none"> desire - prefer to family visit rather than long trip 	
	<ul style="list-style-type: none"> desire - to keep healthy need - mind healthy status 	
Process	<ul style="list-style-type: none"> process - excitedly showing her sewn stuffed toys to me 	
	<ul style="list-style-type: none"> process - scrolling the organized photos from the cloud expertly 	
Product	<ul style="list-style-type: none"> product - polarsteps (a travel-track web) 	
	<ul style="list-style-type: none"> product - Tito 	
	<ul style="list-style-type: none"> product - want to have the wearables on the head which has most senses 	
	<ul style="list-style-type: none"> product - YouTube 	
	<ul style="list-style-type: none"> product - YouTube as a tool to search solutions 	
Value	<ul style="list-style-type: none"> value - mind the diet in consideration for healthy 	

APPENDIX H.



APPENDIX I.



Activity Cards

Bodily Health

Healthy Lifestyle

e.g. healthy diet, exercise, sleep

Bodily Health

Cope with Illness

e.g. medication reminder, health advice

Bodily Health

Mental Health

e.g. cheer you up, cause finding, introspection, expression

Bodily Health

Self-awareness

e.g. notice abnormality

Meta-functions

Monitor

(e.g. heartbeats, blood pressure, glucose, steps)

Measure

(e.g. weight, length, distance, time span)

Detect

(e.g. movements, gestures, environment sounds)

Notify/Alert

(e.g. emergency, warning)

Show Data

(e.g. dashboard)

Share Data

(e.g. send to medical professionals)

Identify Patterns

(e.g. reveal habits/routines)

Communicate

(e.g. message, voicemail, video call)

Switch
(e.g. turn on/off,
play/stop)

Tune
(e.g. volume,
brightness, TV/radio
program)

Voice
(e.g. voice-to-text)

Translate
(e.g. foreign language,
terminology)

Mark Down
(e.g. mood report,
state record)

Actions
(e.g. glow, vibrate,
ring, alarm)

Associate
(e.g. similar
recommendations,
additional info)

Generate
(e.g. melodic pieces,
colors, visuals)

Navigate
(e.g. give direction,
location)

Suggest
(e.g. life hacks/tips,
reminder)

Speed
sustained/sudden
stretching to yawn/
snapping the finger

Flow
free/bound
shaking off water/
pour water into a cup

Notify Others
(e.g. share your state,
report danger)

(A)Synchronize
between multiple
objects (e.g. glow
together/move in
opposite directions)

Weight
light/strong
tapping a digital screen/
making a fist

Space
indirect/direct
scanning a room
for misplaced keys/
pointing to a spot

Affiliation

Social Activities

e.g. volunteer, organize activities or events

Affiliation

Friendship Making & Maintaining

e.g. make invites, in-person activities, follow and respond to updates

Senses, Imagination, Thoughts

Keeping Up with News or Trends

e.g. read news, twitter notification, breaknews alert

Senses, Imagination, Thoughts

Writing

e.g. ideating, drafting, typing

Can you wear/put it on different parts of the body?

Can you interact with it in different gestures/bodily movements?

Practical Reason

Making Plans

Practical Reason

Self-reflection

Emotion

Family Contact

e.g. update recent situations, reassure

Emotion

Visit Relatives

e.g. watch over kids, play with kids, party

Play

Visiting Museums

Play

Knitting

What functions do you want to add to support the activity?

Detect

(e.g. movements, gestures, environment sounds)

Measure

(e.g. weight, length, distance, time span)

Tune

(e.g. volume, brightness, TV/radio program)

How would you interact with it/them?

Elastic Band

Involved Body parts/Other Objects

Wrist, Hair

Metaphor/Figuritive meanings
Flexible,

Gestures/Movements

Belt

Involved Body parts/Other Objects

Pants belt, Bag belt

Metaphor/Figuritive meanings
Flexible

Gestures/Movements

Sticker

Involved Body parts/Other Objects

Paper, collar

Metaphor/Figuritive meanings
Stack, Cluster

Gestures/Movements

Clove

Involved Body parts/Other Objects

Hand, palm, finger

Metaphor/Figuritive meanings
remote touch

Gestures/Movements

Clip

Involved Body parts/Other Objects

Metaphor/Figuritive meanings

Gestures/Movements

Ring

Involved Body parts/Other Objects

Finger,
belt,

Metaphor/Figuritive meanings
Key keeper,

Gestures/Movements

What functions do you want to add to support the activity?

Identify Patterns
(e.g. reveal habits/
routines)

Monitor
(e.g. heartbeats,
blood pressure,
glucose, steps)

Actions
(e.g. glow, vibrate,
ring, alarm)

How would you interact with it/them?

Magnet

Involved Body parts/Other Objects

Metal things

Metaphor/Figurative meanings

like poles repel and unlike poles attract,
compass

Gestures/Movements

Lens

Involved Body parts/Other Objects

Glasses, Magnifier

Metaphor/Figurative meanings

See more clearly, see further, zoom in

Gestures/Movements

Bead

Involved Body parts/Other Objects

Jewelry, String

Metaphor/Figurative meanings

Gestures/Movements

What functions do you want to add to support the activity?

(A) Synchronize
between multiple
objects (e.g. glow
together)

Communicate
(e.g. message,
voicemail, video call)

Notify Others
(e.g. share your state,
report danger)

How would you interact with it/them?

Involved Body parts/Other Objects

Metaphor/Figuritive meanings

Gestures/Movements

Involved Body parts/Other Objects

Metaphor/Figuritive meanings

Gestures/Movements

Involved Body parts/Other Objects

Metaphor/Figuritive meanings

Gestures/Movements

What functions do you want to add to support the activity?

Let's relive the activity

Unpack the sequential sciences

Involvement objects

(what are used? where are they placed?)

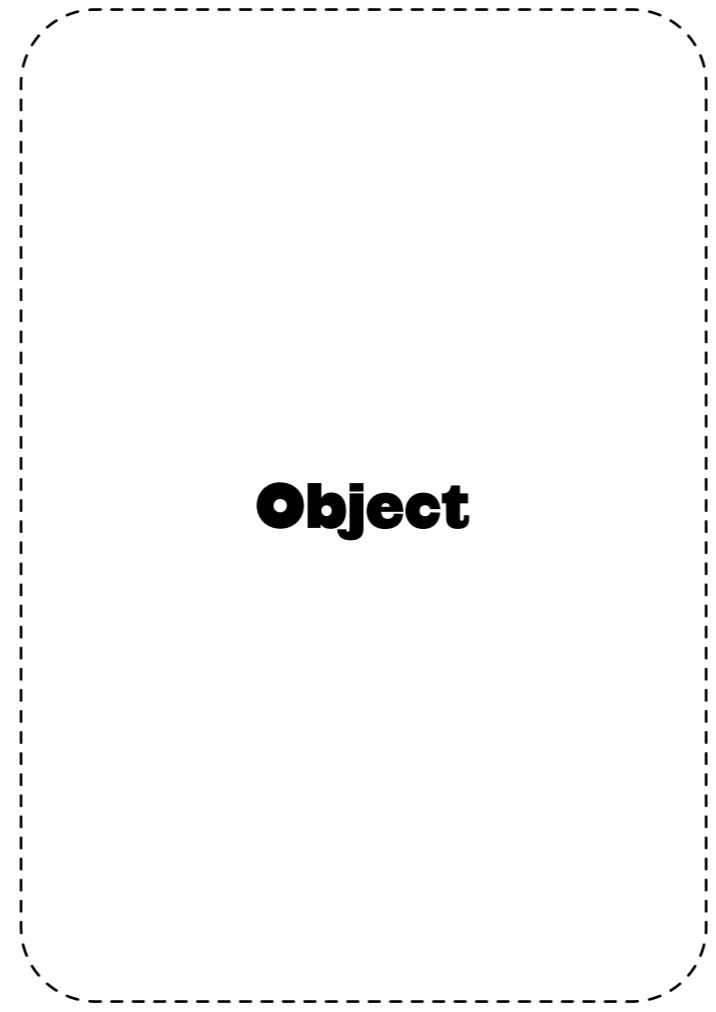
What body movements are involved

Can you enact them?

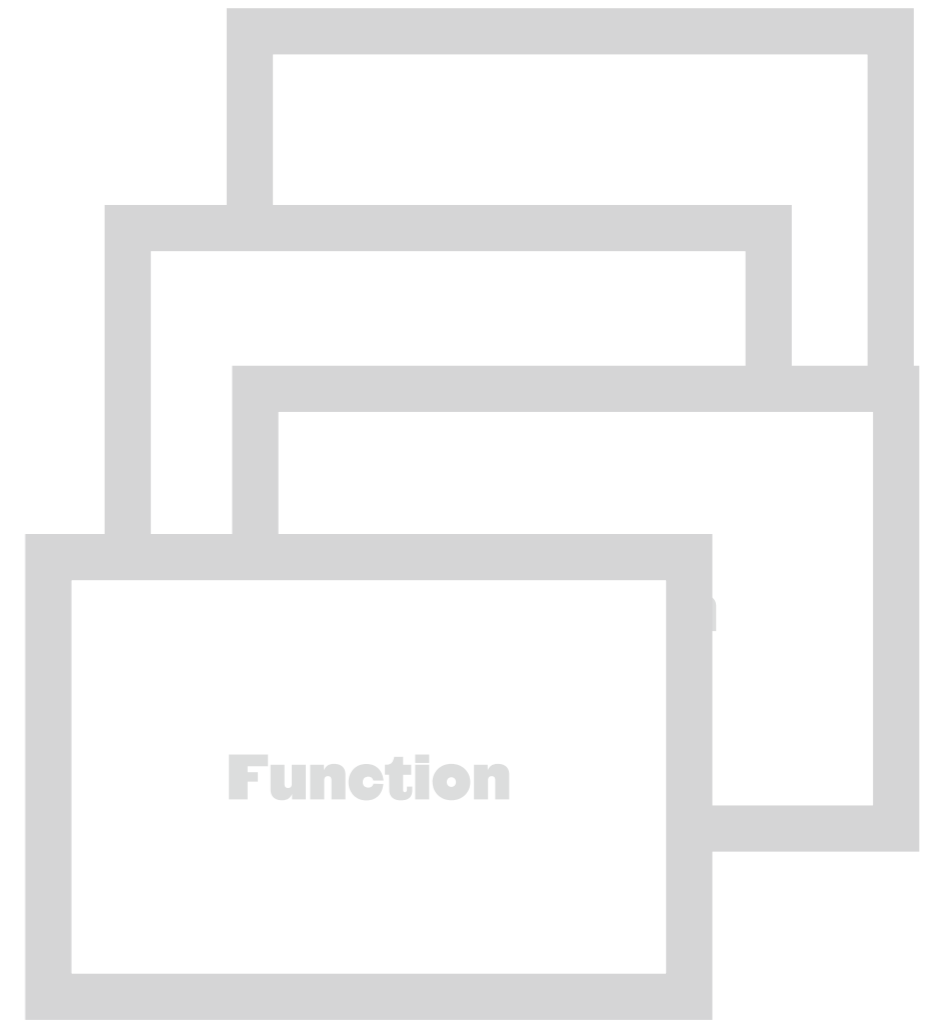
What do you feel challenging



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+



APPENDIX J.



Older Participants

	Anna	John	Tina	Robert	Thoughts
Still images	It's kind of like a sports device. I like the colors.	I like the first lens. It looks modern and elegant. The second ones are like toys for children. Not serious. It might hint at using the timer in situations related to clamps. It can work like a program to remind me to drink water. (14'30")	The aesthetic feeling is nice. (1'52") I think it's a kind of alarm. (3'08")	It looks artistic. It might be used to clamp somewhere to remind you something. (4'33")	
Demo video	The light can be very useful. So that I can use it outside. It can be a reminder for my appointment. It can also remind me to get in touch with my friends. If I clamp it on my grocery list, it can also remind me to go shopping and buy certain things.	It can be put in the refrigerator to remind me of the expiration date. (19'18") It can remind me to take my medicine. (21'02") I can also remind me to take my pills in when I'm busy. I can also remind me to take my pills in when I'm busy. (21'42") I think the 'hour', 'day', and 'week' will be used most and 'month' is too long. (22'36")	Maybe I can use it as the replacement of my agenda. (10'45") I might put it together with my hand bag to remind me when I need to go out to do something. (13'02") I like that it's very small. (13'51") I want to walk up with it. Maybe it can play the radio for me. (14'50") No warning number is applied and convenient. However, it makes you bring one with you to remind you to take your medicine. (15'21") If I have an appointment, I might use it. (16'38")	Demo video	
Extended functions	A reminder to water the plants. House cleaning reminder. Deadline reminder. They might provide a creative structure for my life.	It can be programmed, maybe I can use it to tell my grandson to sleep every evening.	Remind me to buy vitamin pills. When I'm outside and get notified, the app can tell me whether it's something I can address later. (33'12")	Extended functions	
Extra thoughts or questions	Need testing.	I don't want them to be everywhere. It's necessary to use it but it's not necessary to be everywhere. (37'18") It's something to help you, some people might not want others to see it.	(when asked whether it might feel bothering or disturbing)... you will get used to it. (38'05") After a few days or weeks, you get used to see things. You get used to new phone, new radio... You gradually realize it's nice.	Extra thoughts or questions I don't think I need it.	Use scenarios

Designers

	Faye	Libert	Teresa	Hannah
Still images	Medical gadgets. Toy-like. Lovely and light-hearted. A timer. (3'12")	A timer. (2'54") Why a timer is on the clamp? It might hint at using the timer in situations related to clamps. Personally, I often use timer while cooking. But I heavily use clamps while cooking. (3'30") The first concept, combined with timer, brings me a new idea. It's a timer that can be used to remind me to take my pills. (3'42") Another scenario is related to paperwork. Maybe I can remind me in approaching deadline related to my documents. (4'01")	It might be clamped on the book or documents, something like that. (4'47") It might be used to clamp somewhere to remind you something. (4'53") Because it's small it's convenient to carry. (4'55") The colors are bright and vivid and I guess the target users are young. (5'40") Clamp.	Still images I like this because it's clean and minimalist. I'm wondering what the stripes do.
Demo video	A clamp is easily associated with documents or working scenarios. (6'01") It can be clamped with documents associated with a deadline or appointment. (6'19") It can be clamped with my recipe that reminds me to cook certain dishes on certain day. (7'01") It might be integrated with a smart assistant device. For example, a warning device to water the plants. (7'30") Another scenario might be reminding me to drink water. (7'01")	Demo video It might be used to hold food and remind me of the food expiration. (7'18") But I don't know why there is light. I might not use it for deadlines or I might intentionally set the date at least one day before the deadline. (10'18") I often use clamp as an alternative bookmark, so maybe I can be notified back my reading progress. (4'01")	Demo video A timer. (6'12") It might be used like when you're doing time for yourself and take a rest after one hour or so. (6'21") A tool for concentration/productivity. Work-life balance. Let's suppose I have a task to be finished in hours, I will use this to time for myself. (7'23") I need a reminder to remind me of taking medicine that I might use the 'day', 'week', or 'month' clamps. (7'30") The hollow and the light might be aimed to catch my attention or help me shift tasks. (7'50") Personally, I might use them as fidget toys when I need rest.	Demo video A clamp is easily associated with documents or working scenarios. (6'01") It is like a tangible reminder that is alternative to the digital one on my phone. (6'49") Does reminding me of the expiration date count? Especially for the food that expires soon. I often forget. (7'26") It can be clamped with my post-it with to-dos. (7'55") It can be used as an alarm clock. My lunch break is up.
Extended functions	It can be used to clamp the food expiration date and the food expiration date. Because it might not be clear when in the cupboard. (1'18") Remind me to do cleaning.	Extended functions It can be clamped with my keys to remind me to go somewhere or help me find my keys. (10'56") It feels like many possibilities. (11'04")	Extended functions I might use them to remind me of taking medicine that I might use the 'day', 'week', or 'month' clamps. (7'30") I might put them in a line and let them make different sounds. (12'58")	Extended functions Timing while I'm studying. (8'47") I don't think it's suitable to present in the public, it's disturbing in an official meeting. (8'50") It makes me think of Apple's AirTag. (12'44") Maybe a reminder to take medicine for some people with chronic diseases. (13'07") It's kinda difficult for me to think of use scenarios. Maybe because I'm not a user myself, I'm just a designer. Instead of using it for a period of time. (13'48")
Extra thoughts or questions	Concern about the cost. (16'24") If I'm going to use them in my daily life, I might use them frequently and I might need a large amount of them. Concern about the potential extra efforts. (17'20") Do I need to charge them frequently? Will that cost me too much time?	Extra thoughts or questions Why do you adopt the form of a clamp? (11'24") Why is the minimum time unit 'hour' but not 'minute'? (11'40")	Extra thoughts or questions I'm wondering who are the target users? Why they will use it? For what? Is it easy and intuitive enough to use? What the app on the phone will bring extra burden on user? How long I can use it. Because this type of devices are fast-moving consumer goods in my impression. And it's associated with being easily broken. Feasibility issues. Charging? Too small to embed chips? I might not use them everywhere but only for most important things (keys, glasses, phone, etc).	Extra thoughts or questions Who is the target user (is it for older adults)? (14'48")
Dynamic feedback		Dynamic feedback	Dynamic feedback Is the intentional use of bright colors and the purposes, if it's for attracting attention, using bright colors make a lot of sense. I think this design strategy is applicable to branding design fusion and stimulating more ideas. (13'30") What should be wary of is 'overdesign'. (39'40")	Dynamic feedback I think a warning device is not necessary. Because it's not a user myself, I'm just a designer. Instead of using it for a period of time. (13'48")

APPENDIX K.



Practical Reason

It can be clamped with my post-it with to-dos. (7'55")

If I have an appointment, I might use it. (16'38")

I might put it together with my hand bag to remind me when I need to go out to do something. (13'02")

Bodily Health

Does reminding me of the expiration date count? Especially for the food that expires soon, I often forget. (7'25")

Remind me to buy vitamin pills.

I want to wake up with it. Maybe it can play the radio for me. (14'50")

It can work like a program to remind me to drink water. (14'36")

Life

It can be clamped with my recipe that reminds me to cook certain dishes on certain day. (7'01")

My washing machine is upstairs and sometimes I forget it. Maybe I can bring one with me to remind me to hang out the washing. (15'40")

I might use it to remind me to change my toothbrush or bedsheets. (17'38")

Senses, Imagination, Thoughts

Timing while I'm studying. (8'47")

I often use clamp as an alternative bookmark, so maybe it can be used to track my reading progress. (4'01")

I might also use them to organize my files. If it's connected with my phone, I can search it and it will light up or ring when I need to find it. (10'24")

Emotion

It can also remind me to get in touch with my friends.

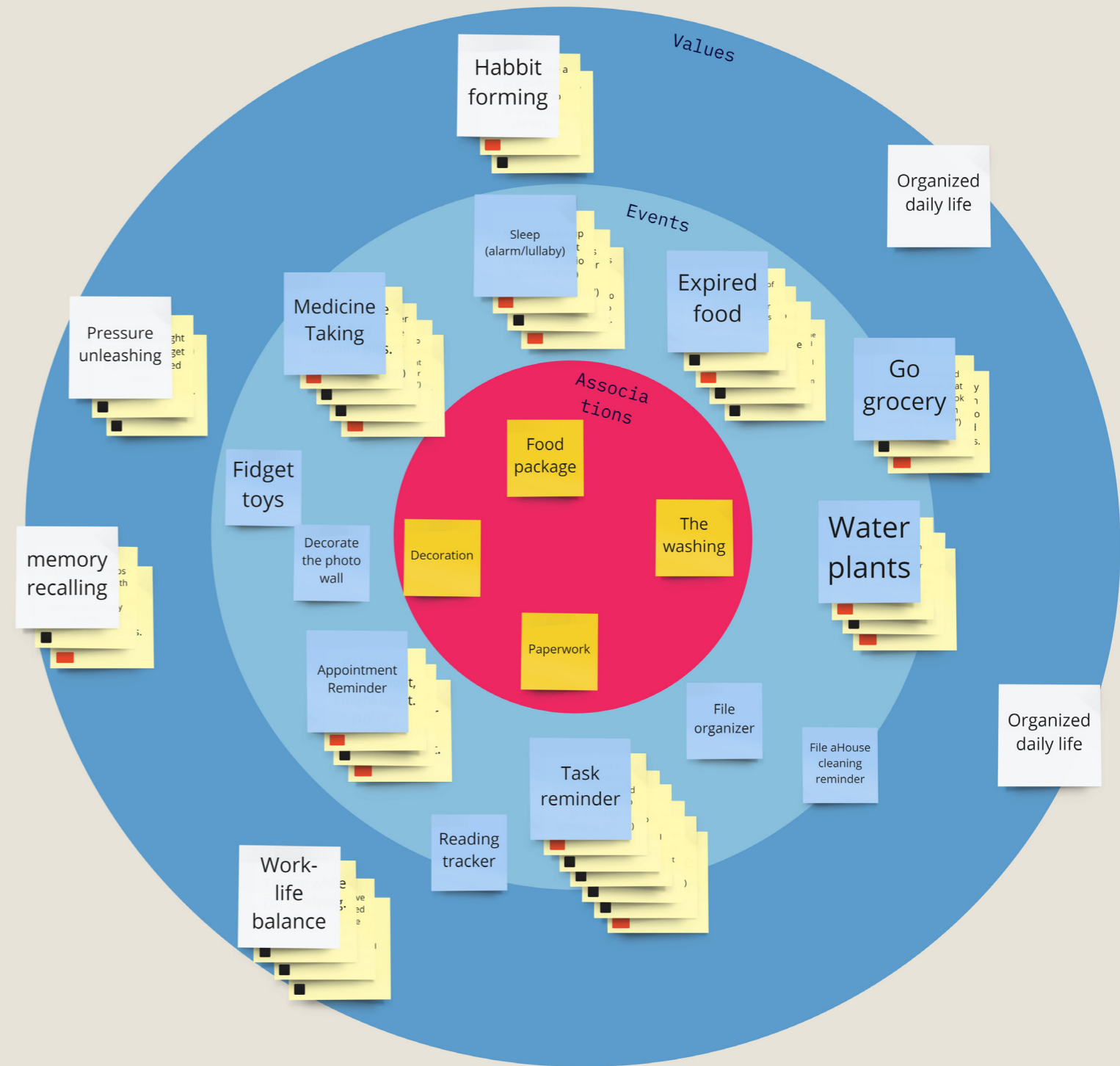
I might use it to clamp some photos and remind me of the special dates/anniversary dates.

Play

Personally, I might use them as fidget toys when I need rest.

Other Species

It can also remind me to water my plants in certain frequency. It's hard for most people to remember how frequent to water each plant. (21'44")



APPENDIX L.



Dear participant,

You are being invited to participate in a research study titled *Exploring Intelligent Wearable Technologies through Speculative Design*. This study is being done by *Yu Huang* from the TU Delft.

The purpose of this research study is to explore the relationship between intelligent wearable technologies and humans in the context of the well-being of elderly people and will take you at most **90 minutes** to complete. The data will be used for analysis and understanding elderly people's daily challenges, needs, and desires. We will be asking you to attend **an audio-recorded interview**.

As with any online activity the risk of a breach is always possible. To the best of our ability your answers in this study will remain confidential. We will minimize any risks by collecting as little as possible personal data and completely anonymizing your personal data. Raw data of the interview will be safely stored in OneDrive provided by TU Delft. **Audio recordings** will be transcribed into anonymized texts as soon as the interview is finished and will be destroyed afterwards. **Few pictures** will be taken during the process for demonstrating the research activities in the report. Front facing shots will be avoided. If applicable, all faces will be blurred in the photo.

Your participation in this study is entirely voluntary **and you can withdraw at any time**. You are free to omit any questions. In order to ensure a clear demonstration of this consent, please fill up the explicit consent form attached below.

Feel free to contact the researcher

Sincere,

Yu Huang

Industrial Design Engineering, TU Delft

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICIPANT TASKS AND VOLUNTARY PARTICIPATION		
1. I have read and understood the study information, or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	<input type="checkbox"/>	<input type="checkbox"/>
2. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	<input type="checkbox"/>	<input type="checkbox"/>
3. I understand that taking part in the study involves: [see points below]	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> An interview in person an audio recording and written notes of the interview a transcription of the audio recording as texts few pictures taken during the process to demonstrate the conduction of the workshop 		
4. I understand that the study will end in 90 minutes.	<input type="checkbox"/>	<input type="checkbox"/>
B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)		
5. I understand that taking part in the study involves potentially distressing discussion. I understand that these will be mitigated by emotional support and the right to stop the activity at any time.	<input type="checkbox"/>	<input type="checkbox"/>
6. I understand that the following steps will be taken to minimise the threat of a data breach, and protect my identity in the event of such a breach.	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> anonymous data collection secure data storage a transcript of the audio recording deletion of the audio recording after transcription blurring of faces/avoiding front facing shots 		
7. I understand that personal information collected about me that can identify me, such as <i>my name or where I live</i> , will not be shared beyond the study team.	<input type="checkbox"/>	<input type="checkbox"/>
8. I understand that the (identifiable) personal data I provide will be destroyed after the transcription is finished.	<input type="checkbox"/>	<input type="checkbox"/>
C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION		
9. I understand that after the research study the de-identified information (mainly quotes) I provide will be used for [see points below]	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> graduation project reports portfolio potential publications 		

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
10. I agree that my responses, views or other input can be quoted anonymously in research outputs	<input type="checkbox"/>	<input type="checkbox"/>
11. I understand that written information I provide will be scanned.	<input type="checkbox"/>	<input type="checkbox"/>
D: (LONGTERM) DATA STORAGE, ACCESS AND REUSE		
12. I give permission for the de-identified quotes that I provide to be archived in TU Delft repository so it can be used for future research and learning.	<input type="checkbox"/>	<input type="checkbox"/>
13. I understand that access to this repository is restricted only to TU Delft campus.	<input type="checkbox"/>	<input type="checkbox"/>

Signatures

Name of participant [printed]

Signature

Date

I, as researcher, have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.



Yu Huang

2022/04/27

Researcher name [printed]

Signature

Date

Study contact details for further information:



IDE Master Graduation

Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

! USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT

Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

STUDENT DATA & MASTER PROGRAMME

Save this form according the format "IDE Master Graduation Project Brief_familyname_firstname_studentnumber_dd-mm-yyyy". Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 !

family name	<u>Huang</u>	<u>5672</u>	Your master programme (only select the options that apply to you):
initials	<u>Y.</u>	given name <u>Yu</u>	IDE master(s): <input type="radio"/> IPD <input checked="" type="radio"/> Dfl <input type="radio"/> SPD
student number	<u>5291208</u>		2 nd non-IDE master: _____
street & no.	_____		individual programme: _____ (give date of approval)
zipcode & city	_____		honours programme: <input type="radio"/> Honours Programme Master
country	_____		specialisation / annotation: <input type="radio"/> Medisign
phone	_____		<input type="radio"/> Tech. in Sustainable Design
email	_____		<input type="radio"/> Entrepreneurship

SUPERVISORY TEAM **

Fill in the required data for the supervisory team members. Please check the instructions on the right !

** chair	<u>Marco Rozendaal</u>	dept. / section: <u>HCD-HICD</u>
** mentor	<u>Maria Luce Lupperti</u>	dept. / section: <u>HCD - HICD</u>
2 nd mentor	<u>Janna van Grunsven</u>	
organisation:	<u>TU Delft TPM (Values, Technology and Innovation)</u>	
city:	<u>Delft</u>	country: <u>Netherlands</u>

comments
(optional)

⋮

Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v..




Second mentor only applies in case the assignment is hosted by an external organisation.



Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

APPROVAL PROJECT BRIEF

To be filled in by the chair of the supervisory team.

chair Marco Rozendaal date 31 - 03 - 2022 signature 

CHECK STUDY PROGRESS

To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair. The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total: 28 EC

Of which, taking the conditional requirements into account, can be part of the exam programme 26 EC

List of electives obtained before the third semester without approval of the BoE

YES all 1st year master courses passed

NO missing 1st year master courses are:

C. van der Bunt
Digitally signed by C. van der Bunt
Date: 2022.04.19 17:50:57 +02'00'

name C. van der Bunt date 19 - 04 - 2022

signature C. van der Bunt

FORMAL APPROVAL GRADUATION PROJECT

To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked **. Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

- Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?
- Is the level of the project challenging enough for a MSc IDE graduating student?
- Is the project expected to be doable within 100 working days/20 weeks ?
- Does the composition of the supervisory team comply with the regulations and fit the assignment ?

Content: APPROVED NOT APPROVED

Procedure: APPROVED NOT APPROVED

comments

name Monique von Morgen date 26 - 04 - 2022

signature _____

Exploring Intelligent Wearable Technologies through Speculative Design project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date 31 - 03 - 2022 12 - 08 - 2022 end date

INTRODUCTION **

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

The rising and prevalence of technologies like artificial intelligence has deeply and irreversibly changed the way we live. Within the context of everyday use of technological artifacts, smart wearables (e.g. fitbits, AR/VR glasses, etc.) are on top of the list. These objects are so close to our body when we are using them, in such we can even see them as the extension of our body in some way. Due to this kind of intimacy and closeness, we are most likely to be deeply influenced by those devices even without notice. They are entangled with how we interact with the world and others. This situation renders it imperative to gain deep understanding of the relationship between humans and those technological artifacts.

From an enactive perspective, our perception towards the smart wearables is shaped through a dynamic interaction between us and the artifacts. In that, the relationship between us and the artifacts is not fixed but constantly shaped by the interactions. Enactivism provides a useful descriptive perspective on what it means to be a living embodied agent who enters into hybrid relationships with other entities, therefore it helps understand how people frame the artifacts and what the related design features might influence people's framing.

The rapid development of technology often outpaces the development of related rules and regulations. This might lead to the misalignment between the value of technological artifacts and human values. Ethical issues like the misuse of user data are looming close by. Based on the analysis on how people frame technological artifacts, insights about how ethical implications are tied into people's framing and the design features that underlie them will be explored. I see this as the main contribution of this project - providing a design guideline for designing technological artifacts in a more socially good way.

This project will be a collaborative one between Expressive Intelligence Lab(EIL) in IDE faculty and TPM faculty. The previous design research collective will be referred to as a support for doing speculative design in the context of cutting-edge technology while the mentor from TPM will provide the theoretical support on the topic related to ethics and technology.

The main stakeholders in this project will be the elderly people. More and more elderly people or their caregivers are relying on technologies like smart wearables for the use of healthcare management. Elderly people are often stigmatized these days which are mistakenly assumed to be helpless and frail. This project wishes to tap into the unique resourcefulness of the elderly thereby sparking their inventiveness.

Main opportunities of this project would be the potential of, even if partially, understanding the underlying mechanism of how people differently frame the smart wearables and how designers can purposefully design for a beneficent technology use. There is also an opportunity to demonstrate how speculative design can both facilitate research and translate theoretical knowledge across different disciplines into an engaging experience that can provoke thoughts. Limitations mostly relate to language and technology. How to realize the interaction and how much part of it needs to be successfully implemented that can be enough to stir discussions and generate insights will be explored and tested within the project.

space available for images / figures on next page

introduction (continued): space for images

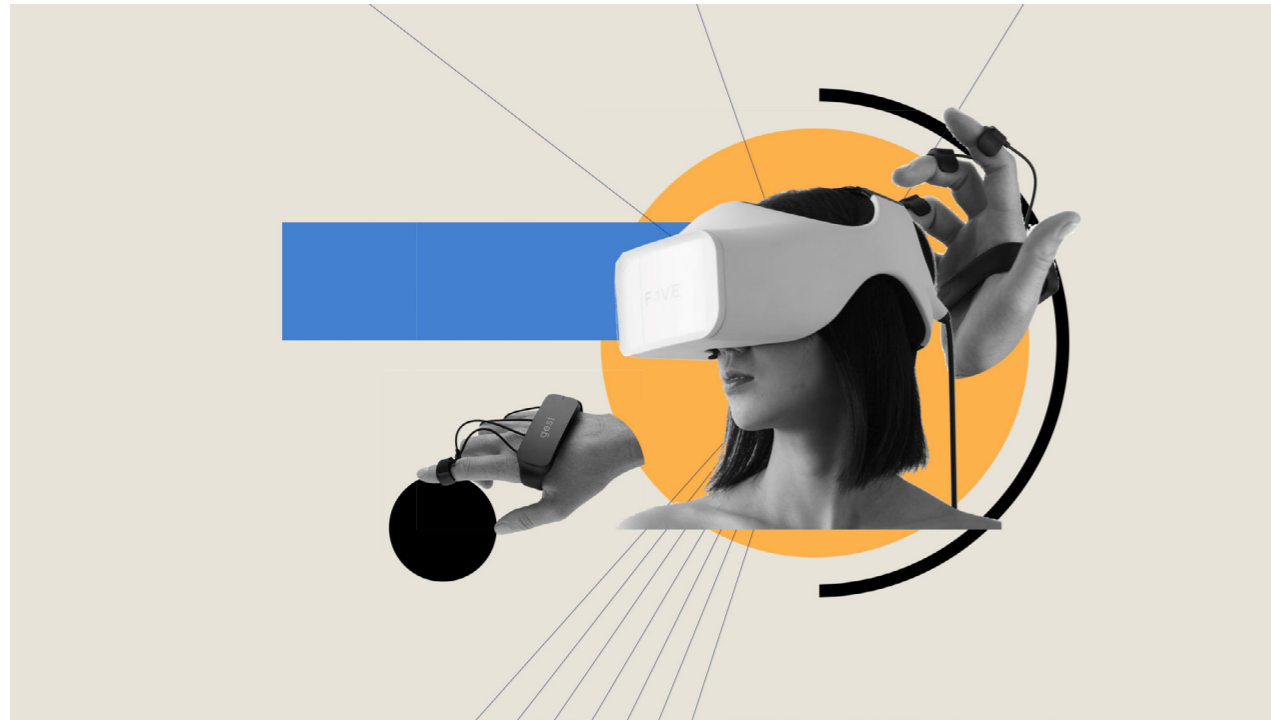


image / figure 1: Exploring smart wearable technologies through speculative design

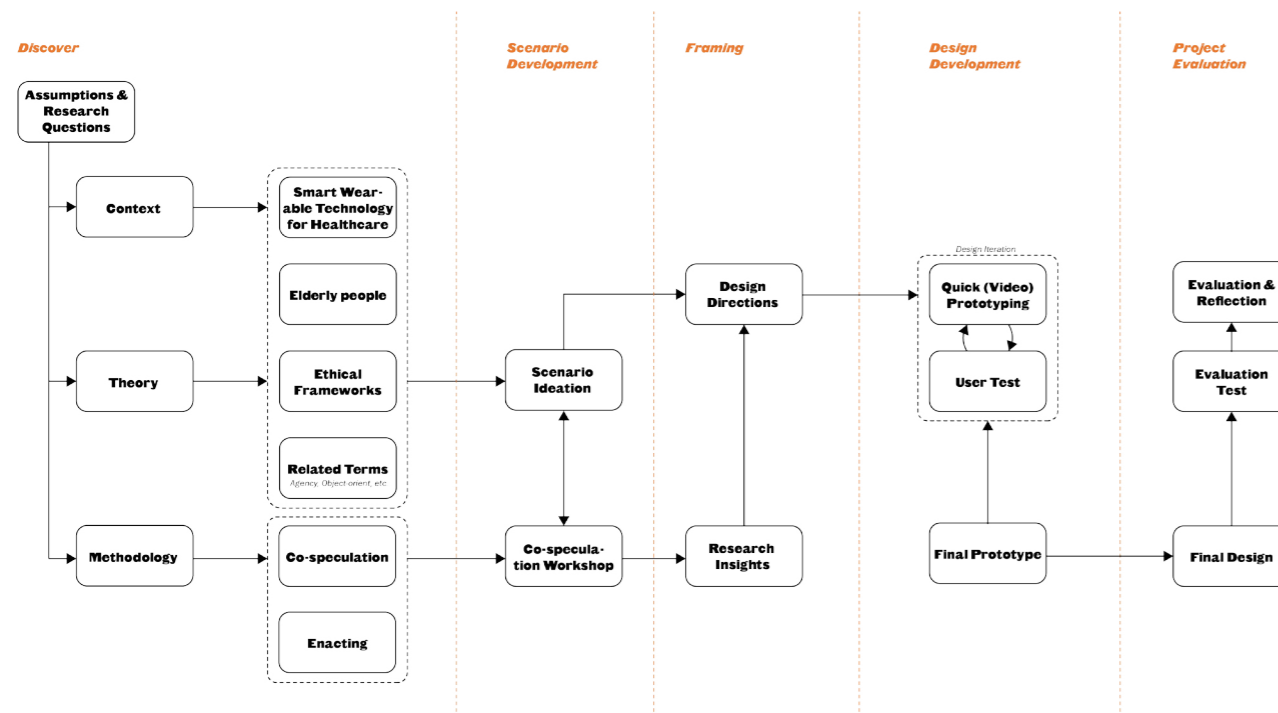


image / figure 2: Project overview

PROBLEM DEFINITION **

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

Technology has been penetrating our daily life. The prevalent use of technology makes its impact on us large-scale. Though we have already seen the bright side of technology which makes our life much more convenient and easier, we still need to be wary of the dark side. The development of related rules and regulations are often lagged behind the rapid development of technology. This might engender many ethical issues we don't foresee right now. It is necessary to raise people's awareness of the ethics of technology.

Within the context of healthcare, more and more elderly people are using smart wearables for monitoring and detecting physiological measurements or managing their daily life. How humans frame those technological artifacts hasn't been fully investigated. In that, it is imperative to understand the way people frame the technology artifacts and how ethical issues are related to the framing process. More importantly, it is of great concern for design practitioners to understand how to design for a more meaningful relationship between humans and technological artifacts.

ASSIGNMENT **

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

The expected outcome of the project would be several design fictions that can provoke thoughts around ethical issues of smart wearables for stress management. The analysis of the interaction between people and the speculative artifacts will yield design implications for technological artifact design practices.

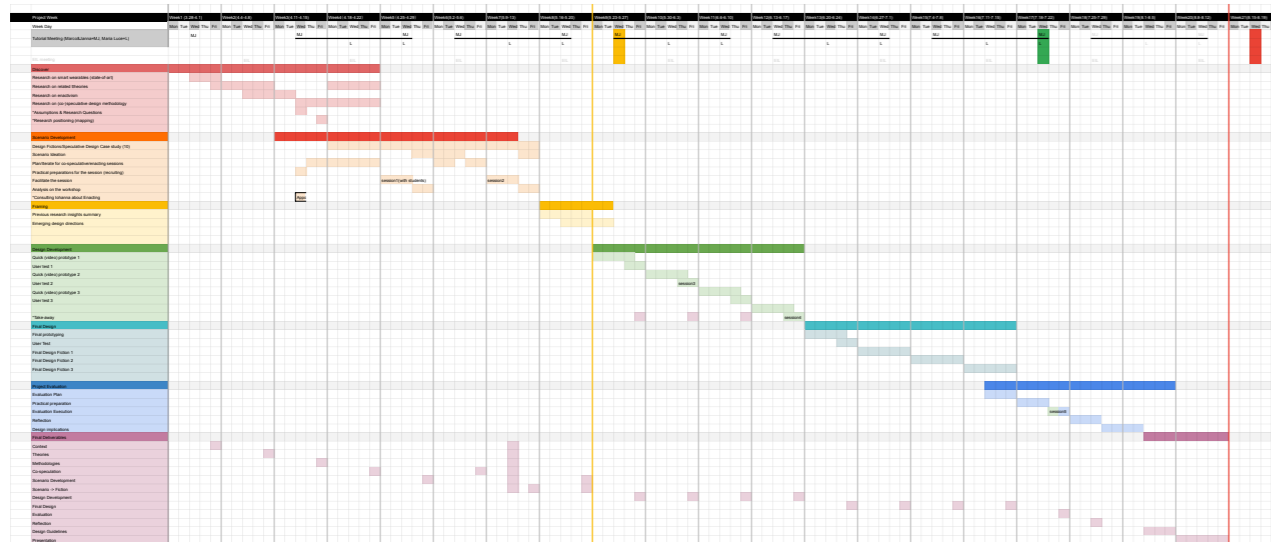
This project will use the research-through-design methodology. A general review on smart wearables concerning the state-of-the-art and ethical challenges will be conducted as a starting point to understand the current status. It will provide a theoretical base for further ideation of the appropriate design fiction scenarios.

Speculative design methods will be deployed as a way to actuate the abstract future and trigger people's true responses while interacting with speculated technological artifacts. The design fiction will serve both as means - to deeply understand people's framing process - and as ends - that sheds some light on the ethical challenges of smart wearables. The in-depth understanding of the process of framing will finally lead to design implications that will guide design practitioners to design in a more socially good way.

PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date 31 - 3 - 2022 12 - 8 - 2022 end date



This project will be conducted along the basic double-diamond design process interluded with 5 workshops, among which three will be official one conducted with the target group and two will be pilot ones conducted with peer students. The participatory co-speculative workshops are the backbone of the design research. Two workshops facilitated before the mid-term will be aimed to identify the design scope and design goal. Another two workshops conducted after the mid-term will be the input for observing the artifact-human interactions and yielding design implications. The last workshop conducted in the last phase is expected to provide validations from two aspects. The first one is the methodological aspect. The test will assess to what extent different types of fictions (e.g. exhibit-like, or engaging) can provoke people's thoughts. Another aspect is concerned with the design of smart wearables itself. The test will assess how much the design guidelines can facilitate eliciting desired interactions between humans and technology. The project will culminate in an accordingly two-fold reflection on the research-through-design methodology and the design implications.

MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, Stick to no more than five ambitions.

Motivations:

During the first year of study, I acquired hands-on knowledge of conducting context mapping, user research, user tests, quick prototyping and iterating through various project-based courses (e.g. Exploring interaction). I also gained the theoretical knowledge about different design methodologies from the course Design Theory and Methodology, in which our group specifically focused on the topic of speculative design. Besides, in the course DFI Research Methodology, I was on the track of alternative methodology (i.e. research through design) where our group utilized co-speculative workshops to generate insights for the desired future of recommender systems in YouTube. Alongside these, I also enrolled several courses related to the topic of ethics and technology including Society and AI and Deep Dive (Q3 topic: more-than-human-centered design). They can provide me with broad and solid theoretical base on this topic.

Personal ambitions:

- To gain in-depth theoretical knowledge on the topic about philosophy of technology
- To improve my ability to facilitate generative sessions
- To sharpen my ability of rapid prototyping
- To acquire the academic writing skill

FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.