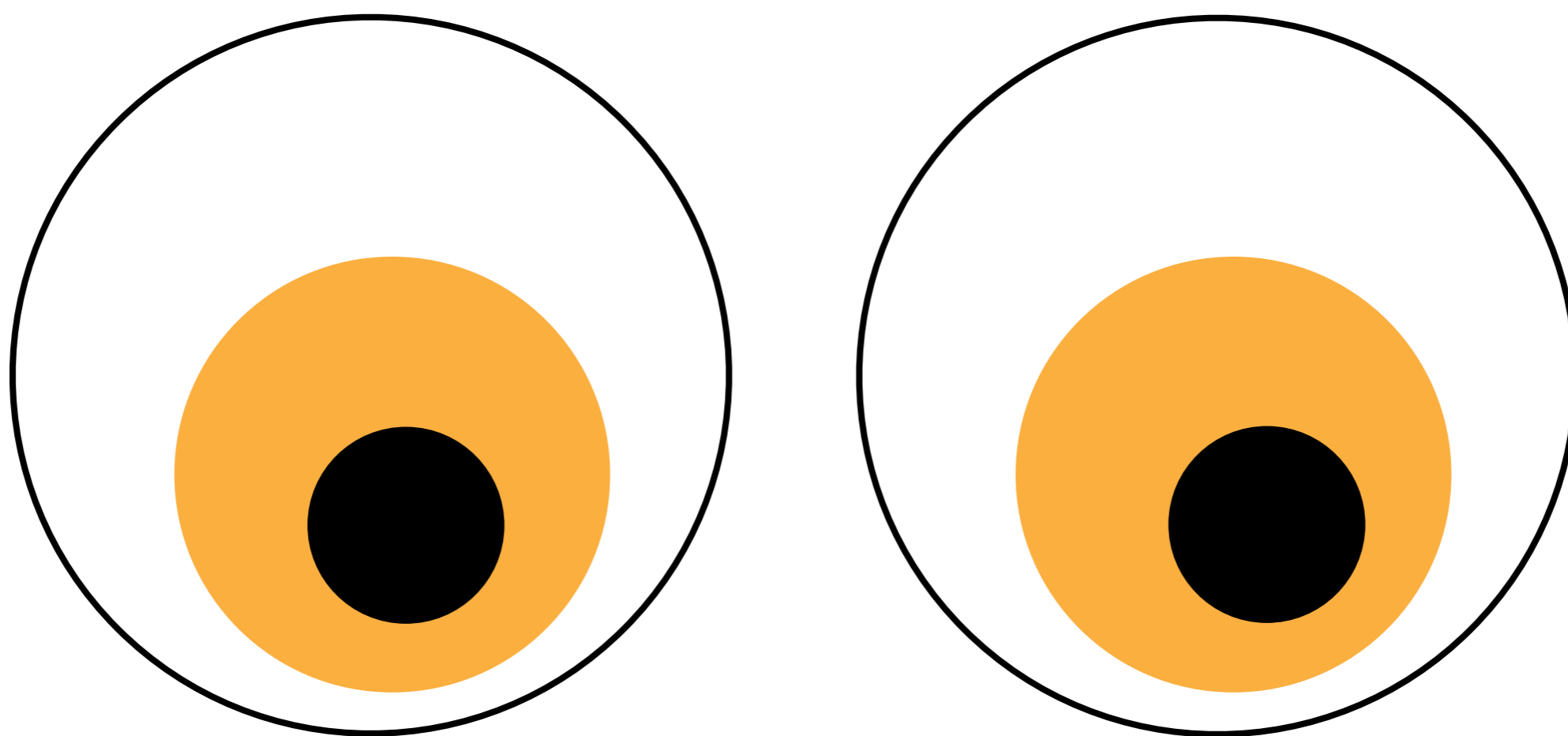*What are the awareness, attitudes and acceptance levels amongst the general public to vision augmentation technologies?*

FINAL *MAJOR PROJECT*

MASTER THESIS

STUDENT	*KATARZYNA HAŚNIK*
SUPERVISOR	*DR HILARY KENNA*

MASTER OF ARTS	*DESIGN FOR CHANGE*
IADT	*INSTITUTE OF ART, DESIGN AND TECHNOLOGY*

Dedicated to our precious eyes.

- Katarzyna Haśnik

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DESIGN WHAT MATTERS.
Design for Change Matters.

Thank you to all who take part in creating this path.

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What are the awareness, attitudes and acceptance levels amongst the general public to vision augmentation technologies?

RESEARCH
QUESTION

ABSTRACT
SUMMARY

The aim of this research is to investigate, awareness, attitudes and levels of acceptance to the enhancement of the human eyesight by using augmentative technologies for both need (e.g. health) and desire (e.g. entertainment/aesthetics).

GENERAL TERMS
HUMAN FACTORS

CONCEPTS
SOCIAL STUDIES

Discovery of the attitudes and acceptance levels amongst the general public to sight augmentation technologies: assistive technologies for the visually impaired and technologies such as digital screen devices, Virtual Reality headsets, and Augmented Reality heads-up displays.

KEYWORDS
MAJOR TOPICS

Public, Awareness, Attitudes, Eyesight, Visually Impaired, Human Augmentation Technologies, Accessibility Technologies, Virtual Reality headsets, Augmented Reality heads-up displays, Human-Centre Design.

The precarity of it and impact of life.

ABSTRACT
CONCEPTS

*Eyesight is the most important of our
sensory systems for optimal
daily activities and overall* **survival**

- Najam A. Sharif

The rationale for this research project is based on the discovered studies of an increasing number of visually impaired people globally conducted by the World Health Organization as well as nationally by the National Council for Blind in Ireland, which said: at least 2.2. billion people are visually impaired (WHO). In the Republic of Ireland 55.000, are visually impaired and 2.250 are completely blind (NCBI).

The number of waiting patient ophthalmic services in Ireland is 46310 adults (NCBI).
The main factor in decreasing the sense of vision is natural ageing. Mostly impacted adults in their 50s (WHO, NCBI).

According to the Central Statistic Office, 2016, the population over 65 is increasing in Ireland by 19.1% in comparison to the population between 25-64 increased by 1.9% (CSO).

At the same time, estimated productivity losses in 2022 associated with vision impairment are $411 (WHO).

The Computer Vision Sumdomr diagnosis and treatment costs in the USA ¢2 billion every year (Blehm, Vishnu, Khattak, Mitra, Yee 253-262).

The cost of vision assistive technologies production needs to increase due to the need of visually impaired people. WHO claimed that half of the number of visually impaired people could be prevented when acting accordingly (WHO).

While at the same time, the number of jobs including the computer in The United States of America is 75% compare to the job with no digital screen (Blehm, Vishnu, Khattak, Mitra, Yee 253-262).

According to the research conducted by the National Institute of Occupational Safety and Health in Malaysia 70.6% number of workers using computers complained of eye strain caused by Computer Vision Syndrome (Loh, Reddy 128-130).

Furthermore at the same time usage of vision augmentation technologies such as Virtual Reality and Augmentative Reality headsets is growing. Zion Market Research predicted VR sales reach $ 26.89. ARtillary Intelligence $18.8 for 2022 (Greengard 1-18).

The academic literature review discovered the gap in the lack of conducted research studies to investigate the awareness, attitudes and acceptance levels amongst the general public of vision augmentation technologies.

The aim of this research is to contribute to finding out insights into the research question by focusing on the public and their usage of digital screen devices such as computer desktops laptops, mobile phones, tablets, e-readers, Virtual Reality headsets and Augmented Reality head-up display for personal and professional. While at the same time awareness of Vision Assistive Technologies testing for visually impaired people listed but not limited to white canes, guide dogs, Braille displays, prints, phones with large tactical buttons, talking devices, screen reading software.

RATIONALE
HYPOTHESIS

AIMS OBJECTIVES
PROJECT & PERSONAL

PROJECT AIMS

The project was chosen to focus on the vision augmentation technologies and the corresponding public awareness, attitudes and acceptance worldwide with a focus on Ireland, the United Kingdom, Union Europe, and beyond mainly North America to first hear and understand the public and then be able to help, support, and educate within the research findings the public itself by providing data from the research to the public, non-profit organisations, government bodies, health sector, and technology companies.

It is important to explore the existing relationship of the public with vision augmentative technologies including vision assistive technologies and eyesight itself as the predominant sense.

The aim is to assist the public by giving them a space to express their opinions and feelings about digital screen devices, and the eyesight.

It is significantly important to contribute to the public itself through the research and potential solution product design proposal depending on the insights of the primary and secondary research.

The major aim is to discover, define, help, support and potentially bring a good change by establishing communication with the general public and the corresponding stakeholder ecosystem.

The major aims and objectives are summarised as follow:

1. Explore predominant reasons for low vision and loss of eyesight.
2. Discover the key factors by reviewing existing statistical and factual information.
3. Understand the types of visual impairment.
4. Research government regulations towards augmentative technologies of vision.
5. Discover predictions in costs, and numbers globally and in Ireland.
6. Explore the effects of on-screen technologies on human vision.
7. Discover and analyse People's awareness, attitudes to and acceptance of assistive technologies for the visually impaired and Virtual Reality headsets, Augmented Reality head-up display technologies.
8. Analyzed collected data from the public to contribute to the research on the subject.
9. Establish effective conclusions.
10. Explore design solutions in products and services based on the collected insights.
11. Tests, collect feedback, improve and develop further to help, support, inspire and motivate a good change as per public needs, values, motives and goals.
12. Implement valuable contributions to the public in the near future by developing further the products within practical testing.

PERSONAL AIMS

Health and education always had been of major importance in my personal and professional life. Active listening to others is highly important to me, to be able to understand first and then design for a better. I believe to approach my career as a researcher and designer for the health sector on a more advanced level with a specialisation of the human sense of vision.

During my master's degree, I gained many new skills and valuable knowledge on how to research the subject to meet the criteria for non-profit organisations, government bodies and for profit to make a real impact, the change which matters.

I learned how I can support the public domain by tackling the research questions based on the discovered gaps in previous academic research. By collecting and analysing new data provided by the public in my research I can help effectively.

While investigating the various design process and methods, and testing the most suitable I learn how to be selective and better organised to stay focused to approach the research question effectively, I have learned to evaluate the project design plan within the timeframe and in a structural strategic way to support my aims and objective of the project.

I learnt to optimise and incorporate what is relevant by reducing certain tools and content.

It was a challenging process but at the same time truly inspiring, motivating and rewarding both professionally and personally.

My values, mission, goals, and reasons became much more defined with each step. The question WHY? I am doing, for who and how became clearer. Facilitating Charrette workshops with a group of open-minded and helpful participants, IADT students with who we established common values, and goals helped me to prioritise the area on which I want to focus as the final one. It helped me as well by receiving feedback to improve my leadership and facilitation skills.

I set my goals clearly at the beginning to engage with the public domain in my primary research phase within the subject of interest of human augmentation and emerging technologies.

With valuable feedback from supervisors and advisors, my initial aim changed from the smart prosthesis to bionic limbs across posthumanism due to ethics and constraints such as timing and access.

The thesis finally emerged within the vision augmentation technologies, which was linked as shared with my supervisors to my final Bachelor's Honours degreeproject in design which was dedicated to elderly, lonely and visually impaired, blind people to increase awareness of the public of those vulnerable groups. This project's strategy and design results were different and more focused on graphic design, communication and visual design, and photography.

It did include assistive technologies and was dedicated to public and non-profit charities and visually impaired people. My grandmother Zofia Imiołek was the model together with other elderly people in the testing phase.

I wish to specialise as a research designer and provide more design for this area of expertise.

This project links to my career as a UX/UI and Graphic Designer in the educational sector, medical, pharmaceutical, holistic, well-being and health sectors as well as with my secondary profession in wellness, holistic health, yoga, active sports qualification and lifestyle including working directly with a variety of people with different disabilities including vision impairment.

I set my clear path to focus on the public domain by maximising time to reach as many as possible participants of the survey. Interviewing companies and organisations I decide to keep the Next Steps to first have a solid foundation from public research studies, which was strategically shared and approved by my supervisor.

The successful number of participants taking part in the survey anonymously and openly sharing contact details helped me to build up confidence and support my rationale and contributed to filling the discovered gaps in the peer's paper reviews of the secondary research, and literature review. It also helped me to get real insights into the challenges which people do have within

eyesight and their exposition to digital screens, while at the same time honest opinions about emerging augmented technologies and experiences with assistive technologies and the visually impaired. Now I am closer to knowing what the public domain thinks and feels. I am grateful for it a lot.

Many participants shared their contact and willing to be contacted for further studies which I am looking forward in the next steps.

I also received positive feedback and my interest in the topic was great which of course increased my motivation.

My Master of Arts, Design for Change journey for the last almost one year and a half, 16 months, since September 2021 has been truly engaging and inspiring as I learnt a lot and developed personally and professionally. All parts of this journey were beneficial. Exploration of various topics helped me to gain what I really want to do next with my design career.

I believe that this thesis will become a vocal point in vision augmentation technologies for the public and it will make a postive difference.

SECONDARY RESEARCH
LITERATURE REVIEW

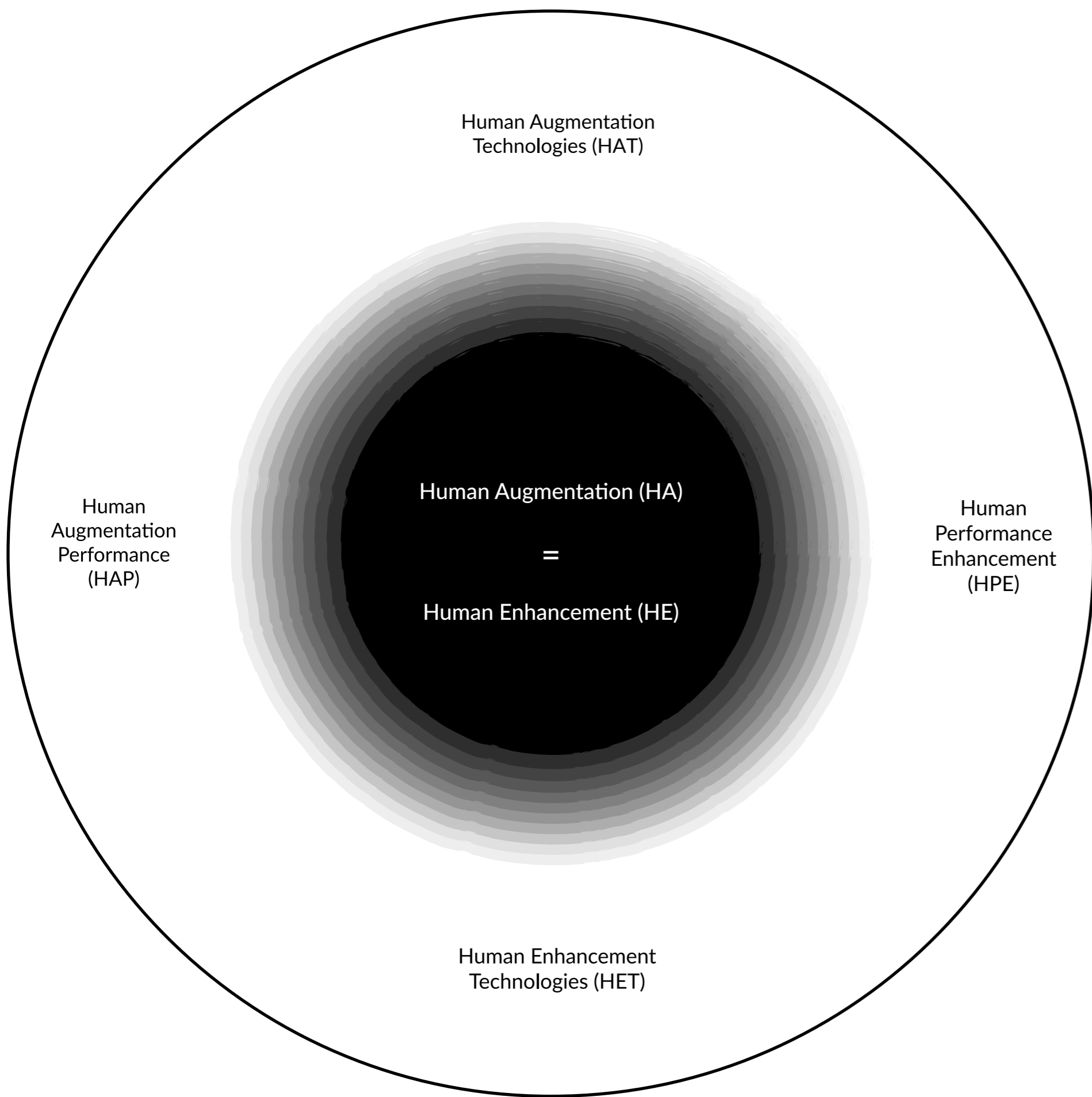Fig 1. Human Augmentation Synonymous. All terms are used interchangeably without major distinguishing differences and cover the past, present or future as the potential for upcoming products, services, activities and practices.
Source: Bostrom, Savulescu 1-18, Coenen, Smits, Klaasse, Hennen, Rader, and Wolbring 6-20.
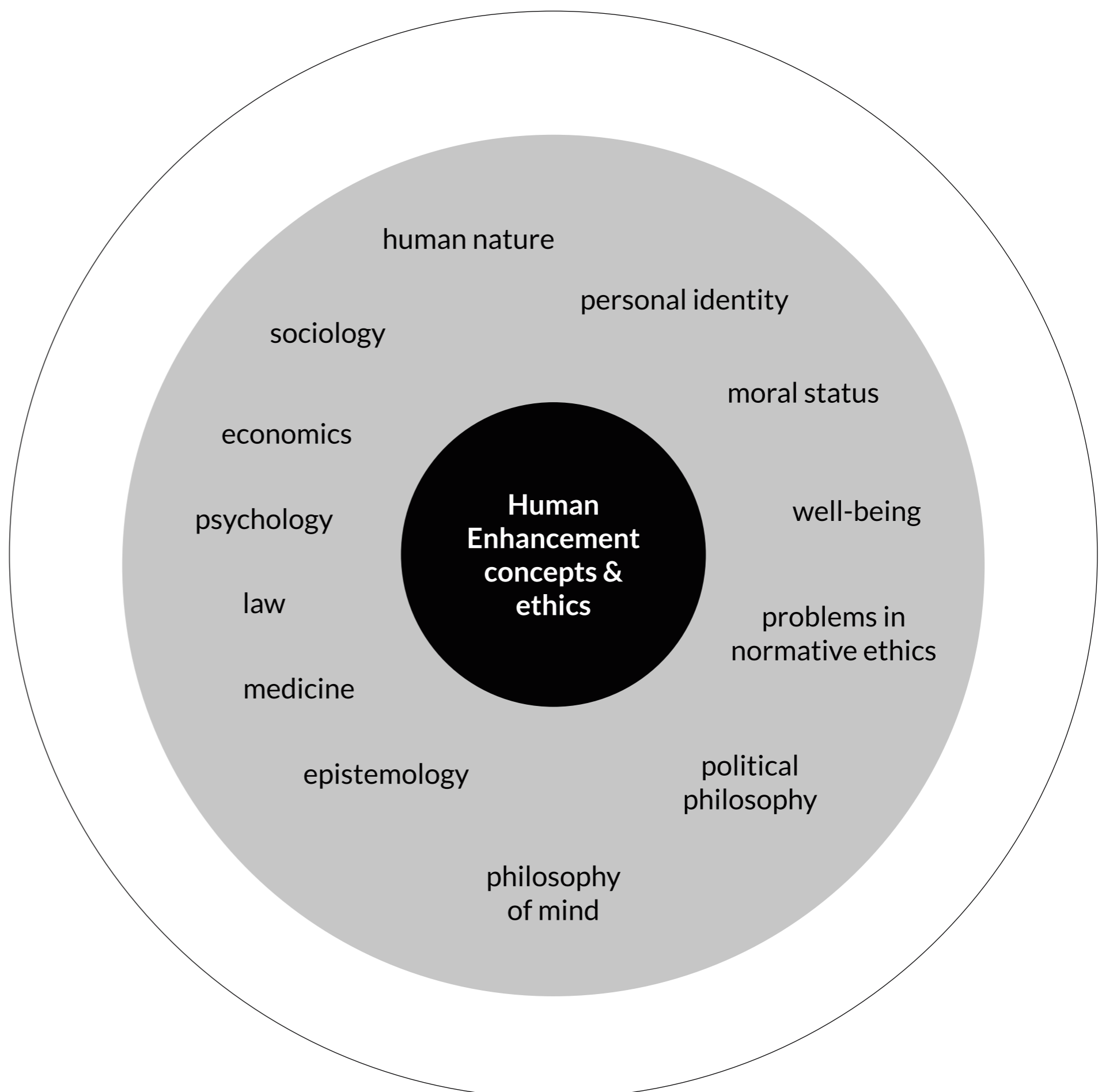

Fig 2. Human Enhancement, concepts and ethics. Source: Bostrom, Savulescu 1-18.

HUMAN AUGMENTATION

ASSISTIVE TECHNOLOGIES

Even if might sound futuristic, is actually part of human life since the very early beginning of humanity itself. There are many forms of human augmentation in current times that can enhance the human body and mind. Although as in everything the limit must be applied to not overdo it. There are no actual established policies for this reason and most likely it depends on the customer especially if it is done privately.

The purpose of human augmentation is to improve health or repair, heal, and fix to provide a better quality of life, performance, skills, productivity and entertainment. It can be for a need or desire, temporary or permanent, extrenal or internal or mix of those.

Human Augmentation covers all internal organs, and external parts of the human body including but not limited to prosthetics, smart bionic limbs, pacemakers, brain chip implants, as well esthetics, medical surgical procedures of e.g. breast implants, and genetic modifications.

Human augmentation as well includes wearable devices, digital and analogue e.g. watches, smartwatches and eyeglasses, Virtual Reality headsets, and Augmented Reality glasses.

Augmentation as a word means actually the action or the process of making or becoming greater in the size (larger or smaller) or in amount, quality or quantity or a skill. Augmentation comes from the late Latin augmentare, augmentario, which was established in late middle English as augment and augmentation popularise especially before XVIII slowly decreasing and became again popular in the recent decade Coenen, Smits, Klaasse, Hennen, Rader, Wolbring 6-20.

For the health purpose the augmentation technologies are called assistive technologies, and include e.g. hearing aids, wheelchairs, walking sticks, communication aids, prostheses, pill organizers and memory aids and for vision spectacles, many other Braille itself, white canes, large prints, text speech reading devices, colour-blind glasses, and even guide dogs etc.

The "human enhancement" refers to a wide range of existing, emerging and visionary technologies:

pharmaceutical products	neuro implants
drugs that boost brain power	human germline engineering
reproductive technologies	nutritional supplements
brain stimulation technologies	alleviate suffering
control mood	gene doping in sports
cosmetic surgery	anti-ageing medication
growth hormones for children of short stature	prosthetic applications that may provide specialised sensory input or mechanical output

Fig 3. The human enhancement refers to a wide range of existing, emerging and visionary technologies as listed in the table. Source: Coenen, Smits, Klaasse, Hennen, Rader, Wolbring 6-20.

HA refers to existing, emerging and speculative technologies and actions within a variety of fields of human life.

1. Restorative or Preventive, Non-Enhancing Interventions	2. Therapeutic Enhancements	3. Non-Therapeutic Enhancements

Fig 4. The authors of "Human Enhancement" distinguish several categories as above. Source: Coenen, Smits, Klaasse, Hennen, Rader, and Wolbring 6-20.

DIGITAL DEVICES

VIRTUAL REALITY

AUGMENTED REALITY

Digital devices are external physical equipment, within a display screen including touch screens kept at a distance from the eyes depending on the size of the device and as well purpose. The digital device's purpose is to display data to inform others, provide entertainment, perform tasks, behave on request and with the ability to edit the digital data depending on the needs and goals of the user.

Digital devices include mobile phones, smartphones, desktop computers, laptops, tablets, e-readers and many devices such as smartwatches, DTV, and digital TV versus analogue TV.

They are commonly used nowadays for personal and professional purposes, quite inexpensive depending on the quality, brands and models constantly improving the speed, performance display resolutions and many other features such as battery life.

Virtual Reality (VR) is a virtual world, which is an unreal world or virtual world based on reality, more or less abstractive, often artistic, creative, and cartoonish. It is estimated experiences in real-time for the user, which employs the actual movements of the user by tracking it and implementing it in the virtual reality world to enhance and embrace the experiences while giving the ability to perform the tasks and enjoy them while being connected within the body and mind to immersive the feeling or the virtual world.

The virtual reality application is created for entrainment, education and business purpose. It is the closest 3D near-eye display screen placed in the headset, which is a head-mounted computer device and advanced joysticks to perform an action by directing a virtual pointer and pressing buttons. The VR wearers are video gamers, users of communication meeting rooms, various digital applications and as well, and simulator trainers in various industries as e.g. pilots (Greengard 1-30).

Augmented Reality (AR) is a combination of the real world with computer-generated content. Real-time experience merges with digital data, overlapping while becoming interactive through unification.

AR displays additional information, text, data and graphics on devices such as smart glasses or wearable computers. The main focus is on training, productivity, sports and entertainment (Greengard 1-30).
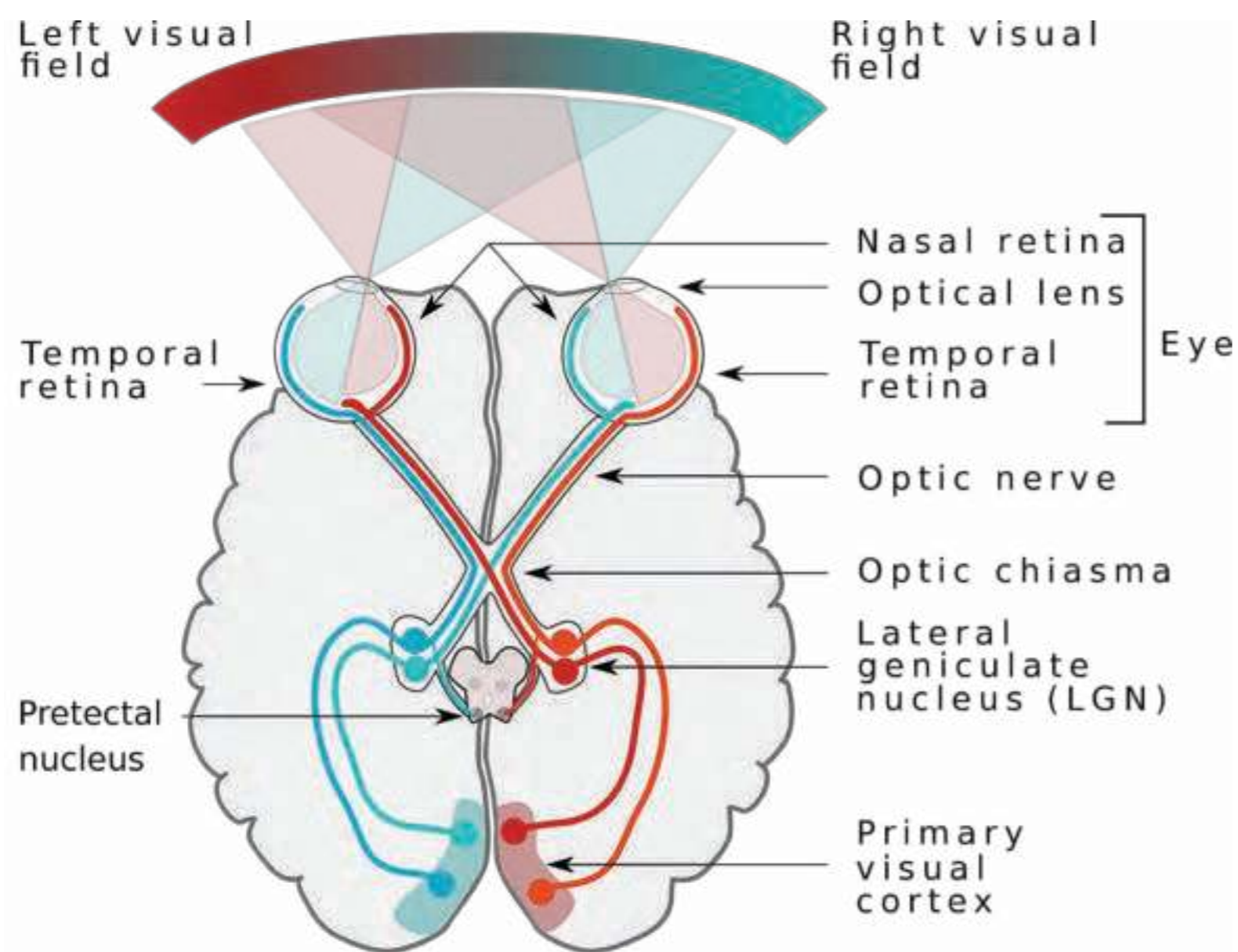
Fig 5. A simplified schema of the human visual pathway. Source: Wikipedia, User: Miquel Perelló Nieto
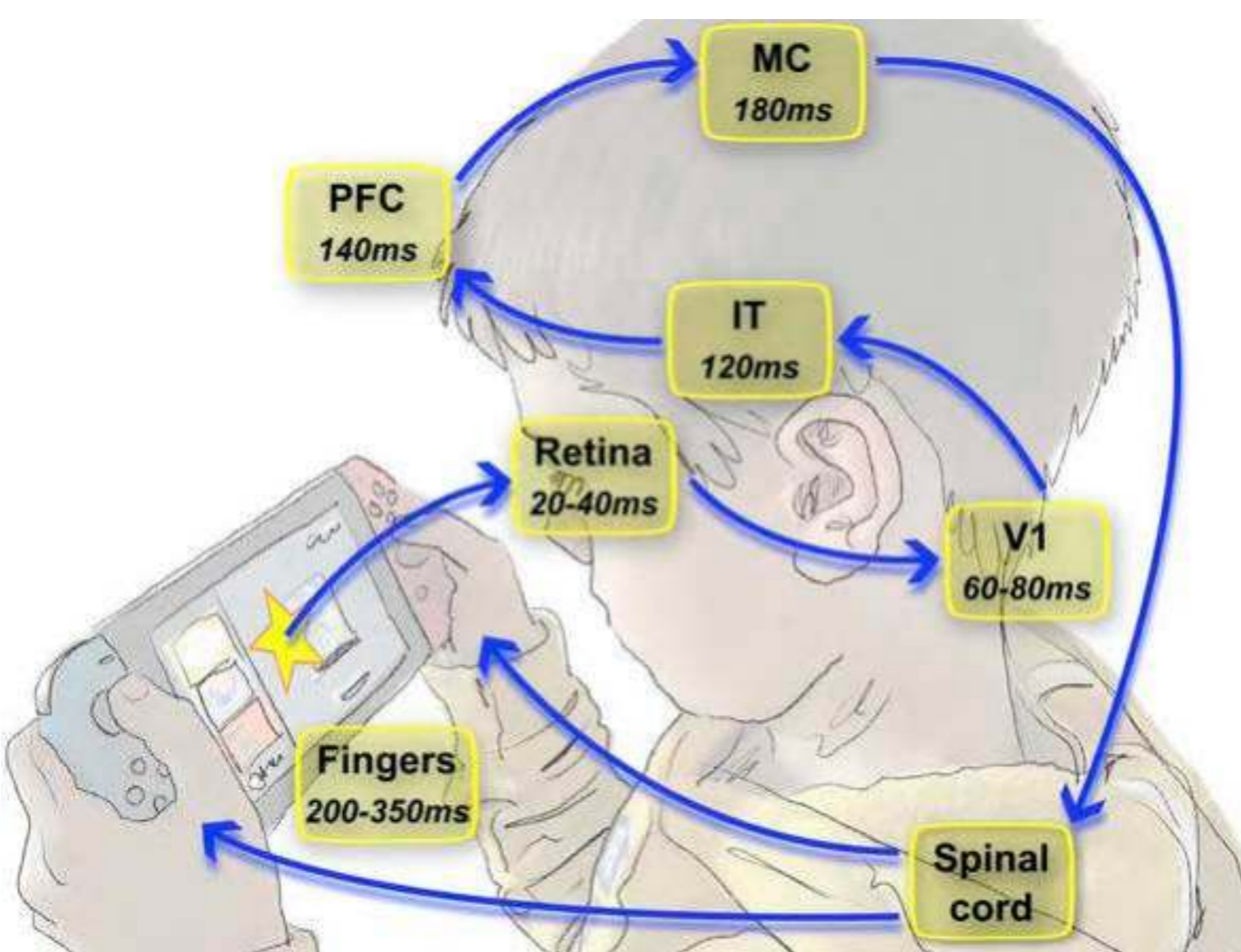

Fig 6. Latency of response to a visual stimulus along the visual pathways. Source: Wikipedia, User: Laurent Perrinet.

Latency of response to a visual stimulus along the visual pathways. Though the visual system is highly inter-con-nected, one can follow the sequence of activations whenever an image (here a yellow star) is flashed in front of the eyes. Different areas are schematically represented by ellipses and arrows denote the fastest feed-forward activation, ordered with respect to their activation latency. In order, the retina is first activated (20–40 ms) then the thalamus and the primary visual cortex (V1, 60–80 ms). Visual information used for object recognition follows the temporal lobe to reach the infero-temporal area (IT, 120–140 ms), and then follows non-visual pathways: the prefrontal cortex (PFC) which modulates decision making and the Motor cortex (MC, 140–190 ms). This mediates a motor action which is then relayed through the spinal cord to trigger finger muscles, with latencies about 200–350 ms.

HOW THE BRAIN SEES?
FAILURE OF AR
SHIFT TO MIX REALITY

The anatomy of eyes, lenses and receptors have a focal point and naturally adapt the depth of perception with its close or far distance, not both at the same time. Using AR glasses can cause safety concerns due to decreased balance in simple actions such as walking and running. The AR glasses are advertised for fitness activities as a way of improving physical goals, however constantly adjusting the eye to the front display details disturbs the cerebellum, responsible for the brain's balance functions.

The brain constantly is connecting the functions of receptors such as eyes, inner ears, muscles and joints, and entire nervous systems and the environment in which a human is present regardless if it is stationary or in motion. VR and AR send conflicting information in rapid time, to which our brain is unable to adapt easily. This causes a lot of health issues including nausea, and motion sickness as the brain is simply confused about what is real and what is not.

The main problem with AR glasses is its impact on how our eyesight functions.

Early models of AR glasses (e.g.: Google Glass Magic Leap) have not been successful and as a result, these types of product have not gained traction or indeed market share with consumers.

Early models of AR glasses have not been successful and as a result, these types of product have not gained traction or indeed market share with consumers. AR faced issues due to privacy concerns by using in public places, as well as the limited field of view (FoV), lack of extensive testing on the cooperation of the eye anatomy, brain and the displayed information in front.

Haptics Technologies

The simplified generated VR elements as 3D images, animations and movies are overlay with the AR digital information computer-generated world, and place together in the users visible real-world together as one layer, which can be modified depends on the user needs.

AR ✚ VR ═ Mixed Reality

Fig 7. Haptics Technologies. Mixed Reality. Source: Greengard 1-18.

IMPORTANCE OF EYESIGHT

The quality of daily life is dependent on the ability to see and society as a whole is organised mainly through visual communication. Human communication throughout history, from prehistorical cave painting and ancient symbols to the invention of printing and cinematography, and now the digital era of public computers and mobiles, is primarily image-based.

The human eye is a unique and complex organ that perceives the environment in which we live through sensory perception, the intensity of light and the ability to be receptive to it by the structural connection linking the anatomy, biochemistry and the electrical connection of neurons to the brain (Sharif 1-4).

This research due to ethics won't investigate the people's reflection on their knowledge about eyesight, their medical history or feelings about blindness or vision impairment but will focus on the vision augmentation technology and public awareness, attitudes and acceptance levels towards it.
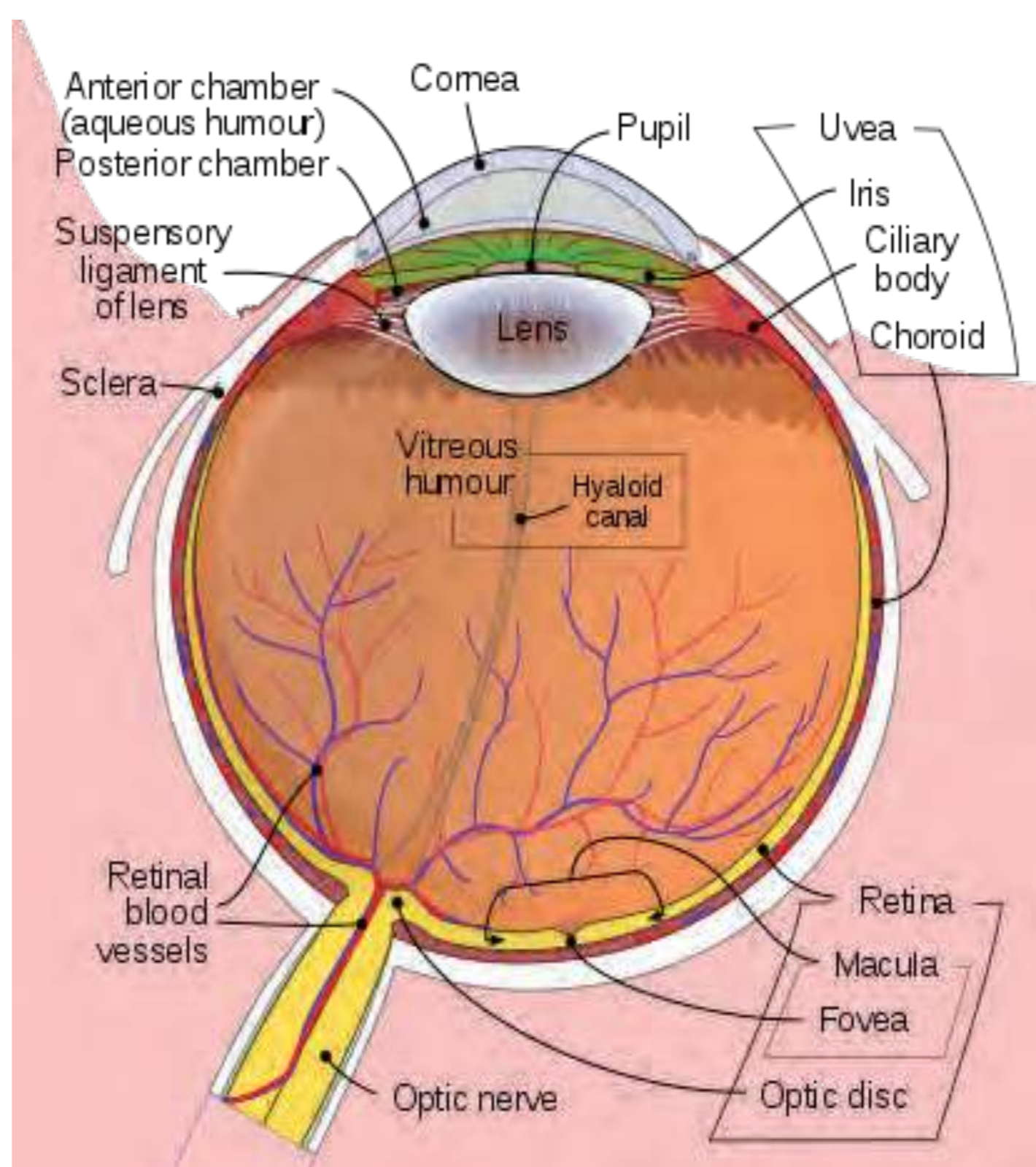

Fig 8. Schematic Diagram of the Human Eye.
Source: National Library of Medicine, Stat Pearls, Contributed by Wikipedia Users: Rhcastilhos, Jmarchn.

REASONS FOR LOW VISION
AND LOSS OF EYESIGHT

The health of the eye is impacted by a number of external factors such as the environment, quality of life, quality of diet and water, exposition to digital technology as screens, and biological factors such as genetics within the anatomy of the eye itself, the connection of neurons within brain cells, often referred and grouped as the eye-brain disorders (Sharif 1-4).

The eye is delicate and sensitive to any short or long-term exposition to unwanted objects inside the eye socket or eyeball, or any pressure on the eye itself, or the brain. Physically damaging accidents can easily damage the structure of the eye and connection within the visual neurons which may cause temporary or permanent dysfunction including partial or full vision loss if it happens to both eyes at the same time.

The impact of various uncontrolled and controlled factors on the complex anatomy of the eye, the brain structure and biochemistry, can cause vision impairment or blindness and drastically change the lives of individuals.

The leading causes of vision impairment and blindness

Uncorrected refractive errors
e.g. poverty, isolation, lack of awareness, poor availability and access to eye health facilities.

Cataracts
The lens develops cloudy patches. Over time these patches usually become bigger causing blurry, misty vision and eventually blindness.
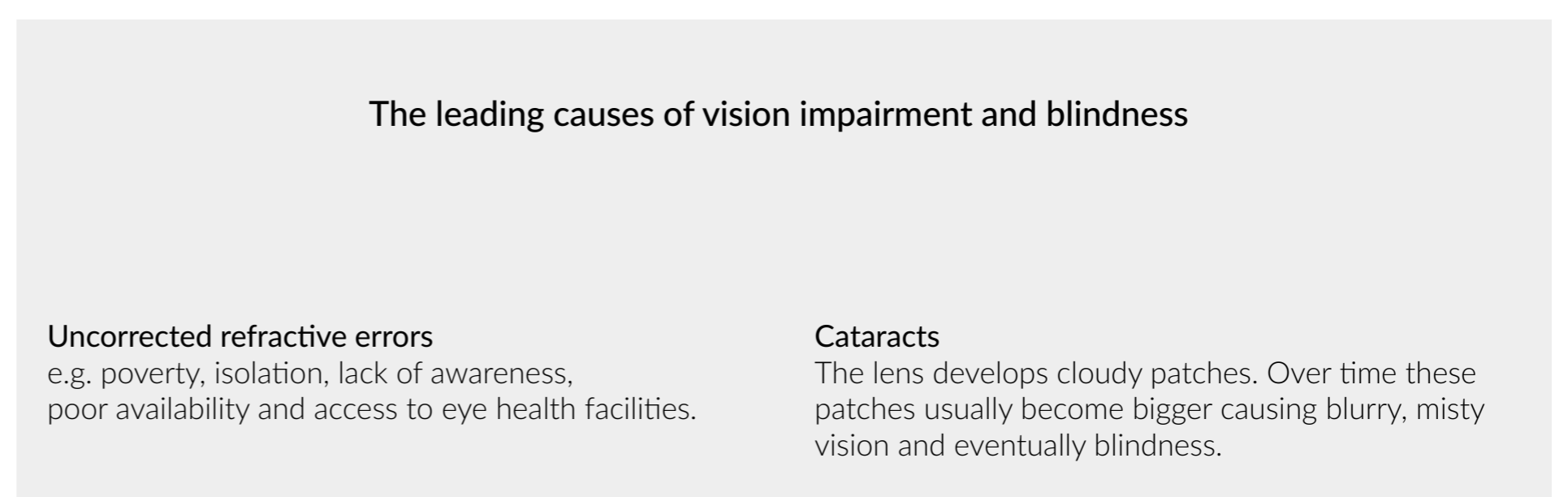
Fig 9. The leading causes of vision impairment and blindness. Source: WHO and NHS.

KEY FACTORS STATISTICAL
AND FACTUAL INFORMATION

Amongst the 8 billion people in the world, almost a quarter are visually impaired. It is not a marginal issue. In the academic journal, authors debated, the number of visually impaired people rapidly growing and will be doubled in 2030 (Al Shehri, Almalki, Alshahrani, Alammari, Khan Alangari 1-5).

WHO Global Statistics

At least 2.2 billion people are impacted by a near (myopia) or distance (foresight) and half could be prevented.

Visually Impaired
21.6%

Global Population
78.4%

Fig 10. The global number of visually impaired. WHO Global Statistics. Source: WHO.

MAIN FACTOR AGEING

The most common partly loss of eyesight is not genetics or accidents, but gradual damage through ageing and related illnesses.

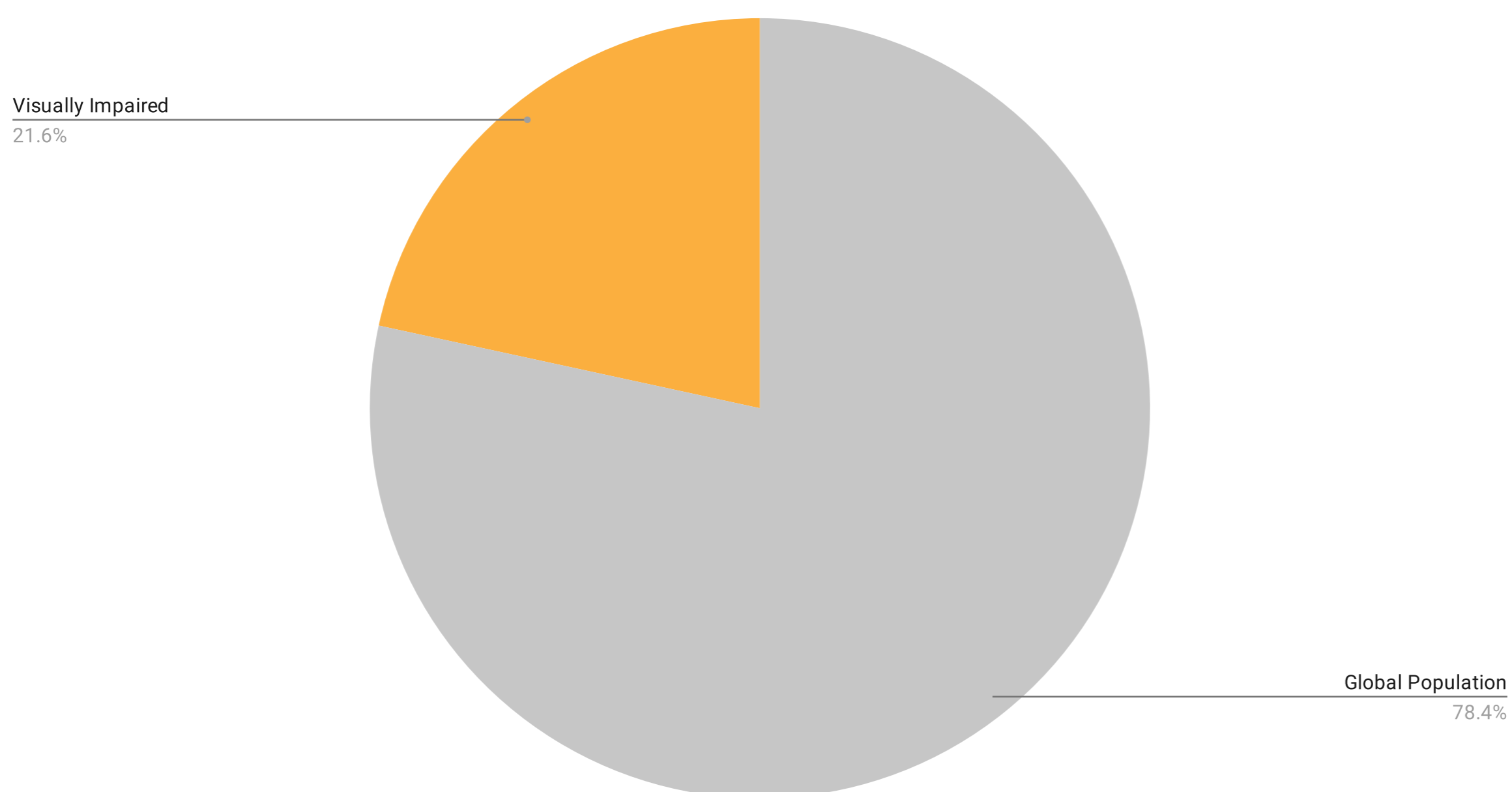An online article by the World Health Organisation published in 2022, blindness and vision impairment, states the majority of people who visually impaired are over 50 years (WHO). The leading cause of sight loss in Ireland for people over 50 is Age-Related Muscular Degeneration (AMD), (NCBI).

More people living longer means the number of people with age-related eyesight difficulties is growing. More awareness is needed especially among the preceding group of mature people (35-50) in order to prevent it and to take action before it happens.

Republic of Ireland National Statistics

Irish National Board for the Blind shared the 2016 Census results: 55,000 people are blind or visually impaired, but 2,250 is completely blind.
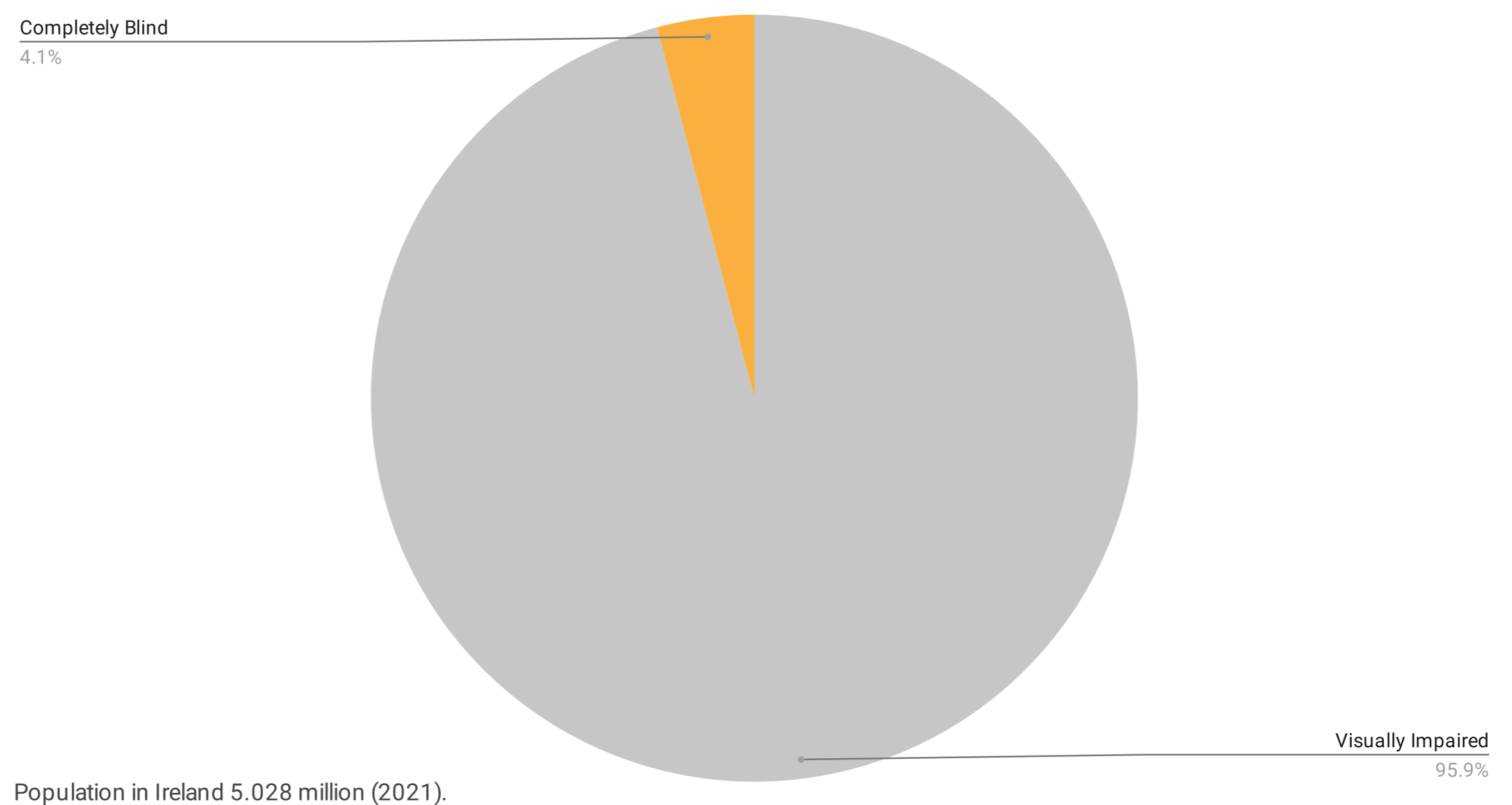
Completely Blind
4.1%

Visually Impaired
95.9%

Population in Ireland 5.028 million (2021).

Fig 11. The Republic of Ireland number of completely blind and visually impaired. NCBI National Statistics. Source: NCBI.

TYPES OF VISUAL IMPAIRMENT

In a recent study assessing the levels of colour blindness in university students in Jordan (citation) it is worth noting that students were not aware of their vision impairment prior to being tested.

This prompts the question as to whether the general public is aware of colour blindness and if they have ever had the opportunity to be tested.

Visual impairment is on the list of disabilities and includes:					
various:	blurriness	blind spots	tunnel vision	floaters	colour blindness
complete or large loss of vision:	glaucoma	cataracts	macular degeneration	retinopathy	blindness

Fig 12. Visual impairment is on the list of disabilities. Source: National Eye Institute (NEI), by The National Advisory Eye Council (NAEC).

Colour Blindness called Colour Vision Deficiency (CVD) Types:		
Red-Green	**Blue-Yellow**	**Complete - Monochromacy**
the most common	less common	rare
Deuteranomaly	**Tritanomaly**	**Inability to see any colours**
green looks redder	challenge between blue and green, and between yellow and red	only see a greyscale, black and white large sensitivity to light
Protanomaly	**Tritiopania**	
red looks greener and less bright	inability to see the difference between blue and green, purple and red, yellow and pink. Colours are less bright	
Protanopia and Deuteranopia		
inability to differentiate between red and green at all		

Fig 13. The type and characteristics of Colour blindness are called Colour Vision Deficiency (CVD).
Source: Al-Aqtum, Al-Qaqasmeh, Mohammed. Page 38-42.

Estimated number of colour blind people worldwide

300 million equal entire the USA population (331.9 millions in 2021)

Fig 14. Estimated number of colour-blind people worldwide. Source: Colour Blindness Awareness.

Colour Blindness Statistics in the United Kingdom

1 in 12 men
1 in 200 women

Fig 15. Estimated number of colour-blind people in the United Kingdom. Source: Colour Blindness Awareness.

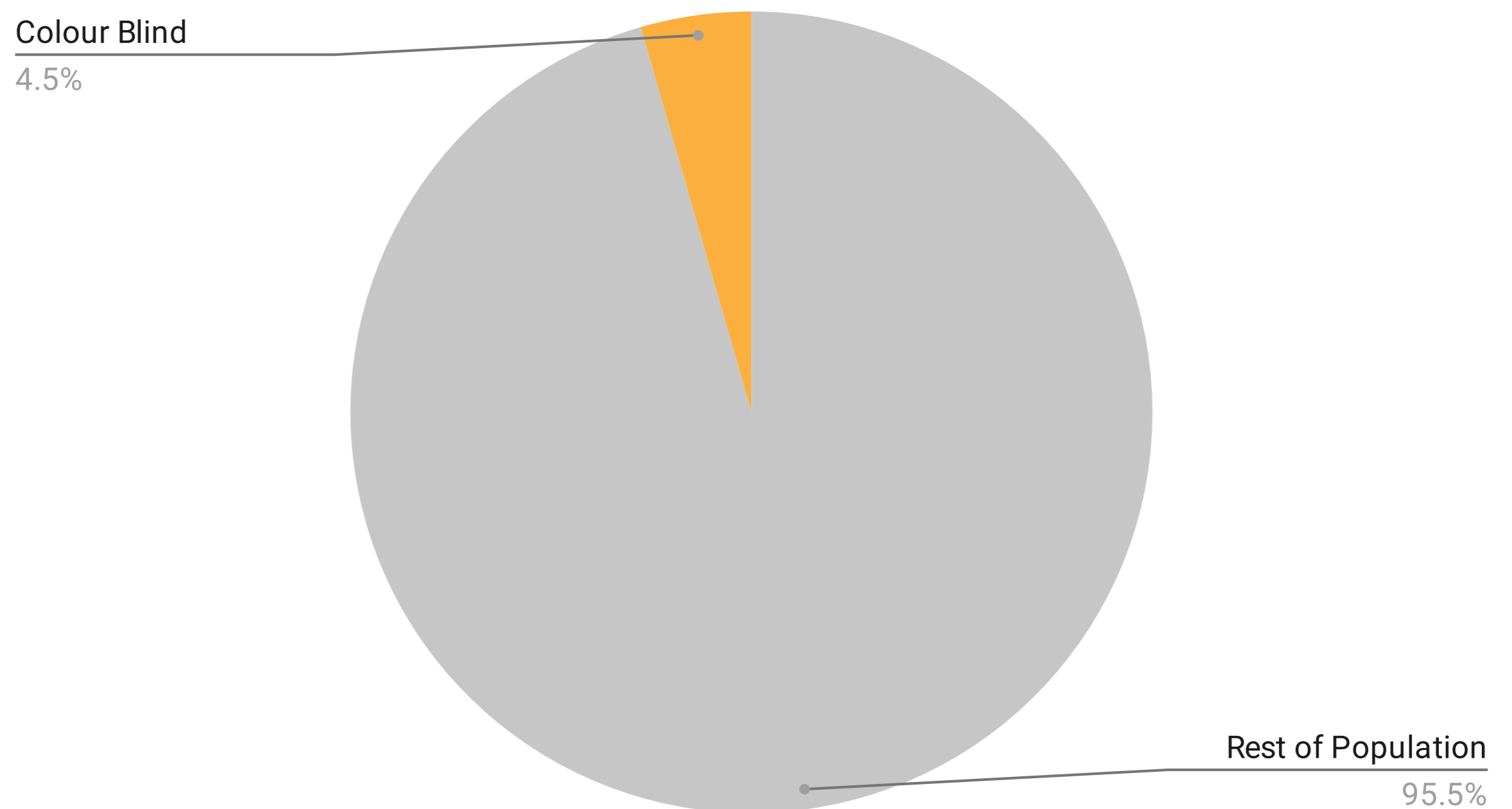4.5% of the United Kingdom population is Colour Blind, mostly male

Colour Blind
4.5%

Rest of Population
95.5%

Fig 16. Estimated number of colour-blind people in the United Kingdom versus the entire population. Source: Colour Blindness Awareness.

Colour Blindness statistics

Of 1418 students from one of Jordan's universities, 23 were tested positively.

Positive results
1.6%
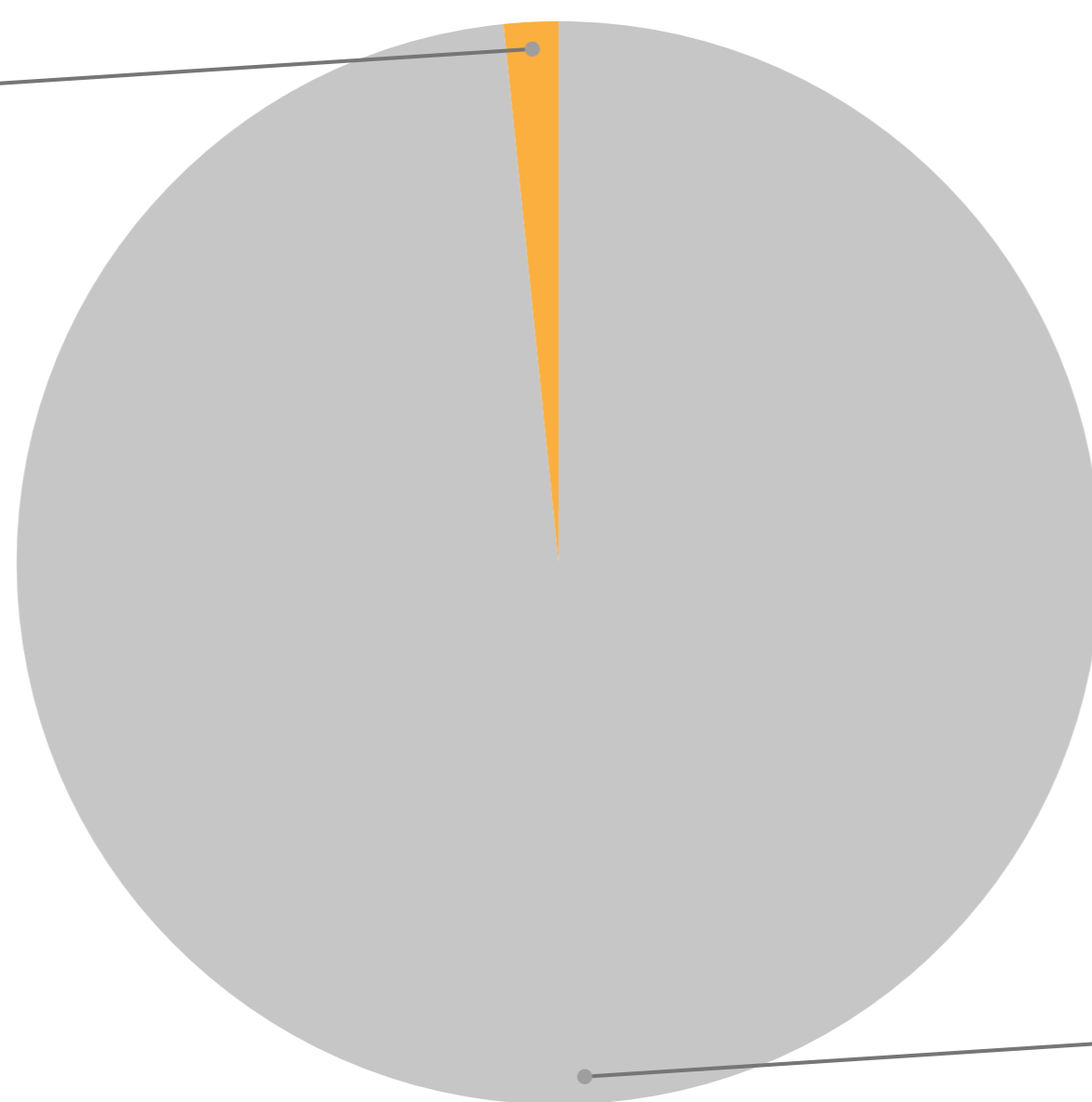
Negative results
98.4%

Fig 17. Estimated number of colour-blind people in one of Jordan's universities versus the tested number of students.
Source: Al-Aqtum, Al-Qaqasmeh, Mohammed. Page 38-42.

The leading colour-blindness standard glasses
Enchroma are priced at approx €250
(no other eyesight correction).

Fig 18. Estimated approximately the cost of one pair of colour-blind standard glasses without corrections.
Source: Salih, Elsherif, Ali, Vahdati, Yetisen, Butt 1-7 and Enchroma.

ASSISTIVE TECHNOLOGIES (AT) FOR EYESIGHT

For people with vision impairments, simple tasks such as moving, learning, and reading need to be supported by a range of aids and technologies. The increasing growth of people vision impairments both in Ireland (NCBI) and worldwide (WHO) indicates that these supports need to be widely accessible and available.

The main factor of vision impairment is age, which indicates that visually impaired people in their 50s are impacted the most (WHO, NCBI).

According to the Central Statistics Office, the population of people aged between 25-64 increased by 1.9% from the previous review in comparison to those over 65, which increased by 19.1% in Ireland. Naturally, the % of older generations will increase in 2030 (Census the latest data from 2016) and in line with CSO forecasts, they are predicted to live into their eighties.

This means the population of people with vision impairments in Ireland will increase. Similar worldwide, there are significant implications for the increasingly growing ageing population and their expected need for vision supports and assistive technologies.

These factors propose a range of future implications in terms of access to and cost of healthcare and vision-related supports (WHO).
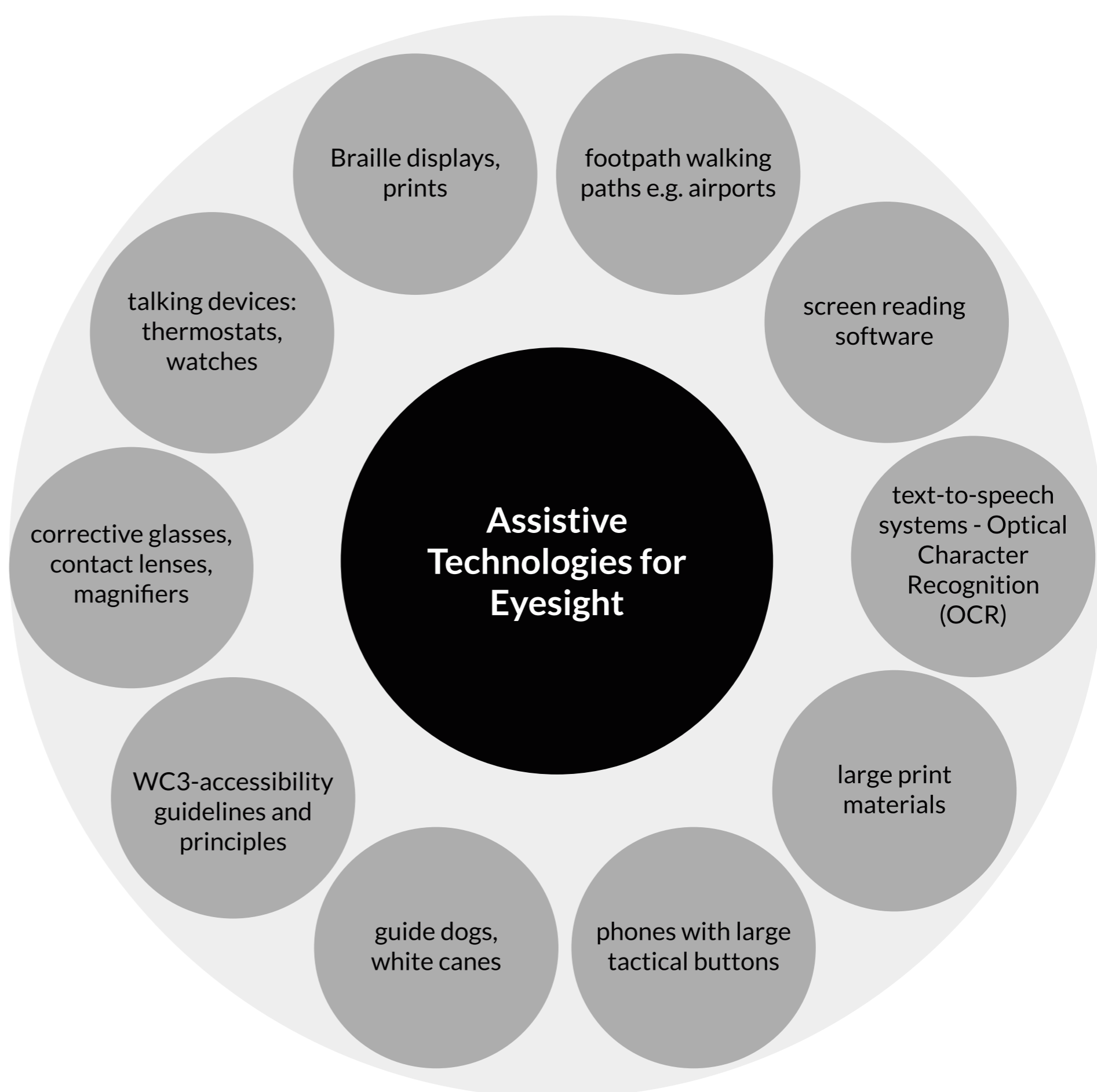

Fig. 19. Assistive Technologies for Eyesight (AT) include a variety of analogue and digital technologies. Source: Minnesota Government, NCBI.

EFFECTS OF ON-SCREEN TECHNOLOGIES ON VISION

The growing range and variety of digital screen displays available today has, is, and will continue to diametrically change our daily life, education, work and social interaction. In the context of this research digital screens include: computers, laptops, tablets, smartphones, heads-up displays (HUDs) and smart-glasses for VR and AR. They are becoming increasingly prevalent, more than 5 billion people now have mobile phones, and each year technological performance increases as costs decrease with widespread adoption.

The exposition to digital screens happens both in professional life, at work, school, college and during personal time. Digital screens have an enormous impact on people's life including health, especially eyesight which might cause Computer Vision Syndrome (CVS), which as per the diagram causes the listed ocular symptoms (Blehm, Vishnu, Khattak, Mitra, Yee 253-262).

The primary research will investigate what kind of awareness is about Computer Vision Syndrome and what kind of attitudes and acceptance levels are along the public.
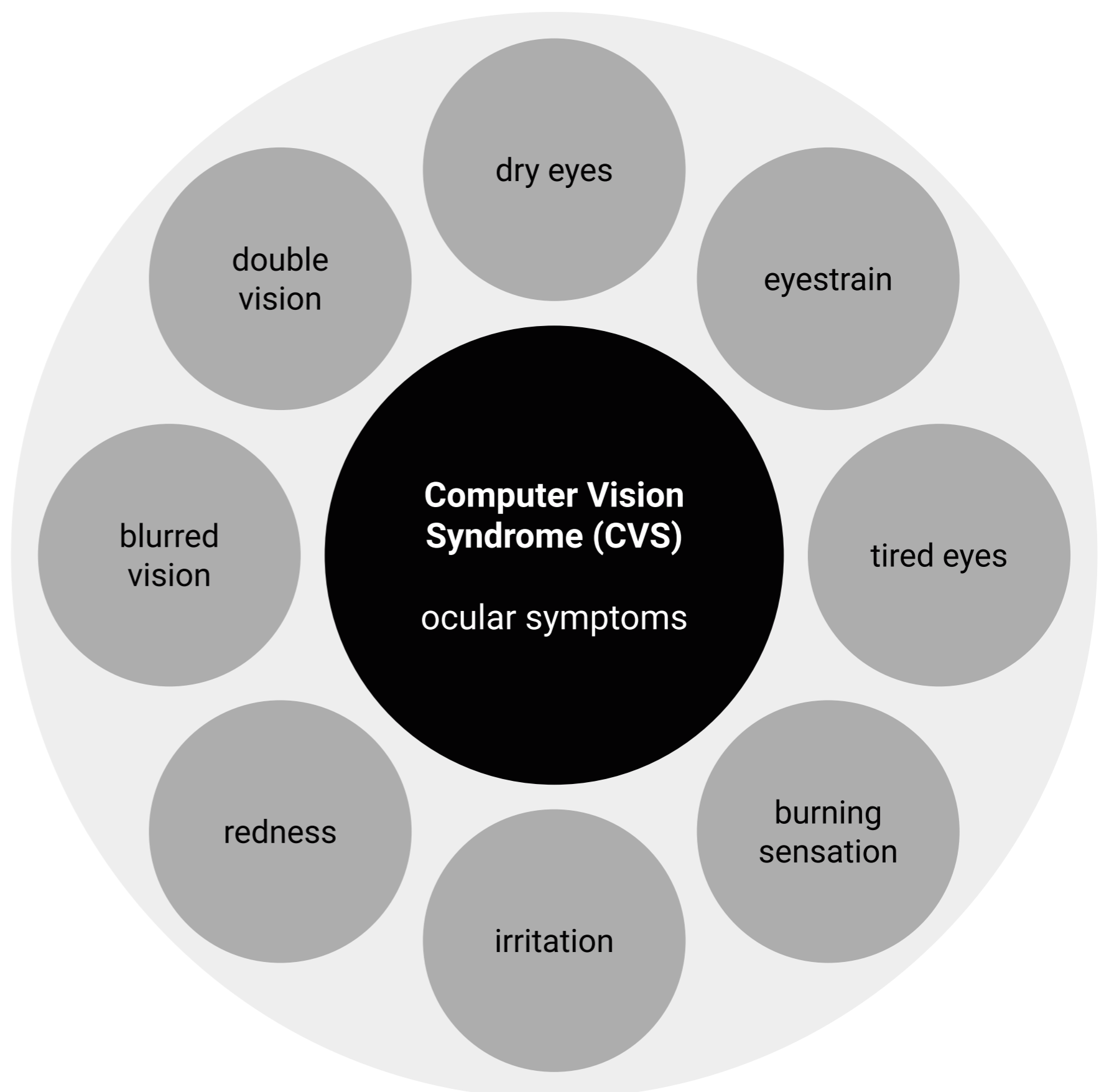
Fig 20. Computer Vision Syndrome (CVS). and ocular symptoms. Source: Blehm, Vishnu, Khattak, Mitra, Yee 253-262.

Computer / Screen Vision Syndrome	
causes	**preventions**
lighting	computer glasses
glare	lubricant eye drops
display quality	proper lighting
refresh rates	anti-glare filters
radiation	ergonomic position
	regular breaks

Fig 21. Computer-Screen Vision Syndrome.
Source: Blehm, Vishnu, Khattak, Mutra, Yee 253-262.

75% of jobs included computer usage in 2000 in USA

No Computer
25.0%
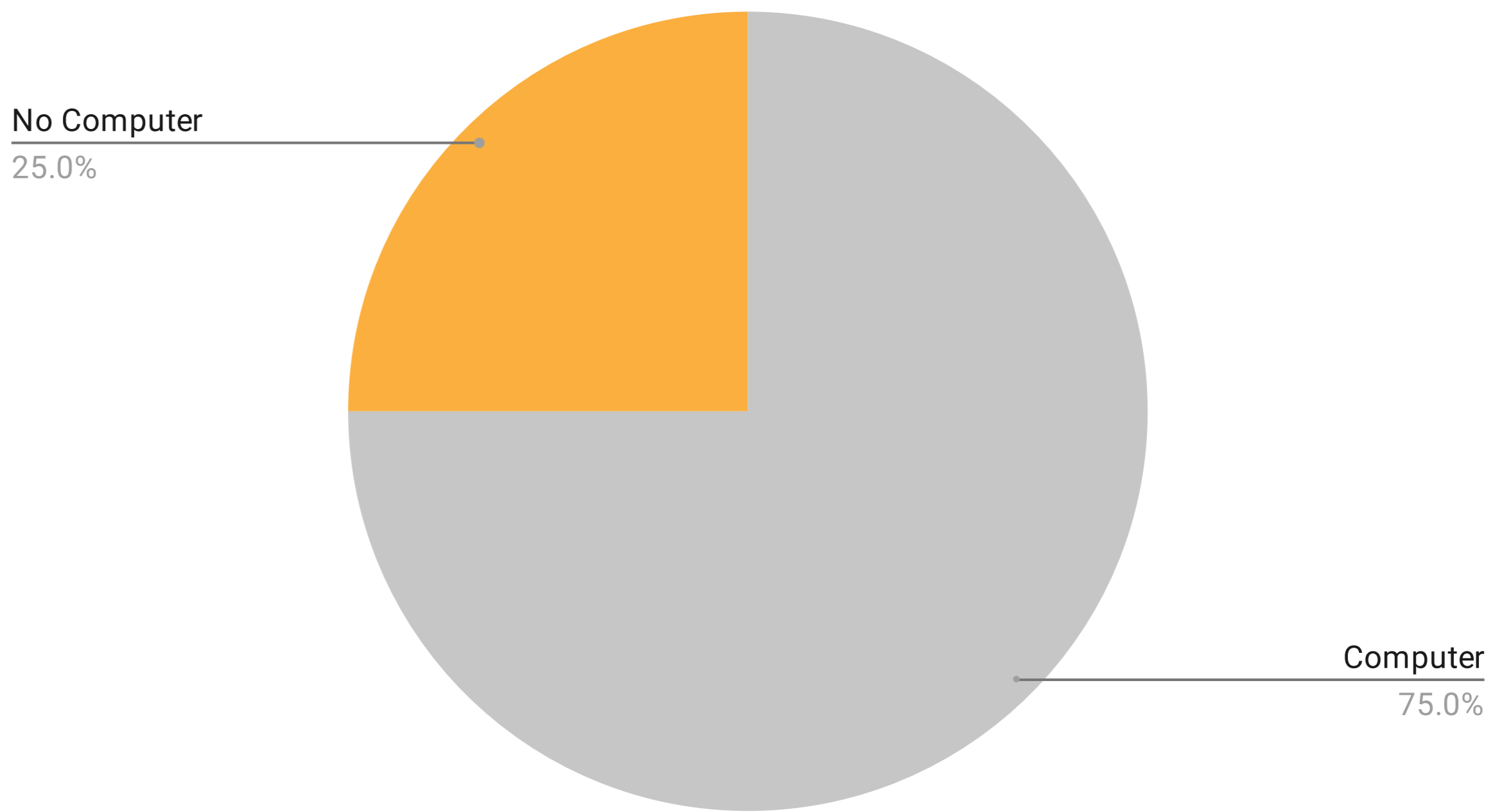
Computer
75.0%

Fig 22. The number of jobs including the computer in The United States of America. Source: Blehm, Vishnu, Khattak, Mitra, Yee 253-262.

Eyestrain complains by 70.6% workers in the conducted studies by National Institute of Occupational Safety and Health in Malaysia

■ None   ■ Neck stiffness, neck and shoulder pain, headache, backache, starting, gritty, blur vision, presbyopia, myopia, slowness of focus change

100

75

50

25

0

Total Number of Workers

Fig 23. The number of workers using computers in Malaysia complain of eye strain. Studies conducted by the National Institute of Occupational Safety and Health in Malaysia. Source: Loh, Reddy 128-130.

PREDICTED COSTS AND NUMBERS

ATs would need to be doubled within the upcoming years (Al Shehri, Almalki, Alshahrani, Alammari, Khan, Alangari 1-5).
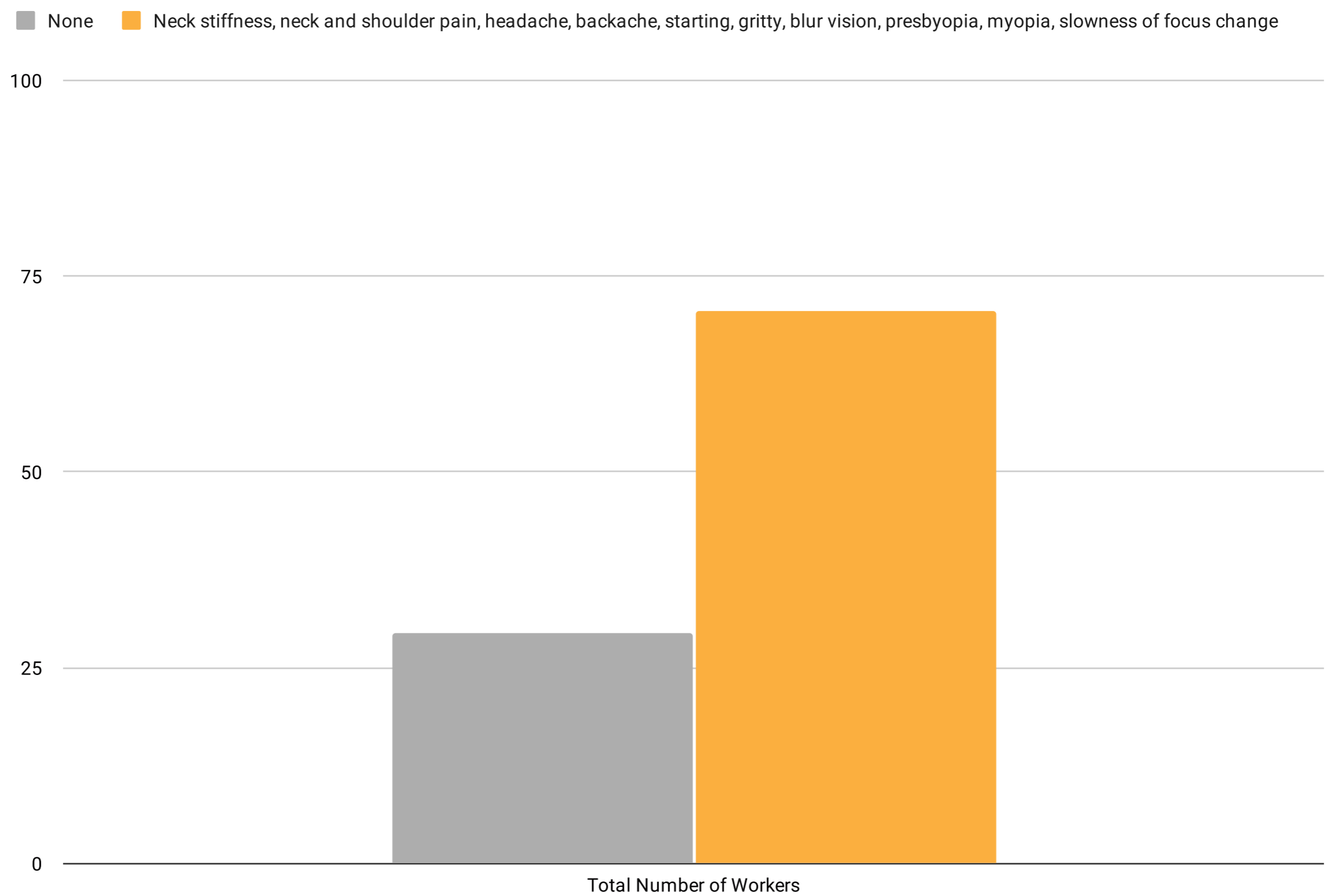
The list of people waiting for ophthalmic services is high in comparison to the overall population in the Republic of Ireland (as per the diagram below). The overall usage of digital screen devices is growing rapidly as well both for professional and personal usage.

This research will investigate if vision impairment is linked to vision augmentation technologies and what public awareness, attitudes and acceptance levels towards digital screen devices for professional usage at work, school, college and personally in comparison to awareness of vision assistive technologies for visually impaired people.

The list of waiting for outpatient ophthalmic services in Ireland

Total 52,436 people, 46,310 adults and 6,126 children.
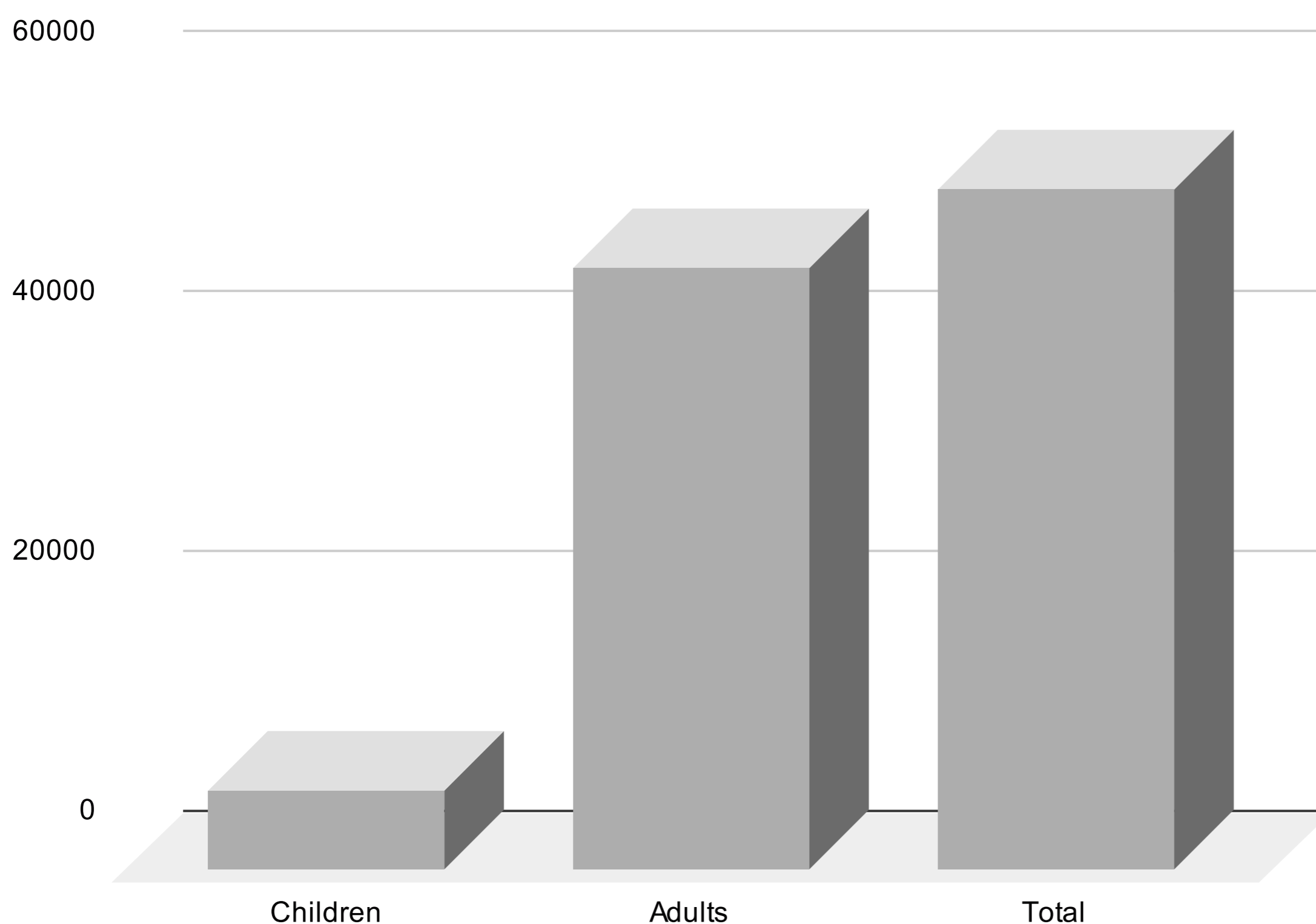
Fig 24. The list of waiting for outpatient ophthalmic services in Ireland. Source: NCBI based on the National Treatment Purchase Fund, NTPF.

**Estimated productivity losses associated
with vision impairment**
WHO, 13 October 2022

$411
billion

Fig 25. Estimated productivity losses associated with vision impairment.
Source: WHO.

**Computer Vision Syndrome diagnosis
and treatments costs in USA**

$ 2 billion
every year
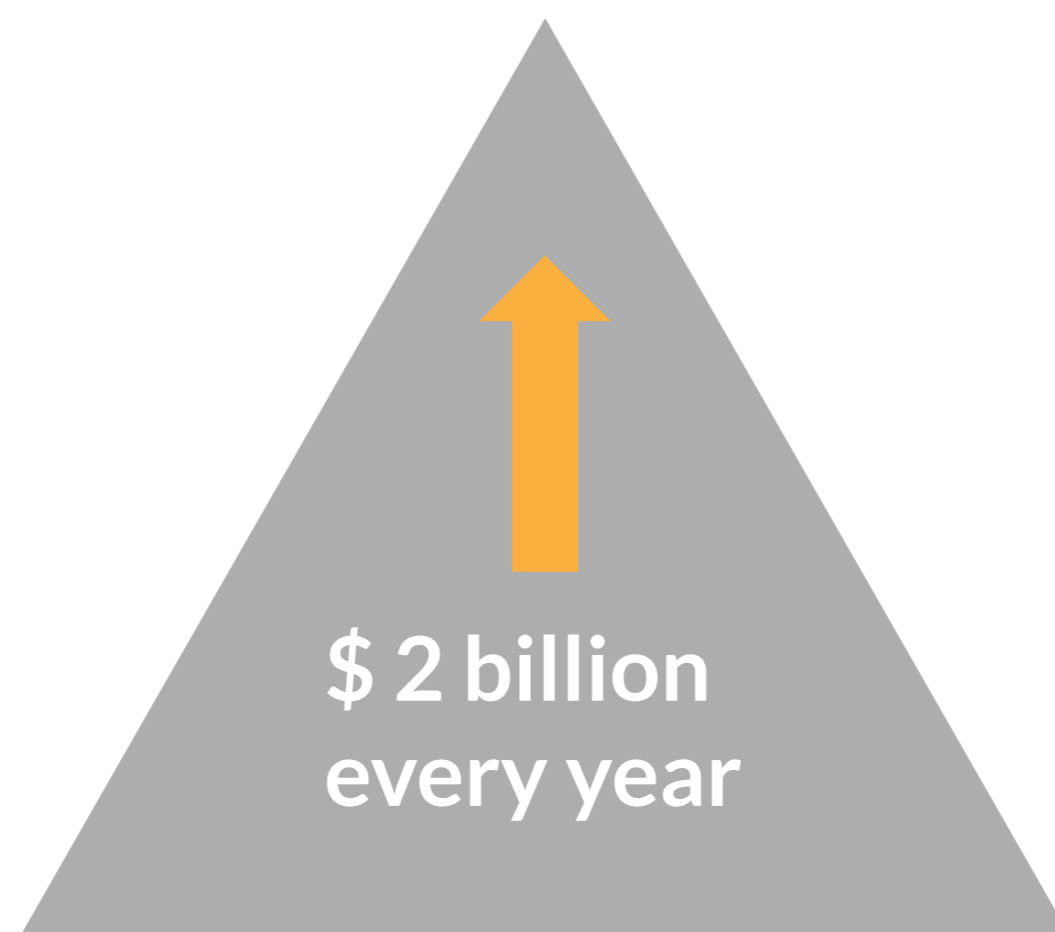
Fig 26. Computer Vision Syndrome diagnosis and treatment costs in the USA.
Source: Blehm, Vishnu, Khattak, Mitra, Yee 253-262.

SOLD AND ESTIMATED NUMBERS OF VR AND AR

The below diagrams based on the data from the book *Virtual Reality* by Greenard, it shows the sold numbers and estimated numbers of VR and AR headsets. The research on sales and prediction was conducted by Zion Market Research and ARtillary Intelligence.
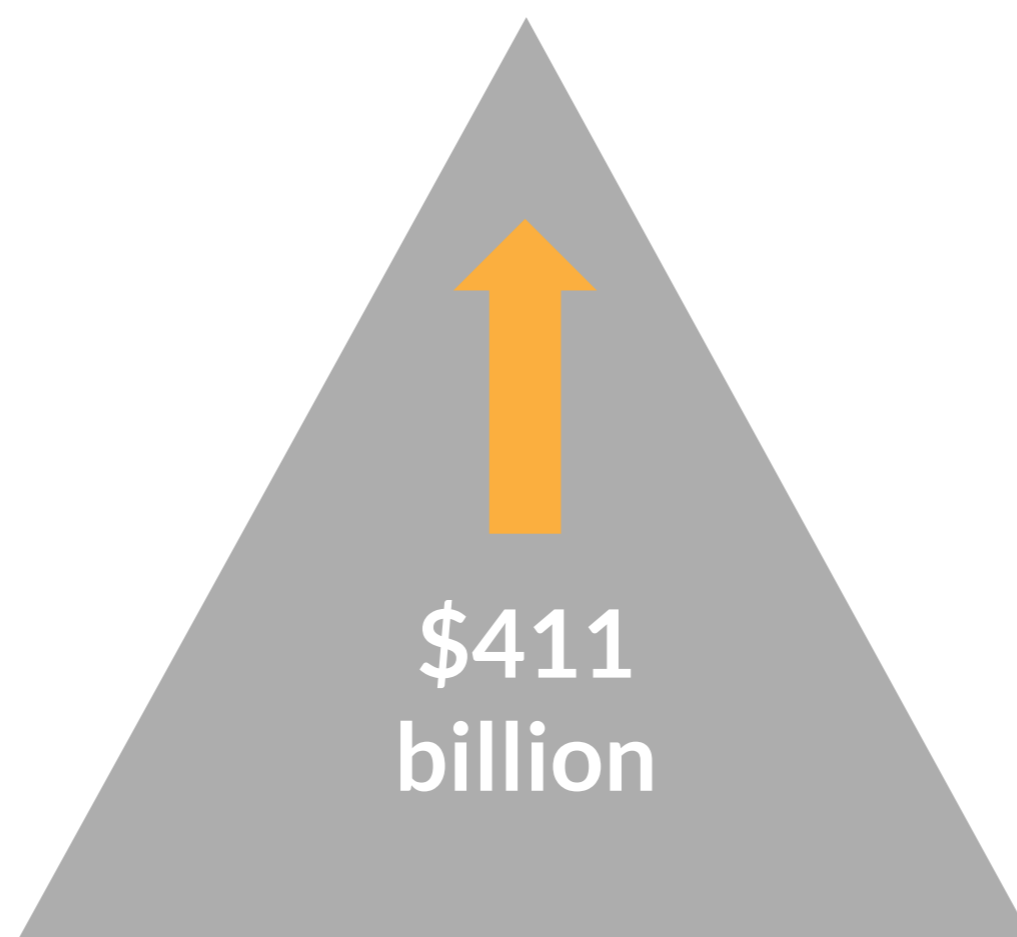
The upcoming primary research studies will conduct an unbiased investigation on the awareness of, attitude to, and acceptance level towards VR and AR. The aim is to observe the public feelings about those products, experiences and overall opinions.

VR Headsets Sales

Sony sold 3 million PlayStation VR headsets. All Companies including Meta's Occulus Quest, Hololens etc. sales reached 21.9 million.

Sony PlayStation
12.0%

Rest Companies
88.0%

Fig 27. VR Headsets have shared sales by companies. Source: Greengard 1-18.

VR and AR estimated sales for 2022. Growing rapidly to reach $61

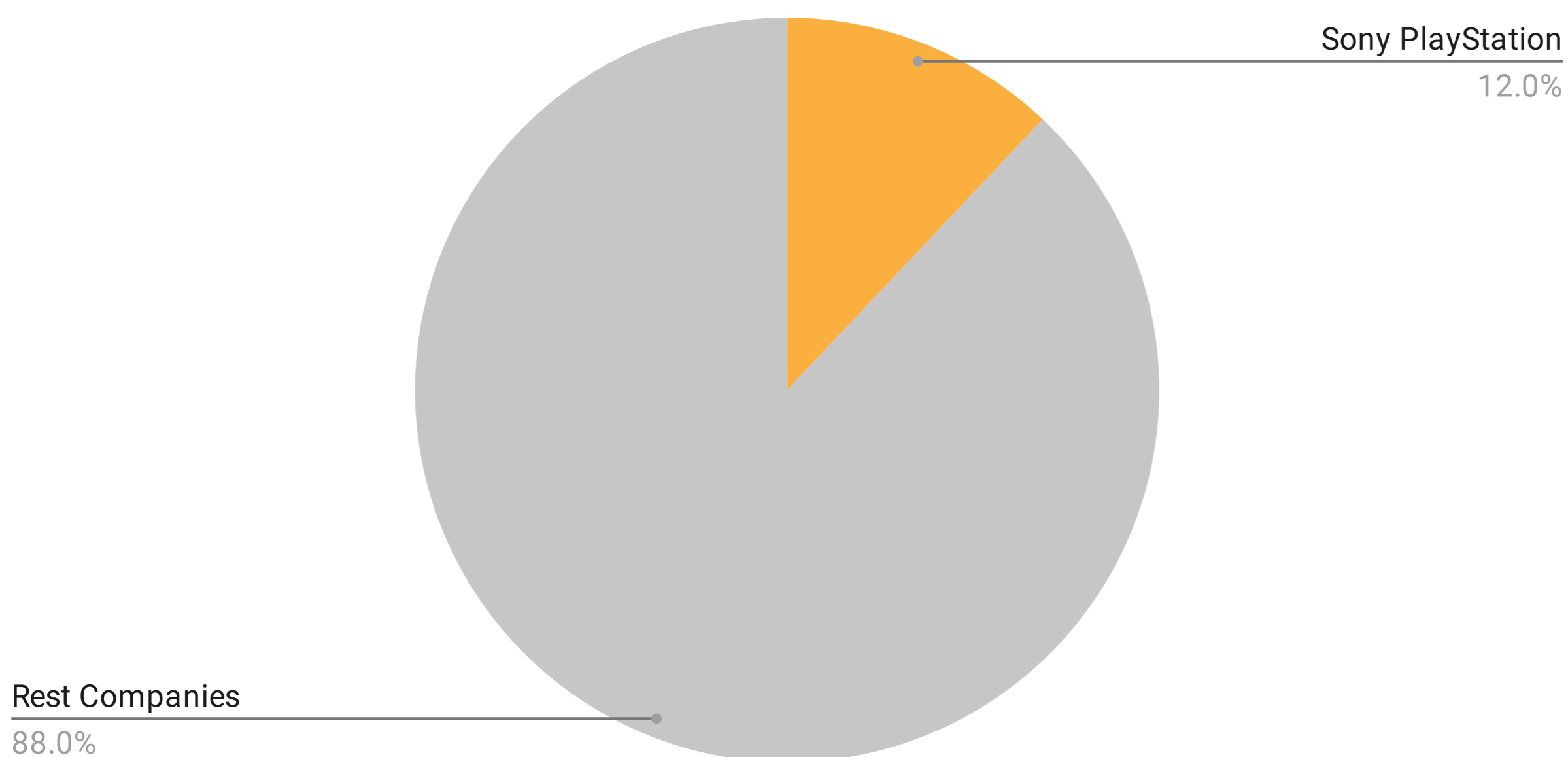Zion Market Research - $26.89 VR. ARtillary Intelligence - $18.8 AR.

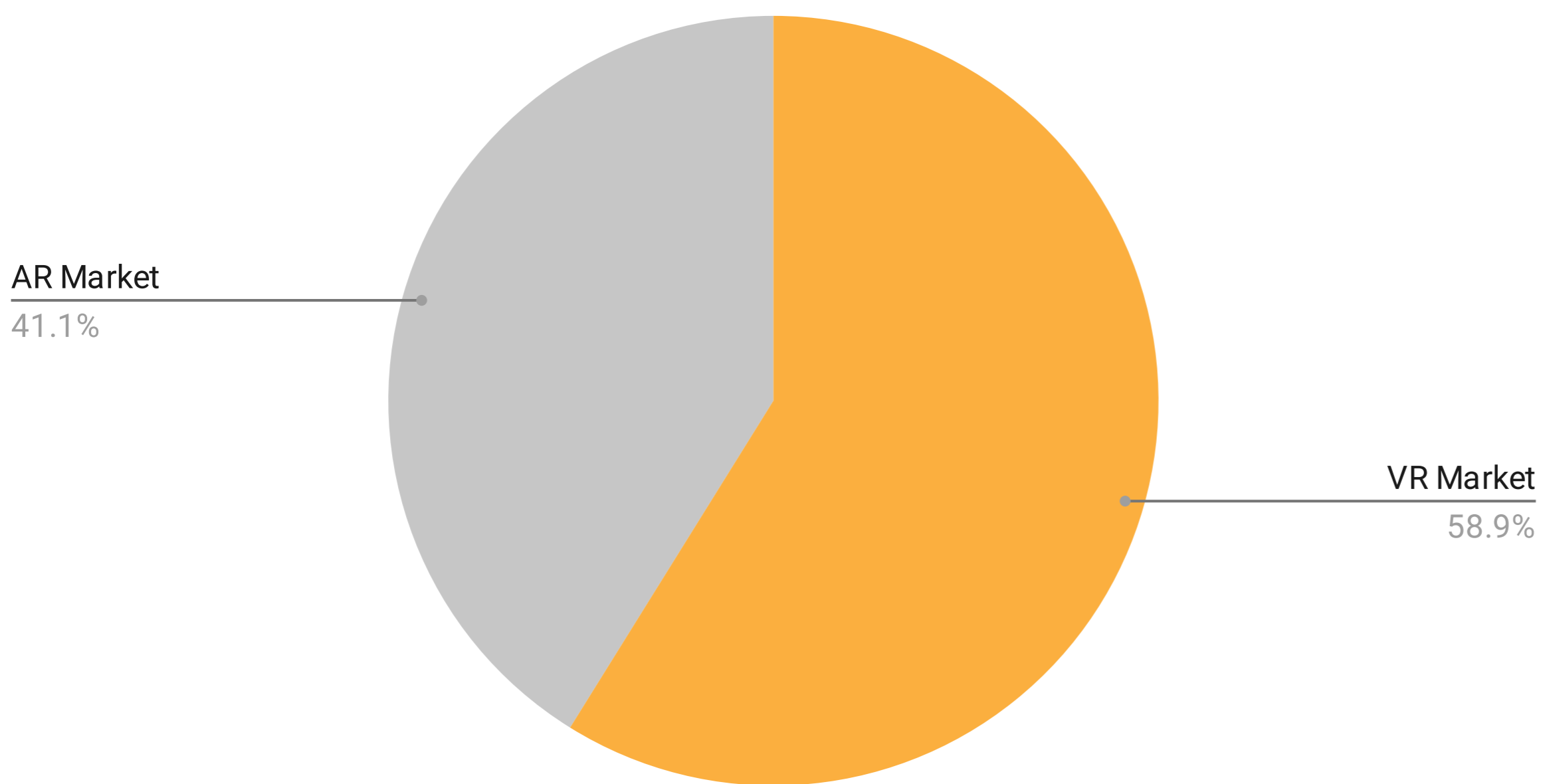AR Market
41.1%

VR Market
58.9%

Fig 28. VR and AR estimated sales for 2022. Source: Greengard 1-18.

WORLD WIDE WEB CONSORTIUM (W3C) & WEB ACCESSIBILITY INITIATIVE (WAI)

The User Experience was coined in 1993 by Don Norman at Apple Computer (NNG) to provide effortless experiences while using products and services, which gain popularity within digital devices. Soon after, 1994 W3C was established by Tim Berners-Lee.

WC3 is open to the public to check the validation of websites that can be verified by simply checking the URL address directly on the W3C website.

This research would observe the general public awareness of the WC3 as one of many Vision Assistive Technologies for visually impaired people. As far as peers' previous academic paper reviews, this was not part of the studies. This research project will contribute to new findings.

In the introduction from the Chief Executive Office of NCBI, Chris White in the Inclusion and Accessibility Labs, Digital Accessibility Index, 2022, a huge improvement was taken into action in he last 5 years in Ireland.

This research seeks public awareness of the World Wide Web Consortium (W3C) which provides resources and training and the ability to check if the website is designed to be accessible by visually impaired people. (W3C)

The aim in the primary research, will be to investigate what procentage, if any, of the general public is aware of the W3C.

World Wide Web Consortium (W3C) - Web Accessibility Initiative (WAI)	
When	Established in October, 1994. 10 years after the Internet was born on 1st January 1983.
Who	Founder, Inventor and Director Tim Berners-Lee . CEO Jeffrey Jaffe.
Where	The Massachusetts Institute of Technology, Laboratory for Computer Science (MIT/LCS) in collaboration with CERN (The European Organization for Nuclear Research), and with the support of The Defense Advanced Research Projects Agency (DARPA) and the European Commission.

Fig 29. World Wide Web Consortium establishment. Source: W3C.

The government websites with the International Web Content Accessibility Guidelines (WCAG) 1.1 AA standard

April 2022

not yet compatible
11.0%

compatible
89.0%

Fig. 30. The number of government websites with the International Web Content Accessibility Guidelines.
Inclusivity and Accessibility Labs Digital Accessibility Index 2022. Based on the Introduction from the Chief Executive Officer of NCBI. Source: White 3.

The private website with the International Web Content Accessibility Guidelines (WCAG) 1.1 AA standard

Into account taken 100 companies as per The Irish Times. April 2022

compatible
28.0%

non-compatible
72.0%

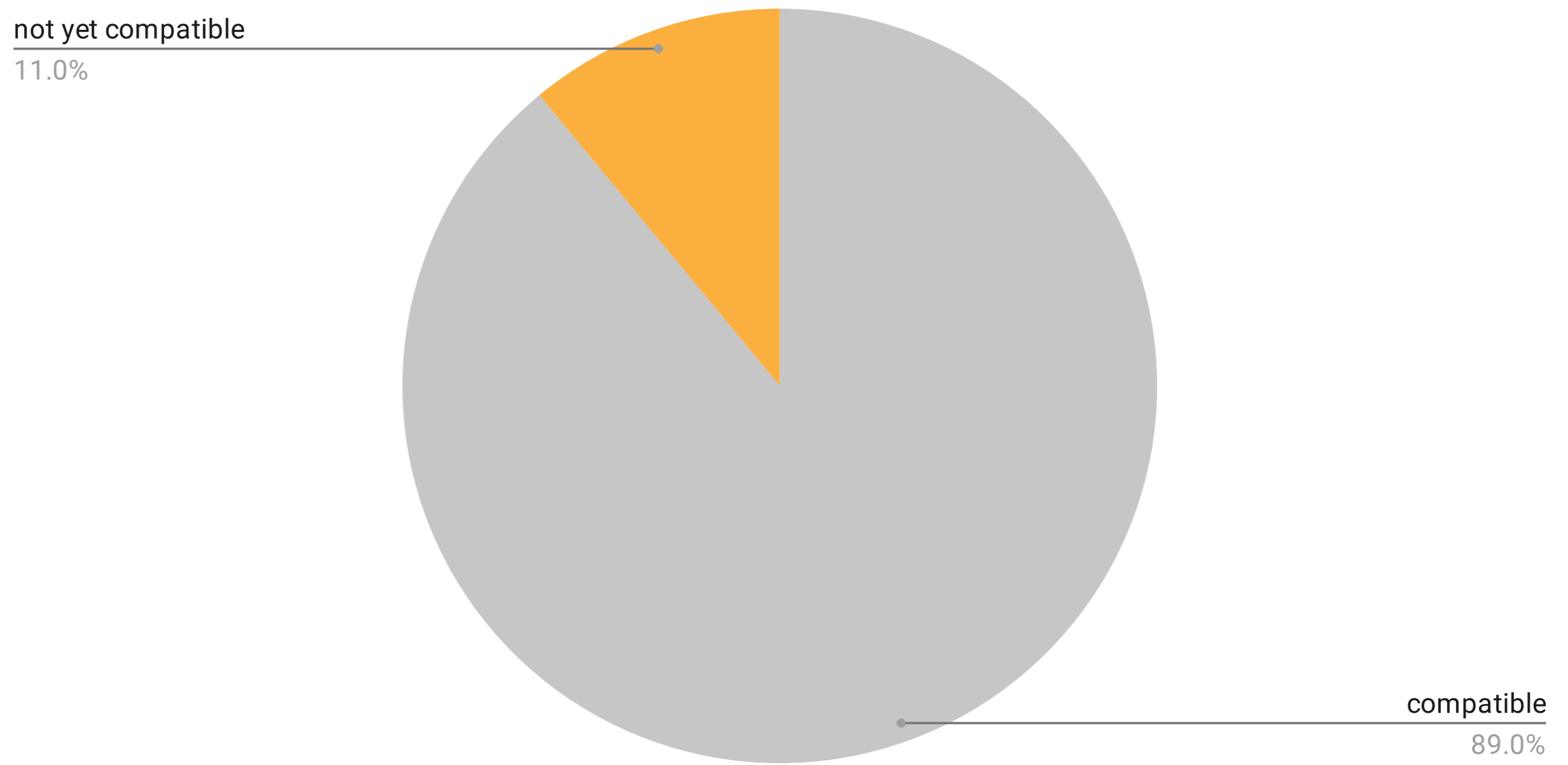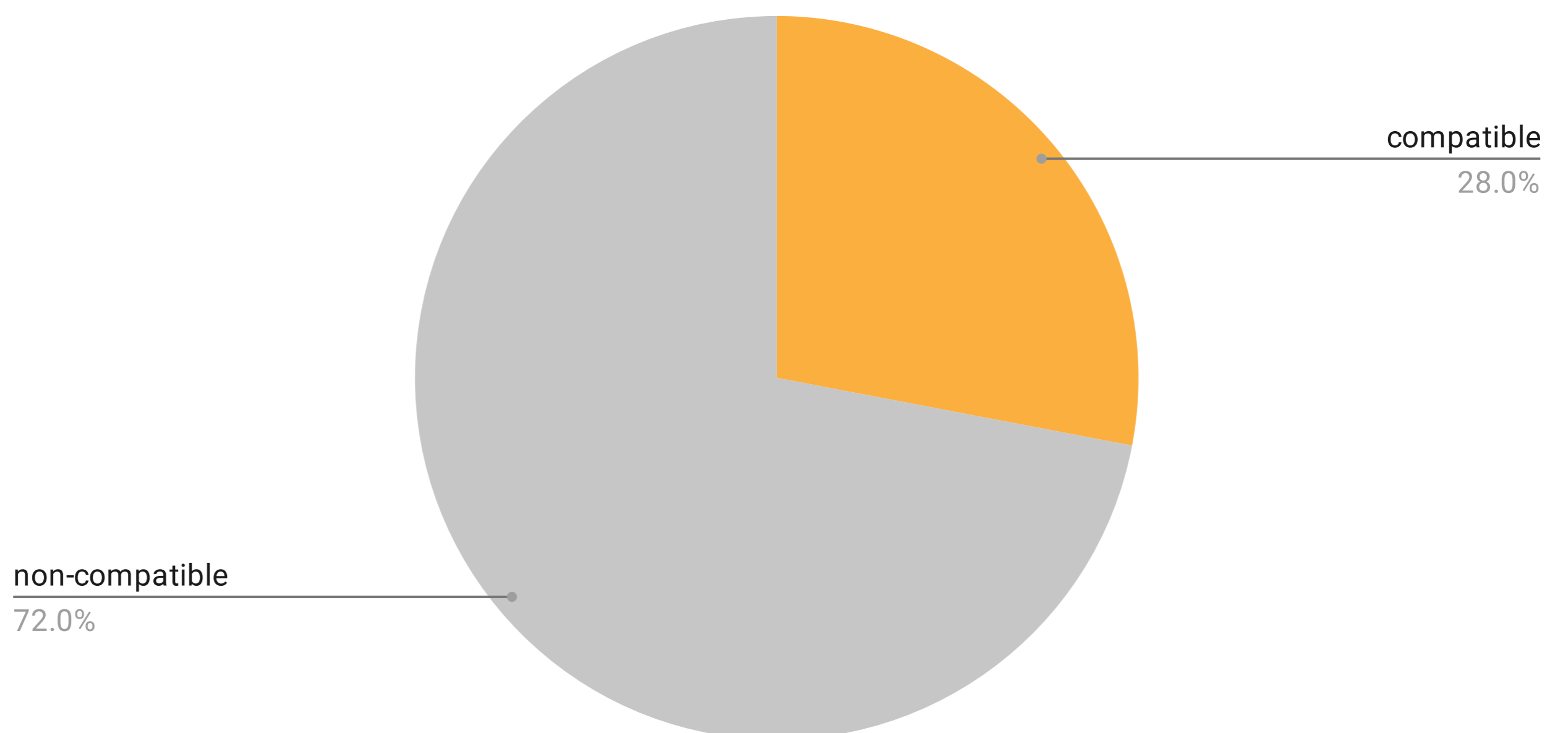Fig. 31. The number of privately owned companies' websites with the International Web Content Accessibility Guidelines.
Inclusivity and Accessibility Labs Digital Accessibility Index 2022. Based on the Introduction from the Chief Executive Officer of NCBI. Source: White 3.

MYTHS ON THE NATIONAL COUNCIL FOR THE BLIND OF IRELAND

Various myths about visually impaired people do exist as per The National Council for the Blind of Ireland. Myths are listed in the diagram as per the NCBI website (NCBI).

On the NCBI website itself, there is no data on where those myths come from, the % of people who have myths about visually impaired people or if those myths are just in Ireland or globally. There is no data on the demographics o people who have those myths. NCBI explains those myths and debunks them by explaining each of them (NCBI).

This research will investigate if the public is having experience with vision assistive technologies and by that will contribute to debunking myths as listed by NCBI.

There is no evidence that in the selected academic peer paper reviews on disability include this subject.

The upcoming primary research studies will conduct an unbiased investigation on this topic excluding the word myth to not provide any direction. The aim will be to check how many people have experienced any vision assistive technologies in their life.

Fig. 32. Debunked myths about the visually impaired and blind. Source: NCBI.

PEOPLE'S AWARENESS, ATTITUDES TO AND ACCEPTENCE OF VR HEADSETS, AR HEAD-UP DISPLAYS (HUDs) TECHNOLOGIES

Greengard in the book Virtual Reality about the virtual reality emphasises the pros of Virtual Reality, although not cons. The ratio of the public attitudes in his book in a favour. This research studies will investigate the people attutdues and as well awareness, and acceptance level of Virtual Reality and Agumenatve Reality (Greengard 1-212).

Similar to studies of Tychsen and Foeller, which do tests VR headset on children age 3-10 but not follow the parent's opinions of their children involved in testing VR products (Tychsen, Foeller 151-159).

AR as a part of the IEEE Virtual Reality Conference 2022, published a You Tube video dedicated to Health and Safety in VR. Their research compared health and safety conisdertions for VR and AR but unfortunately, it was watched only 55 times, a relatively low number in the context of their 1.66k subscribers (IEEE, Video).

In a comparison, the video *Trapped in the Metaverse: Here's What 24 Hours in VR Feel Like*, published in Wall Street Journal in November 2021, was watched 4.9 million times and VR health issues were spoken about loudly and visibly (Wall Street Journal). The public comments under this video are quite negatve in response to it, however, they do mainly focus on the Metaverse. This research study will analyse the public acceptance level of Virtual Reality headsets.

The prices of VR and Ar are dropping as the market is competing which increases the sales of the product similar to what happens within smartphones, and desktop computers and eyesight is dropping down too by exposition to those products within the range of other digital screens and life factors.

In the recent academic research done on people's attitudes to buying or using products already purchased and acceptance of technologies VR and AR in comparison to their awareness of eyesight health issues and general health problems.

This research is done for the purpose of master's degree studies and is unsponsored by tech companies or any organisations. Because of that is unbias. This research project's aim is to investigate the public attitudes and acceptance towards emerging visions of alternative technologies to receive a true and honest perceptive of it. The purpose of marketing advertising is always to focus on the positive aspects of products and services to increase the sells. This research will investigate the public opinions about VR and AR, awareness of it, knowingness and willingness to try and use it for various purposes in professional as work, school, college and personal life.

My eyes hurt, my head hurts

Quote. Source: Wall Street Journal.

Fig 33. VR headsets are ban for children younger than 13 years old. Source: Tychsen, Foeller 151-159.

VR headset are ban for children below 13 years old. It causes health issues even in a short span of use (Tychsen, Foeller 151-159).

It is not clear however if the average consumer is well informed of the health issues that may be associated with VR and AR products before making a purchase.

A study by Tychsen and Foeller in 2020, to test the side effects of using VR HUDs with children aged 3-10 for session times of 30 minutes concluded that 6% of participants disengage due to motion sickness, feeling uncomfortable and experiencing discomfort.

None of the participants experienced aftereffects of flashbacks. Studies by Tychsen and Foeller were not crosscheck within adults even if researchers claimed in their conclusion, that in comparison to adults

the flashback aftereffects are quite less (Tychsen, Foeller 151-159).

The studies participate 50 participants and the exposition of time to VR was 30 minutes per two sessions. 94% of children felt disappointed when asked to end the activity. (Tychsen, Foeller 151-159).

This research study will ask the public about their time spent on vision augmentation technologies. It will also analyse their attitudes to buying VR products for children above and below 13 years old. This study will also ask adults, as the studies are dedicated to the public above 18 years if the public is aware that VR headset is banned for children below 13 years old.

VR tests on children aged 3-10
 6% of participants disengage due to motion sickness, uncomfortable, or discomfort.

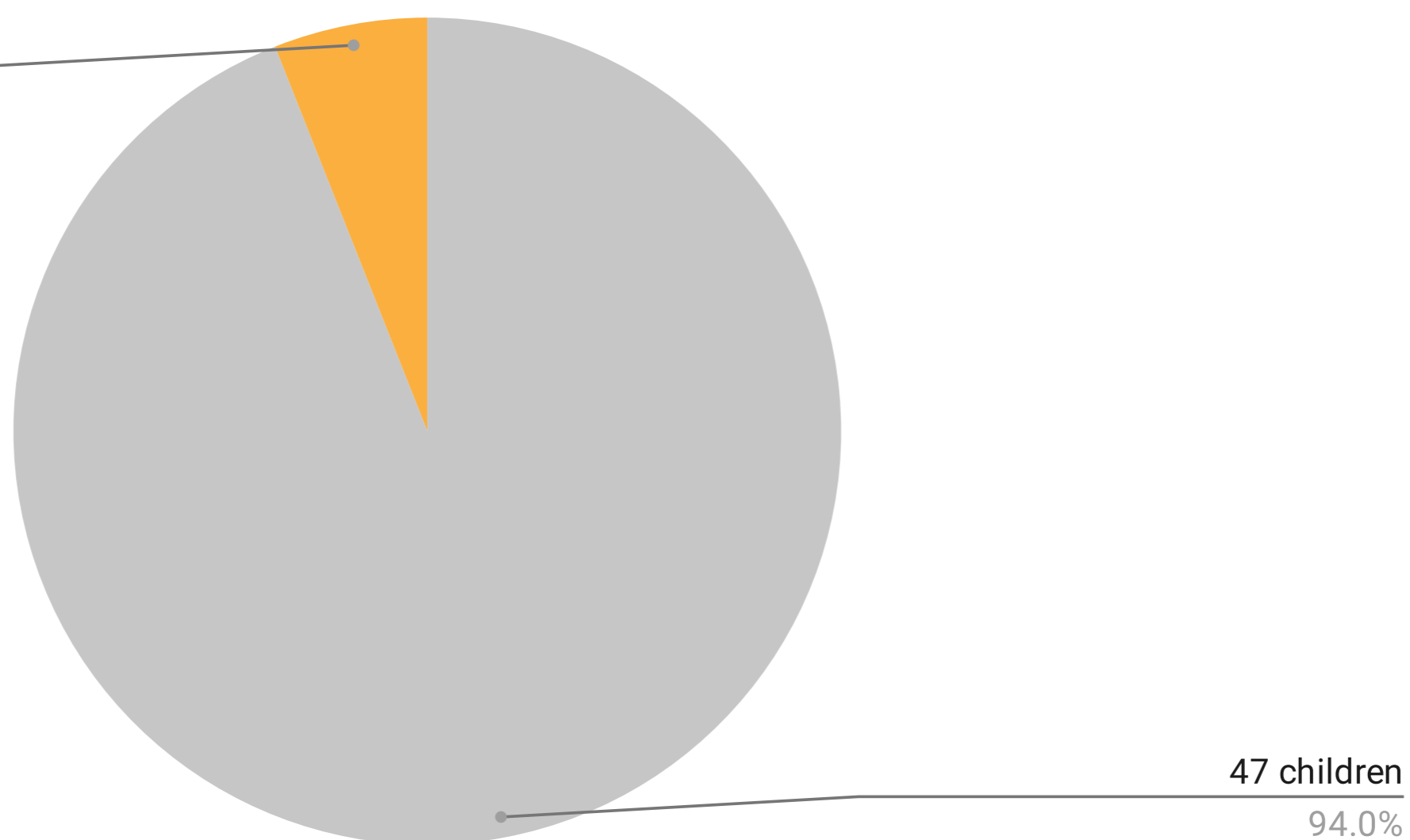3 children
6.0%

47 children
94.0%

Fig 34. VR headsets tests on children aged 3 to 10 years old. Source: Tychsen, Foeller 151-159.

The foundation of the primary research is the daily exposition of digital screens and VR/AR products. This is the crucial starting point for the primary research by increasing the number of participants and cross-checking age groups and demographic factors (usage at work/school vs home) while cross-checking general interests, hobbies, and outdoor activities vs indoor.

To debate further, more studies and following policies should be established before it is too late and health authorities should provide more data by exposing those health issues as the improvements each year in VR and AR are happening fast and the prediction of the market reached beyond the point for both due to the interest of companies e.g. Accenture and as well International Space Stations, online influencers, which popularised the products in the audience even more. (Greengard 1-18).

The buyers are growing forward for entertainment and training purposes and due to constant user testing to improve AR.

The current emergence of smart glasses due to the connection of AR glasses and VR headsets increases the potential market, which faced previous lots failures.

Users can optimise AR glasses e.g. choose to shade the real world by adjusting the front or sides of glasses to display more data more accurately, which increases adaptability like in VR. The direction of AR is changing and sales predictions are growing.

Mojo Vision AR smart contact lenses are in the early stage of prototyping and awaiting approval by the FDA (US Food and Drug Administration). One user test was done to show the stage of the development of the AR smart contact lens. The participant of the test of Moho Lens was Drew D. Perkins, born in 1963 co-founder and CEO of Mojo Vision. Smart lenses do contain a battery attached directly to the lens which is placed on the eyes. It is the current concern of Mojo Vision (Mojo Vision).

In the context of little available research about people's awareness and attitude to technologies such as AR glasses or contact lenses, this research study will conduct primary research with the general public to gather their views and perspectives.

headache

migraine

nausea

insomnia

eyesight strains

long-lasting marks

discomfort

Health issues caused by screens and devices VR / AR headsets

excessive sweat

heaviness

pressure

depth perceptions

raising body and head temperature

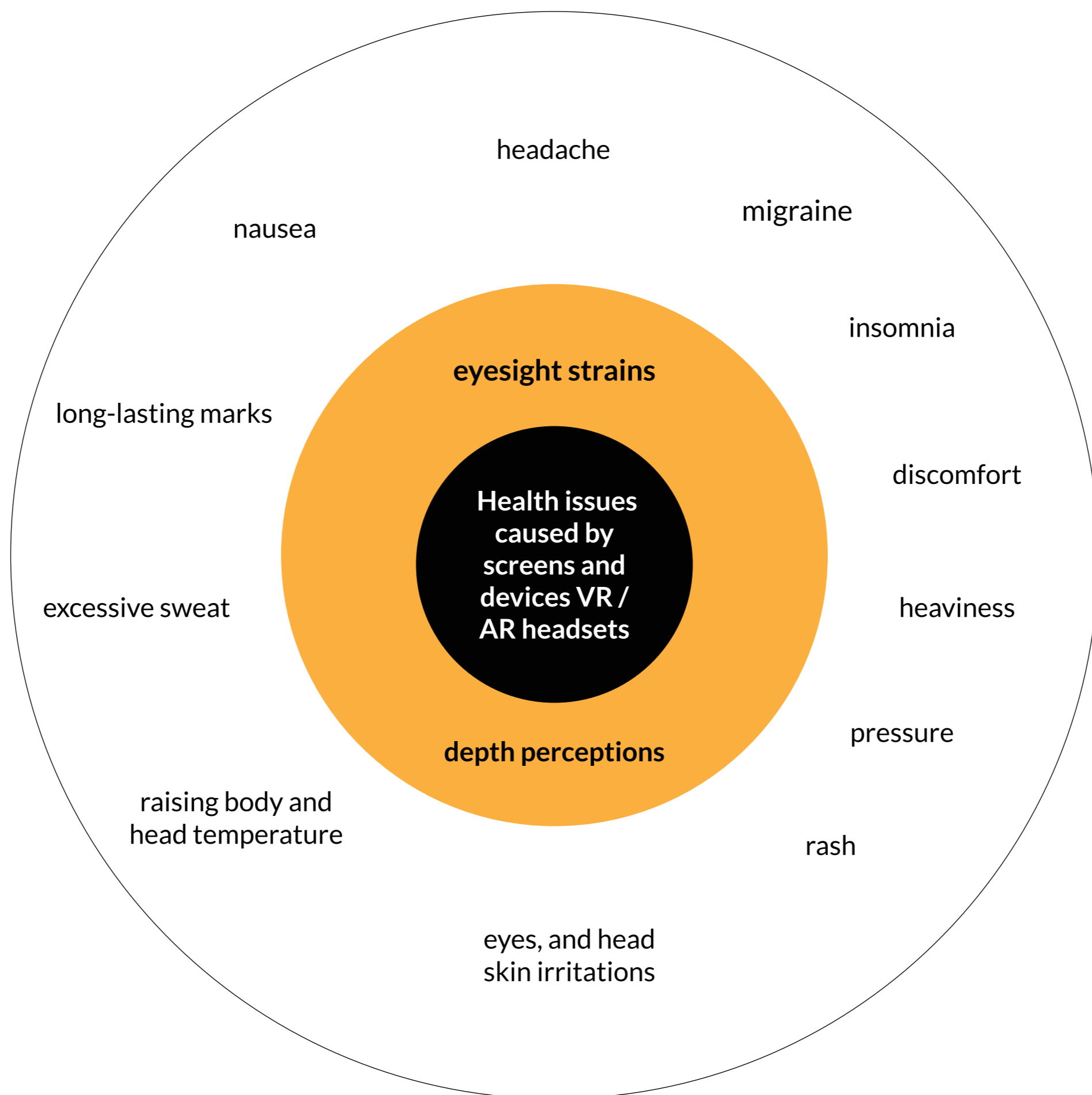rash

eyes, and head skin irritations

Fig 35. Health issues caused by screen devices and VR/AR headsets.
Source: Blehm, Vishnu, Khattak, Mitra, Yee, 253-262 and Tychsen, Foeller 151-159.

PEOPLE'S AWARENESS, ATTITUDES TO AND ACCEPTENCE OF ASSISTIVE TECHNOLOGIES FOR THE VISUALLY IMPAIRED

While many studies have been conducted to assess the public's overall perspective on disability and discrimination due to physical differences, one such example from 1988 is The politics of physical differences: Disability and discrimination by H.Hahn, they do not focus on visually impaired people and visual assistive technologies as the main focus (Hahn 39-47).

Nancy A. Brooks, conducted research on the user's responses to assistive technologies for physical disabilities (Brooks, 1417-1424). These findings from 1991 focus on users, not acceptance, attitudes and awareness among the general public. Similar studies were conducted in Saudi Arabia in 2021 also focused on visually impaired students and their network: teachers and administrators. These research studies examined the cultural attitudes to, and the impact of, stigma associated with disclosing one's disability and the use of assistive devices.

This research highlights the importance of these issues by referring to "The Social Cognitive Theory (SCT) under The Unified Theory of Acceptance and Use of Technology (UTAUT)" (Venkatesh, Davis).

However, it does not address more general public attitudes, awareness and acceptance to disabilities such as visual impairment and its related assistive technologies (ATs).

Researchers highlight the importance of social influence and the need for being socially accepted which the AT users' shared. It is important for them to have their own self-image. Often the motivation to use AT can be influenced by external factors such as public opinion. These studies also show limited awareness of visual disability among the general public who they say take eyesight for granted if not having contact with a visually impaired person in their own life. Even University staff were unaware of the importance of training people with healthy eyesight to be aware of ATs (Al Shehri, Almalki, Alshahrani, Alammari, Khan, Alangari 1-5).

The researchers conducted the surveys with the visually impaired people without crosschecking the public attitudes to the findings and how would they feel about collecting their personal data without their permission.

This project research would first focus on the awareness of the public about AR glasses, and their usage for professional and personal needs and wants, if any. This project will also investigate their overall opinion, acceptance and attitudes levels towards AR.
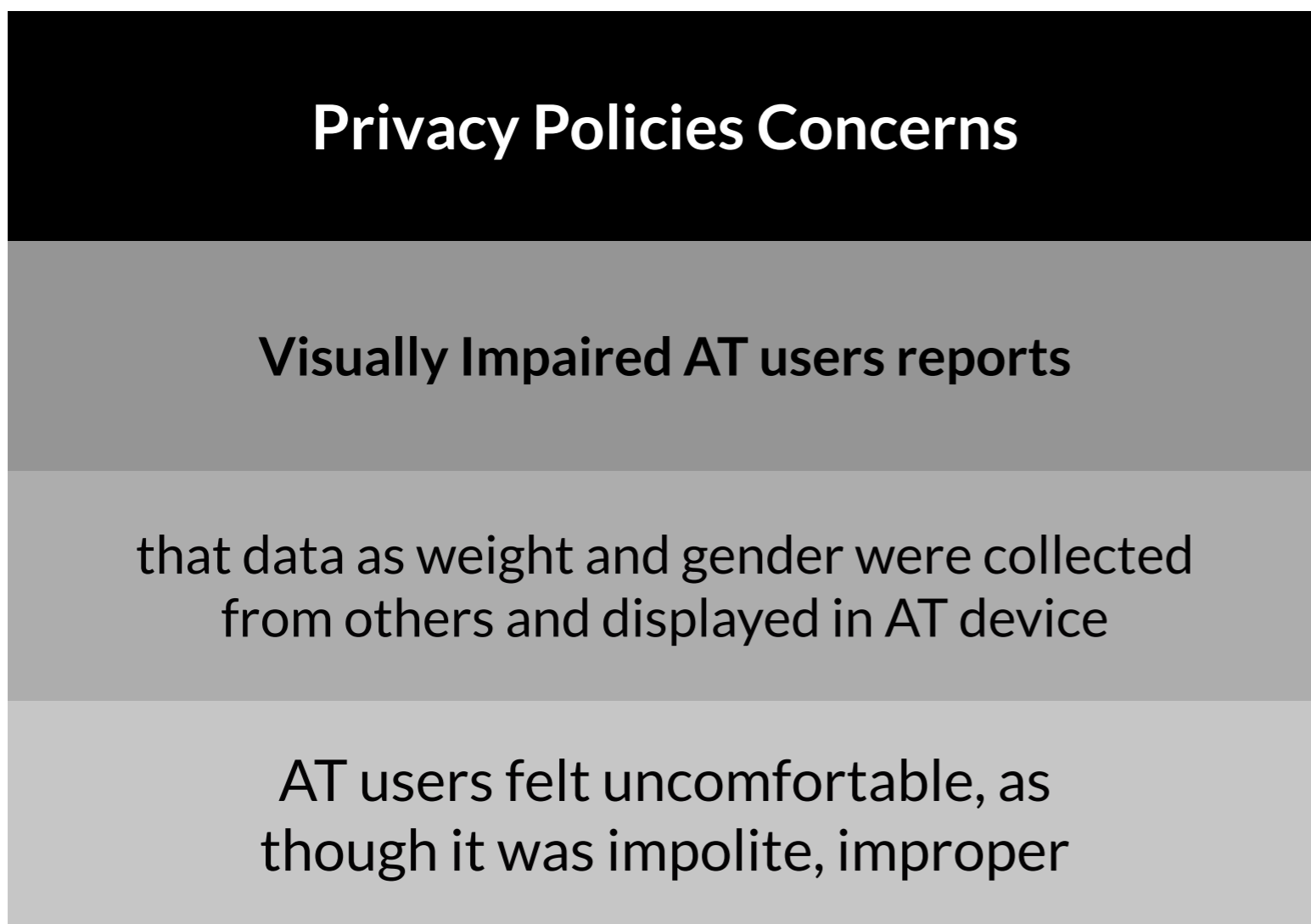
Privacy Policies Concerns

Visually Impaired AT users reports

that data as weight and gender were collected from others and displayed in AT device

AT users felt uncomfortable, as though it was impolite, improper

Fig 37. Privacy Policies Concerns raised by visually impaired Assistive Technologies users.
Source: Akter, Ahmed, Kapadia, Swaminathan 1-5.

The most recent Irish research commissioned by The National Disability Authority (NDA) in 2012, *Research on the provision of assistive technology in Ireland and other countries to support independent living across the lifecycle*, compared Ireland with several countries in Europe.

It argued that all AT provision in various settings e.g. health and social care system, employment and education should be strengthened by the HSE and NGOs communication. The UN Convention on the Rights of Persons with Disabilities (UNCPRD), under Article 4, states that Member States together with WHO's International Classification of Functioning, Health and Disability (ICF, 2001) have an obligation to promote and undertake research and development of ATs.

In the context of this research, the National Council of the Blind in Ireland (NCBI) is the prominent Irish organisation advocating for the use of Visual AT in organisations by initiating awareness campaigns, providing online discussion forums and offering Assistive Technology Acquisition grants (ATAG). The NDA report does not mention public or social awareness about the NCBI or AT, other than explaining how a visually impaired person can be referred by an educational trainer, family member or medical professional to to the NCBI. It focuses mainly on disability legislation, policies, and services.

The research studies mentioned above make a signifant contribution to the entire spectrum of AT and disabilities but their focus is limited to the relatives of the visually impaired and the professional sector within Electronic Assistive Technologies (Cullen, McAnaney, Dolphin, Delaney, Stapleton 5-55).
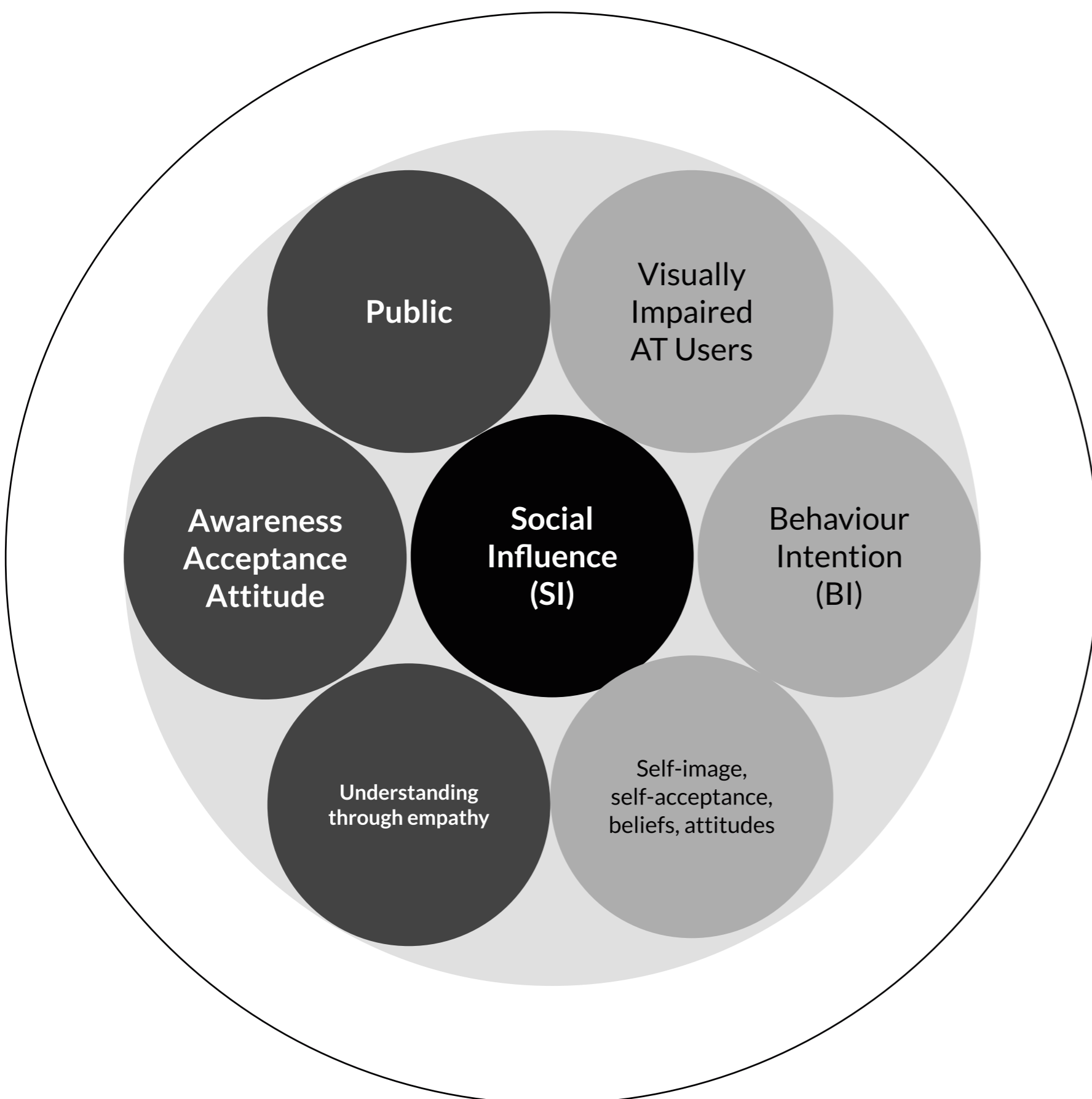

Fig 36. Social Influence (SI) importance on Behaviour Intention (BI) of visually impaired Assistive Technologies users.
Source: Al Shehri, Almalki, Alshahrani, Alammari, Khan, Alangari 1-5.

GOVARNMENT REGULATIONS

The Assistive Technology Act was established in 1998 and supported by States Grants for individuals with disabilities in the USA. It started to be recognised globally and became part of The Employment Equality Act of 1998, which came into effect on 18 October 1999 in Ireland. For the first time, disability discrimination became illegal in Irish Law and from this moment on, disability awareness started to increase within educational employment and social contexts (Cullen, McAnaney, Dolphin, Delaney, Stapleton 3-18).

Unfortunatlely, there have been little or no development in laws or policy relating to vision enhancement technologies and their impact on eyesight health or future prevention of vision impairment.

To debate further, despite additional concerns about ethics, data privacy, and social consequences (Greengard 153-184) there are no health eyesight policies relating to the use of virtual reality (VR) and augmented reality (AR) except for prevention of use by children younger than 13 years old.

This research seeks to explore what are the implications of this gap in both awareness and legislation relating to the use of vision enhancement technologies on eye health in the general population.

This research seeks to review public attitudes towards health and safety warnings and recommendations. VR headsets and AR glasses do have warning signs and packing including information on how to use it safety.

Unfortunately, there have been no data about it in the selected peers' academic papers.

CONCLUSION

Most of the research is concentrated on privacy policies highlighting the relationship of the users, products, or devices collecting users about other people's private details without permission.

The contribution of this research study will focus on public awareness, attitudes and acceptance of vision augmentation technologies, in relationship to eyesight.

My research contribution is based on the lack of materials specifying the relationship, connection and opinions of the public on current innovative technologies for augmenting human vision.

This discovery is surprising as we are living in a time of vast online communicators and online and social media.

However, the omission of public opinion on these technologies is critically important to ensure future technologies will be safe to use and to minimise any risks to human vision.

Public voice can shift resources in a favour of discoveries, laws and policies that are ethic, safe and inclusive.

It is timely to conduct research which takes society into account as the primary influence on next stage development for vision augmentation technologies available on the market.

DESIGN
METHODOLOGY

DESIGN METHODS AND STRATEGY
APRIL - JANUARY 2023

RESEARCH QUESTIONS
PROJECT PROPOSALS

From research proposals on the topic of bionic limbs and smart prostheses, across the entire human augmentation of body and mind including futuristic posthumanism to focus on the general public awareness, attitudes and acceptance and one specific sense: eyesight, within current assistive and augmentation technologies for vision. This research journey was fascinating from the early start to the end.

The researcher and designer's professional background is in both, graphic, UX/UI design for Health Tech and direct contact with visually impaired people over a significant period of life through the design itself for the final BA Honours in Design, work experience and volunteering.

Fundamentals like that help a lot to define the area of research due to the natural interest in the human body, anatomy, and health with established values of compassion and empathy towards others.

While at the same time researcher is truly intrigued by where the human body and mind augmentation will take the in upcoming years with emerging technologies.

The areas of interest and experience, both professional and personal brought a well-combined subject, which aims to develop a strategic career plan for this specific area to become an expert in it by identifying public awareness, attitudes and acceptance levels within the vision augmentative technologies.

The designer's purpose is to furthermore understand the current public relationship with AT, digital devices, and VR/AR. The researcher desired to have a mission within the vision to genuinely help those who need it and the national and global health sector itself.

CHARRETTE WORKSHOPS
FACILITATIONS

The facilitation of the Charrette workshop happens in person on the IADT campus, in a dedicated and open place in the library between 26-30 September with the final presentation on 30th September.

The deadline report was until the 14th of October, and it was submitted by the 7th of October with successful feedback. Students in the 3rd year of Business Management and Animation Students took part in the workshop on Human Body and Mind Augmentation.

Because of their tremendous open-minded and engaging contribution as a focus group, the research helped evaluate the thesis and direct it towards the final proposal with a focus on eyesight. Active listening, taking the constructive feedback into account from all supervisors, and discoveries conducted by Charrette participants was an important aspect of the design process, which was highly appreciated.

All questions and feedback directed from Charrette's presentation audience, classmates, and students were beneficial, inspiring and helpful and taken into account and implemented.

The future workshop is planned based on the valuable feedback to be more flexible and less structure oriented to provide more time for the initial set of skills of participants. During Charrette team and project values were established, which helped us all grow and engage in friendly activities while working together.

The charrette's purpose was to explore Human Augmentation. Valuable insights were found because of amazing participants who shared openly their ideas and thoughts and engaged in activities. The focus was to discover the subject first, understand, and evaluate the resources, discover the potential insights, and define by narrowing it down.

Manual and digital tools such as Miro, Slidesgo were used, as personal and library laptops.

Resource, research and design were done online and in hard copies. See Appendix.

SECONDARY RESEARCH
LITERATURE REVIEW

Desk-based research in form of a literature review is based on the book *Real World Research* by Colin Robson. During the research stage: discovering, the literature review went with depth into broader subjects.

Then during the defining narrowed them down to aim for focus within the scope of the final proposal meaning what is the public's awareness, attitude to and acceptance level of vision augmentation technologies (Robson 15-41, 83-100).

Collecting sources to be able to read through, review and discover the gap to fit this research proposal was truly extraordinary as it went through several different routes of discovery until it emerge to define into one.

With the support of Charrette participants, and supervisors' feedback the researcher was able to clearly see where the rule mission is.

The initial literature review needs to be redone and start again. However, it is always beneficial learning as gave an extra essence to the final project.

DESIGN STRATEGIC METHODS, PROCESSES AND PLANNING

Design strategic methods are based on resources available online on websites such as Nielsen Norman Group and Ideo. Combination of **Design Thinking** within principles of **Human Centre Design, UX Design Research, Lean UX and the Double and Triple Diamond Design Process Model, Design Process Planning, SWOT**, etc. and techniques together by as well aiming for inclusive, diverse and accessible design (Nielsen Norman Group and Ideo).

All those methods benefit research and help with production design planning as well as implantation of it while at the same time being flexible and open to change and possible challenges to overcome. Because of that, the process has much more strengths and opportunities than threats and weaknesses.

The methods are the tools, and ways of approaching the research and cannot be rigid and too stiff. What was learned through the 1st and 2nd years of master studies is that the best approach is to be open to various methods, and techniques and strategically implement aspects of all, or parts which by combining bring the best results and this could be transiently observed while conducting each phase, analysing and coming back to adjust what necessary.

Design is always involved, changing, and adapting and the methods should be fluid too. Design methods do overall each other and have similar phases and aspects.

Indeed very helpful was the **Tunnel Technique** which helped to identify the aims and objectives, both personal and project, finding the actual problem definition by looking openly at the project research rationales based on the discovered gaps in the peers' academic papers. The tunnel supported the entire process from the start to the end to be more and more specific, clear and consistent to touch the subject as close as possible.

PRIMARY RESEARCH ONLINE SURVEY

Primary research in form of an online survey is based on the book *Universal Methods of Design* by Bruce Hanington and Bella Martin, as well as *Design for Cognitive Bias* by David Dylan Thomas, an previously mentioned resource in Literature Review and Design Strategic, Methods, Processes and Planning (Hanington, Martin 1-264 and Thomas 1-106).

A successful combination of design methodologies helped to decide that conducting the primary research in form of an online survey is the best design method.

The quantitative data were major to be collected to find out the connection between awareness, attitudes and acceptance supported by the Qualitative data collected in form of ratings.

The survey aims to answer the research question what are the awareness, attitudes and acceptance levels amongst the general public to vision augmentation technologies? The participant's answers helped to identify the insights to answer the research questions and come up with ideas for design artefacts and establish further future steps. **The survey was open to participants for 2 weeks.** The survey was sent via online channels such as WhatsApp, Slack, Email and LinkedIn and participants could share it if they wish it, which did increase the number of participants overall. The survey was dedicated to adults who are 18 years old. It was anonymous. **90-95% of participants never met in person or online.**

More than 40 participants left their contact details to be contacted. The survey contacted multiple and singular and rating option answers to 44 questions with the 45 to leave the contact details as optional. Lots of positive feedback was received as interested in the topic and how questions were conducted.

None dropped from the survey and more than 160 participants took part in it, which is a great success. On average time to complete the survey was 7 minutes to a max of 9 minutes. Some participants left the survey open and engaged in other duties, then come which increase the average time. **IADT MS Forms** student accounts were used and it was extremely well apart from branching which was excluded as was not effective for questions for Yes and No during the initial prototype test. The survey before reaching the participants was reviewed by the supervisor, initially had fewer questions, and then more and an eventual middle point was found.

Initially, images were intended to be used but strategically excluded to let questions be as unbias without any direction. Thank you note to those participants whose contact back was sent with Merry Christmas and Happy New Year wishes. Extremely grateful that it went so well and that there is a great number of participants willing to take further research, which is proposed in the Next Steps.

SOLUTION PRODUCT PROPOSAL AND TESTING

While having clear insights from the results of the survey, the solutions came out of it and potential product and/or service designs.

Lots of creative ideas for the final product came out however, with constraints such as timing, one was chosen for design and testing to collect feedback. Within the next steps, the plan is to successfully iterate the chosen one and then design other solutions, test, receive feedback and implement them.

For the purpose of finalising this research project, the most valuable product based on the supervisor's feedback was created as an initial draft version.

Testing was done with chosen participants in the survey who were genuinely happy to be contacted again.
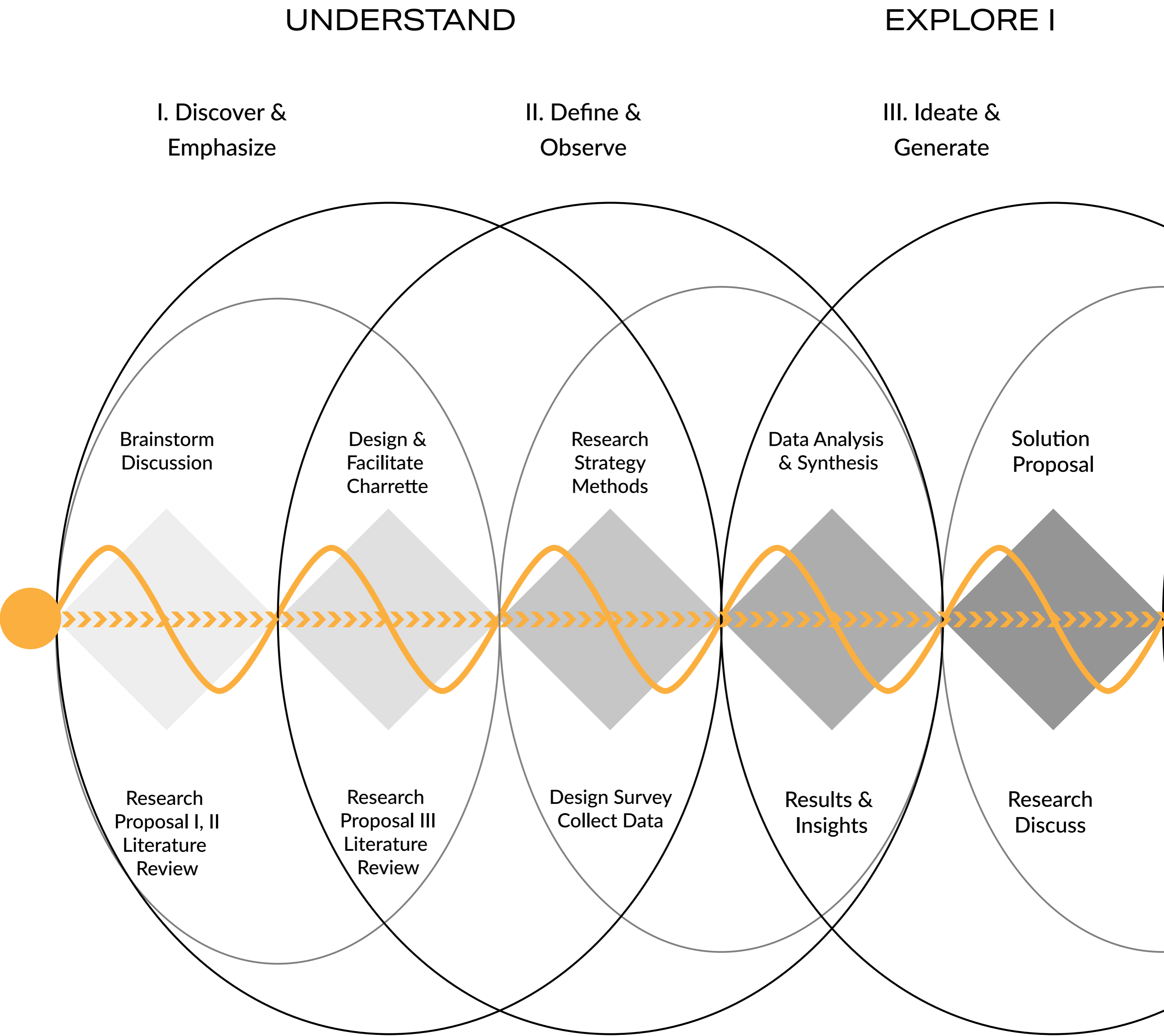
DESIGN PROCESSES
DESIGN PRODUCTION SCHEMA 1

UNDERSTAND

EXPLORE I

I. Discover & Emphasize
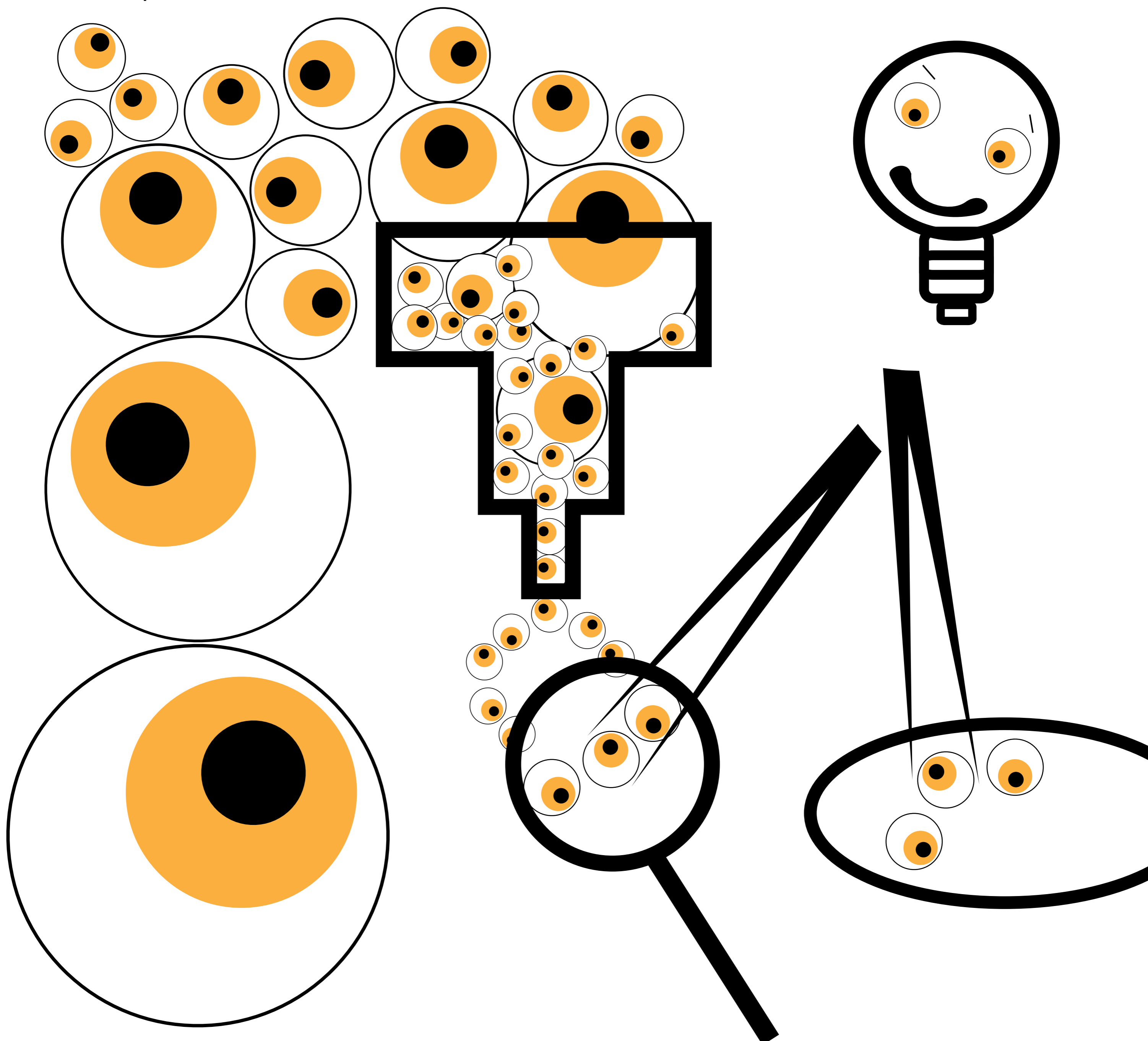
II. Define & Observe

III. Ideate & Generate

Brainstorm Discussion

Design & Facilitate Charrette

Research Strategy Methods

Data Analysis & Synthesis

Solution Proposal

Research Proposal I, II Literature Review

Research Proposal III Literature Review

Design Survey Collect Data

Results & Insights

Research Discuss

Fig 38. Design Processes. Design Production Schema 1.

EXPLORE II

MATERIALIZE

IV. Prototype & Build

V. Test & Receive Feedback

VI. Implement & Share the Story

Design Strategy

Design Product

Test Product

Submit Final Project

Portfolio Publication

Build Demo

Prototype Product

Collect Feedback Iterate

Committee Review

Next Steps
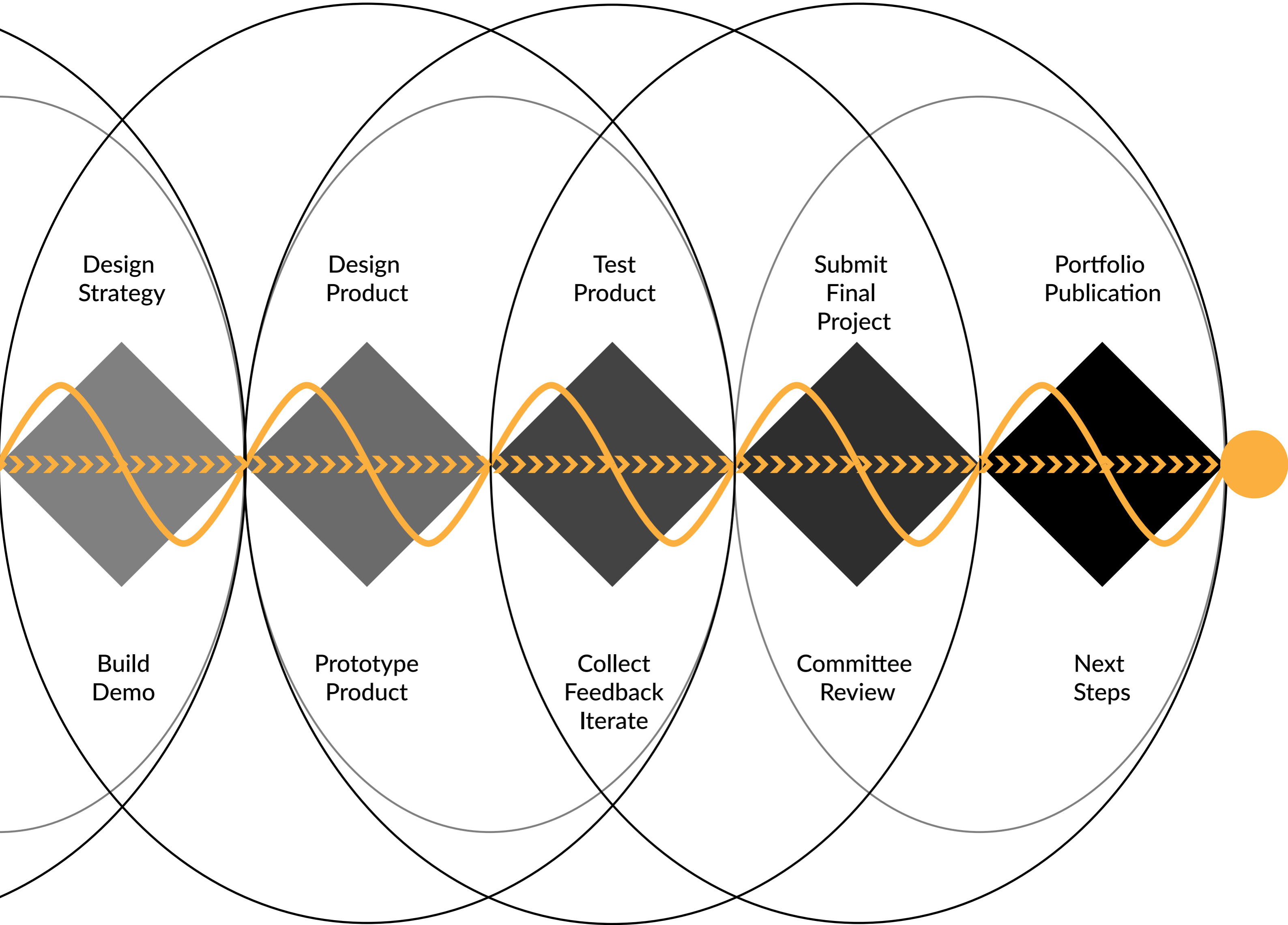
DESIGN PROCESSES
DESIGN PRODUCTION SCHEMA 2

UNDERSTAND

EXPLORE I

I. Discover &
Emphasize

II. Define &
Observe

III. Ideate &
Generate

Fig 39. Design Processes. Design Production Schema 2.

57

EXPLORE II

MATERIALIZE

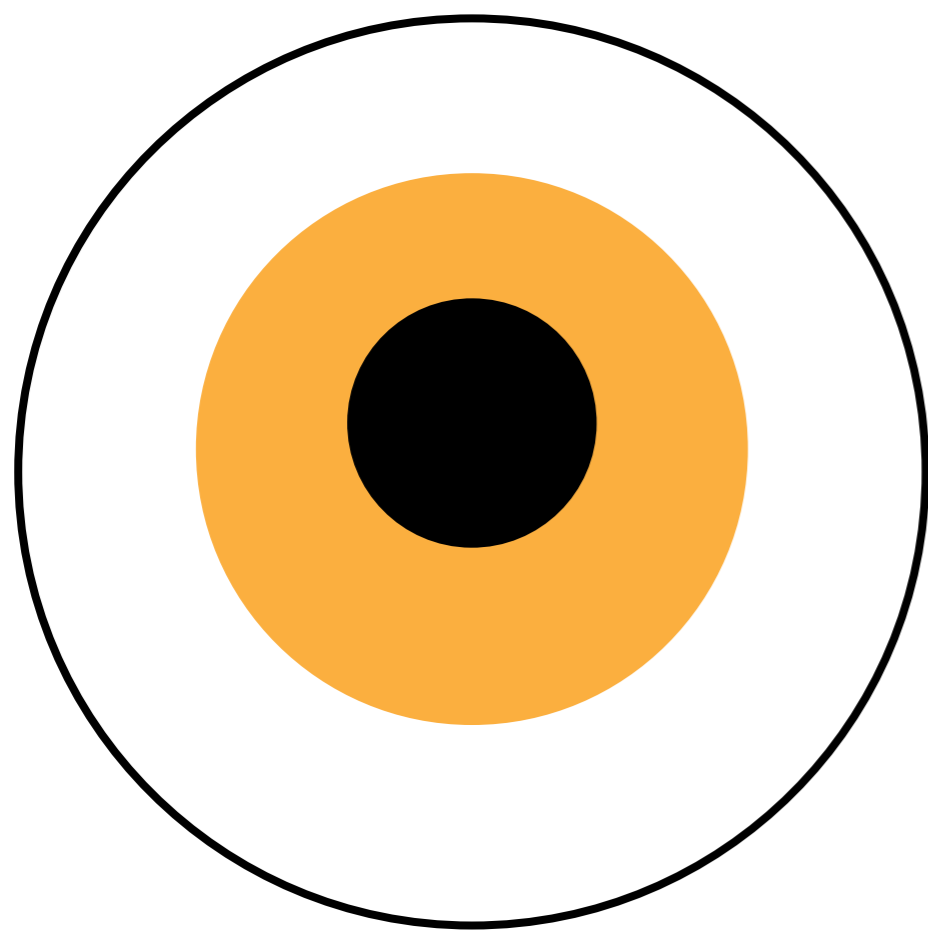### IV. Prototype & Build

V. Test & Receive Feedback

VI. Implement & Share the Story

3 for 1
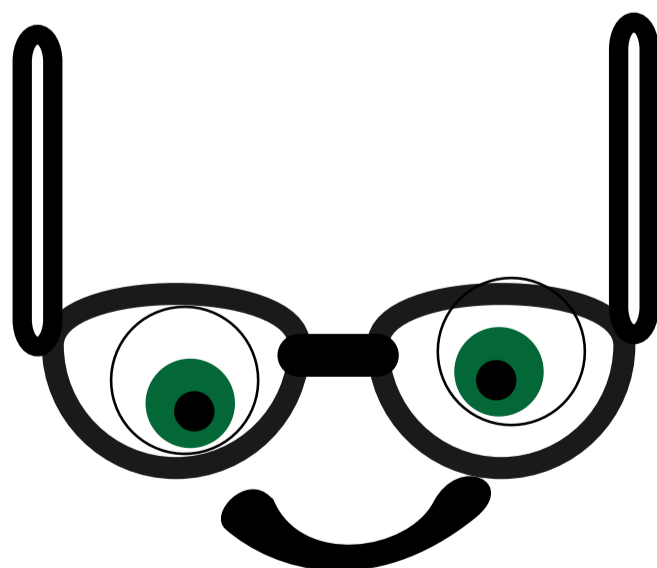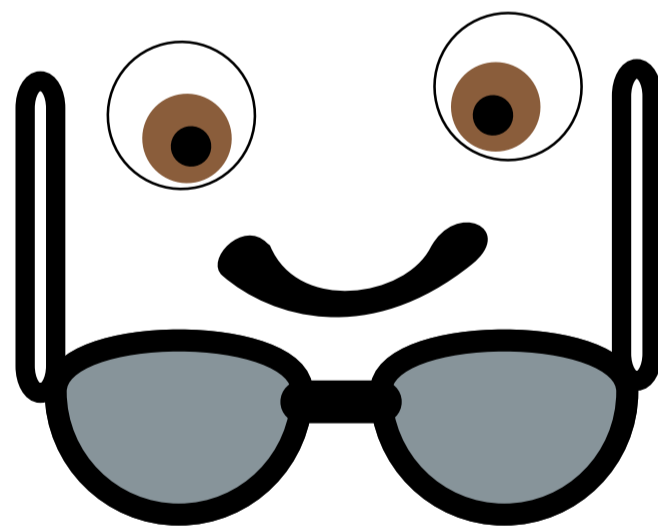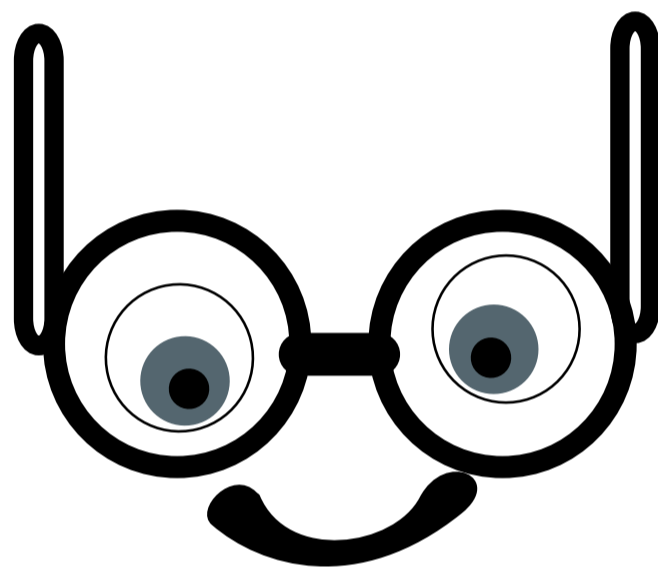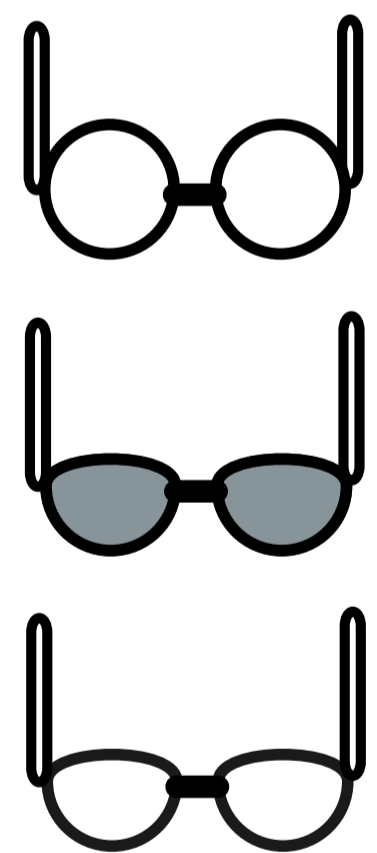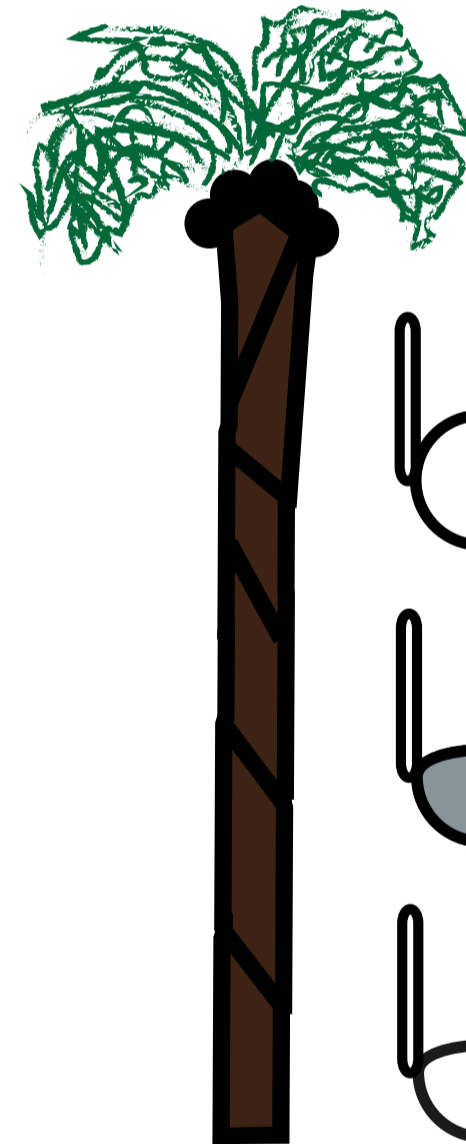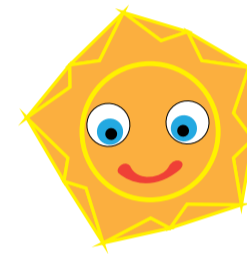
PRODUCTION TIMEFRAME
APRIL 2022 - JANUARY 2023

APRIL - JUNE

April

Literature Review - Research & Writing

Design Thinking - Discover & Define

I Research Thesis Proposal - Writing
Area of research: Bionic Limbs - Smart
Prostheses

May

I Research Thesis Proposal - Submit
Area of research: Bionic Limbs - Smart
Prostheses
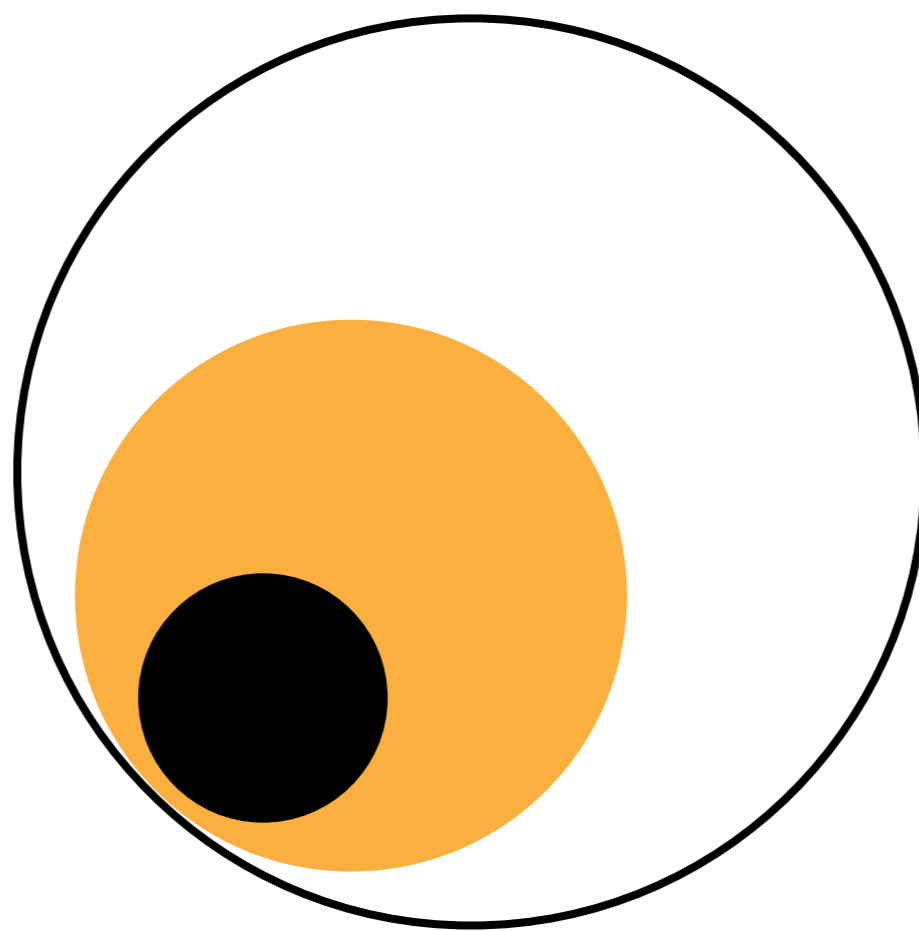
June

Supervisor Meeting
Due to ethical, constraints, reframing the bionic
limbs to the Augmented Human Body and Mind

Literature Review - Research
Design Thinking - Discover & Define
Design methods - approved

II Research Thesis Proposal - Writing
Area: Future of Augmented Human Body and
Mind within Posthumanism

JUNE - JULY

June-July

Literature Review - Research & Writing

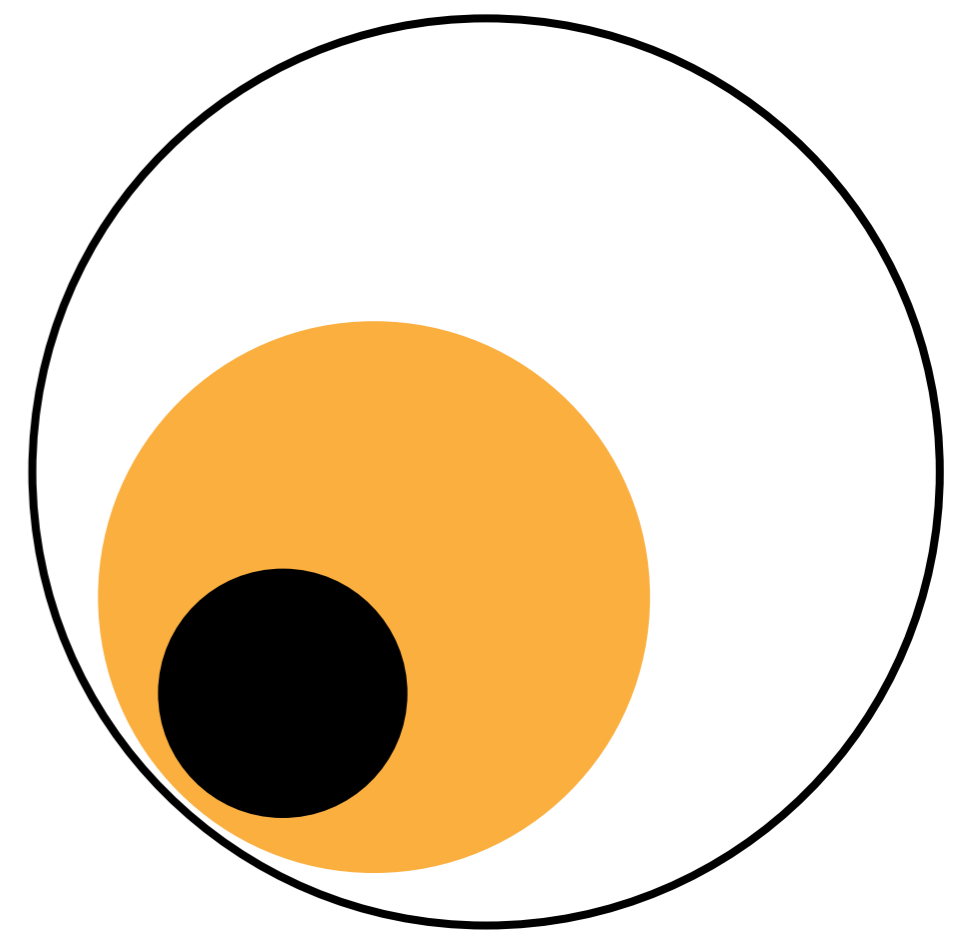**Design Thinking** - Discover & Define

August

Literature Review - Research & Writing

Design Thinking - Discover & Define

II Research Thesis Proposal - Iterating
Area: Future of Augmented Human Body and
Mind within Posthumanism

Charrette Workshop - Preparation

SEPTEMBER

September

Literature Review - Research & Writing

II Research Thesis Proposal - Submit
Area: Future of Augmented Human Body and
Mind within Posthumanism

Design Thinking - Discover & Define

Charrette Workshop - Preparation & Submit,
Iterate, Accepted

26-30 September
**Charrette Workshop Facilitation and Learning
from Participants**
Design Thinking - Discover & Define
Area: Future of Augmented Human Body and
Mind within Posthumanism
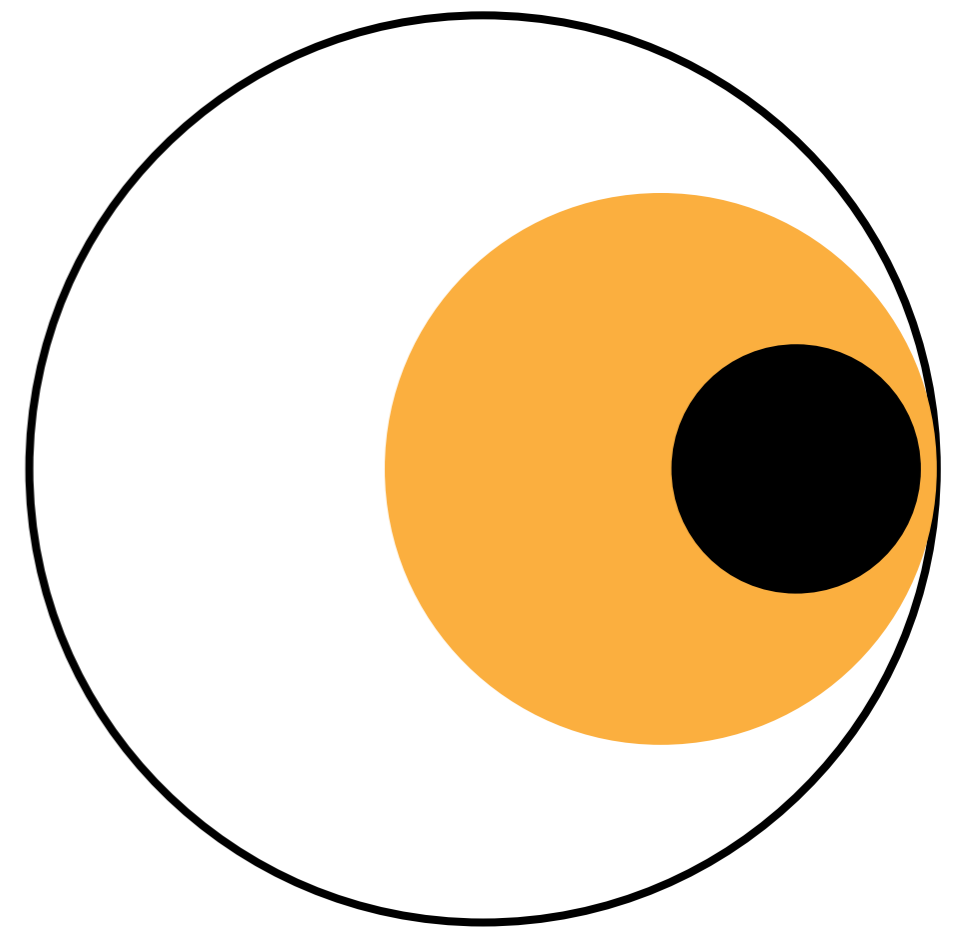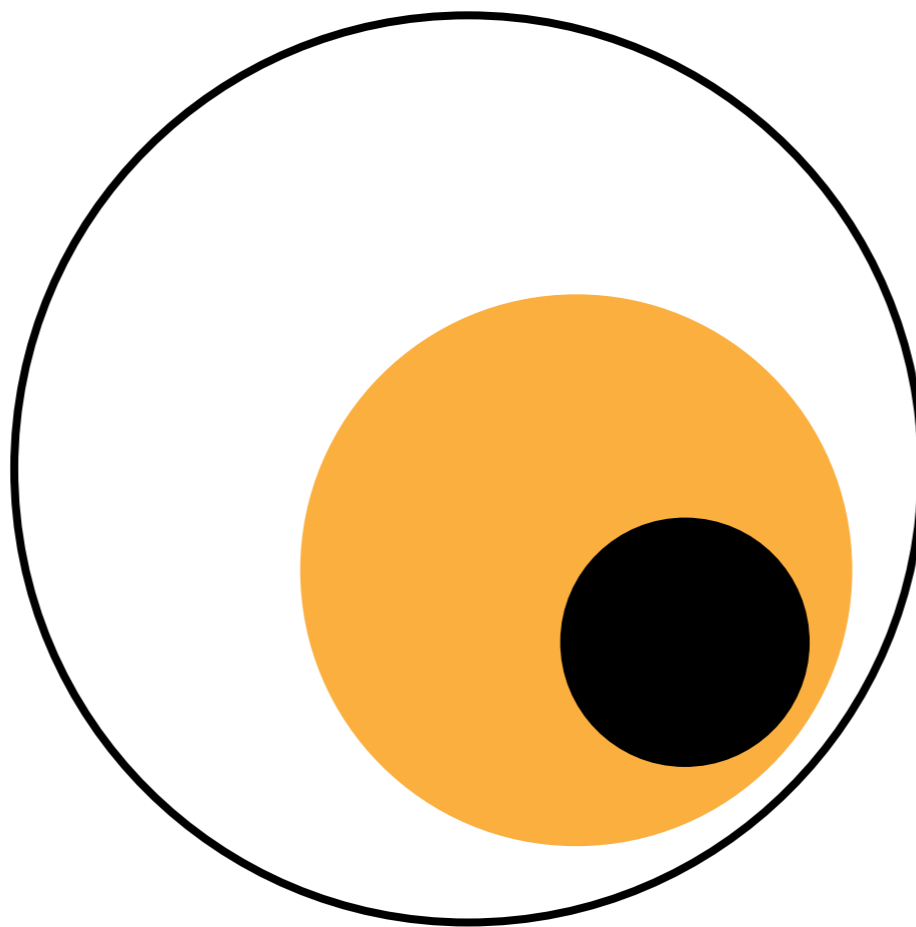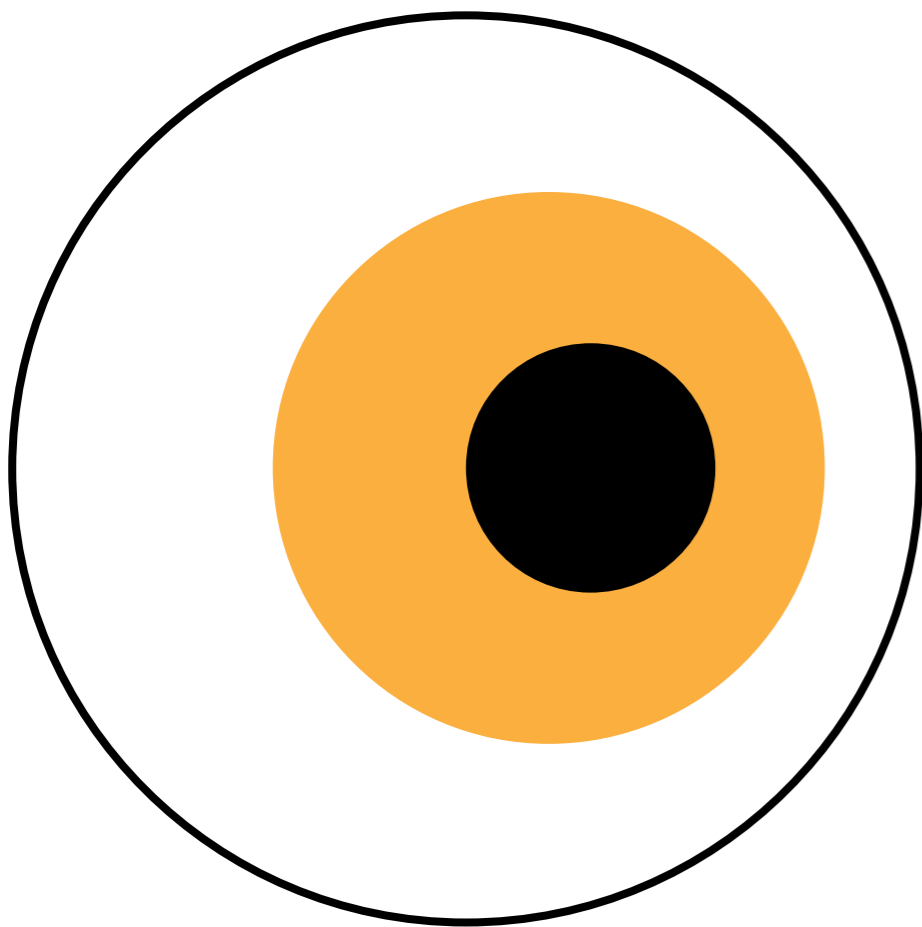**Charrette Workshop Presentation**

Supervisor Meeting
Due to the dystopian future of Posthumanism
reframed only to the Augmented Human Body
and Mind

Charrette Report - Writing

OCTOBER

NOVEMBER - DECEMBER

JANUARY

October

1-14 October
Charrette Report - Writing, Submit on
the 7th of October
- Feedback, Approved

Advisors and Supervisor Meeting - Feedback on
Thesis Topic and Design Process

**Research and Design Task: Human Form
Augmentation Map** - Poster Design, Submit,
Feedback, Iterate, Keep as
an extra artefact if needed

Supervisor Meeting
III Research Thesis Proposal - Proposed
- Accepted
Area: Public awareness, Attitudes and acceptance
of the sense of eyesight augmented technologies

Literature Review - Research & Writing

Design Thinking - Discover & Define
Design and apply Methodology, Process

**Research and Design Task: Timeline Eyesight
Augmentaton** - Poster and Book Design, Submit,
Feedback, Iterate, Keep as
an extra artefact if needed

November

Supervisor Meeting
III Research Thesis Proposal - Reframe title to
Vision instead Eyesight, Accepted

Literature Review - Submit

Design Thinking - Discover, Define and Design

Advisors and Supervisor Meeting - Feedback on
Thesis Topic and Design Process

Primary Research - Design Survey

December

Supervisor Meeting - Feedback on Design
Process, Survey

Literature Review - Feedback, Iterate, Submit,
Approved

Design Thinking - Discover, Define, Design, Test

Survey - Submit, Iterate, Approved, Collect Data

Report Thesis - Writing, Survey Data, Insights,
Designing Solution Products x 2 based on
findings, Personas, Testing Phase

January

Final Touches

Testing Phase - Artefacts: Solution Products

Draft Final Project Report - Submit
the 3rd of January

Template Posters - Adapt, Submit
the 5th of January

Supervisor Meeting - Feedback, Iterate, Approved
the 5th of January

Final Project - Print, Submit, Delivery in person
soft (online) and hard (print) copy
the 9th of January

Presentation - Design, Feedback, Approved

Supervisor Meeting
the 10th of January

Presentation for Committee Panel
the 11th of January

PRIMARY
RESEARCH
RESULTS & INSIGHTS

A survey is an act of process of asking questions of selected volunteered individuals to obtain data about a specific topic.

The aim of the gathered information from the sample of people is to understand the population as a whole in the specific demographics such as age and/or location.

The aim of this online survey is to collect data about the general public awareness, attitudes towards and acceptance level of vision augmentation technologies.

Data collection surveys collect information to observe the parallels and/or polarities to collected data, analyse it, and synthesise it to aim for the results and insights.

The strategy for solution product proposal and the following stages, building, prototyping, testing and then collecting feedback were designed based on the survey's results and insights.

Survey Title:
Primary Research, Method - Survey, Subject: Vision Augmentation Technologies.

Survey Message:
Hello + Welcome!

Thank you for taking the time to complete this survey, your feedback is greatly appreciated.

This survey is voluntary and should take about 7-9 minutes. All answers are anonymous. Taking part in the survey can be left at any time.

By taking part in this survey you confirm that **you are over 18 years old.**

This survey is part of my Masters in Design for Change that I am undertaking at the **Dún Laoghaire Institute of Art, Design & Technology (IADT)**, Ireland in collaboration with the Institute without Boundaries, George Brown College, Toronto, Canada.
The title of my research is:
What are the attitudes, awareness, and acceptance levels amongst the general public to vision augmentation technologies?

The aim of this survey is to collect data on public awareness, attitudes, and acceptance of vision augmentation technology such as virtual reality (VR) and augmented reality (AR).

It is optional to leave your email address at the end of the survey if would like to be contacted in the future to further participate in this research.

If you wish to get in touch, my contact details are k.hasnik@gmail.com.

Thank you for your time.
Kind Regards,
Katarzyna Haśnik

NUMBER OF PARTICIPANTS

163 responses which is a huge success. None dropped out from the survey.

Only 2 questions were mandatory, age group and place to live. 45 questions including 1 to leave the contact details. 43 participants are willing to be contacted for further studies, which is more than 1/4 of the total number. Those participants had been contacted to test the solution product proposal.

The survey was open for more than 2 weeks to collect as many answers as possible through What's App, Slack channels, LinkedIn and Email.

DEMOGRAPHICS

The basic demographic questions were collected as age, gender, and location.

DESIGN SURVEY - IMPLEMENT - COLLECT - UNDERSTAND

AGE

The priority of this study was to observe the correlation between two age groups 18-49 years old and 49-65 or older and their awareness, attitudes and acceptance level of vision augmentation technologies.

Those age groups were divided based on the WHO and NBCI statistics.Both age groups do have similarities in their awareness, attitudes and acceptance level of vision augmentation technologies described further within the following diagrams. Non-significant difference was observed.

Age group

28 participants

50-65 or above
17%

135 participants

18-49
83%

Fig 40. Survey results of the age groups of participants.

GENDER

The research study's aim was to observe a correlation between genders if applicable. Gender question was optional.

More females, 57% than males, 41% took part in the online survey and only 2% of prefer not to say. 4th category, other, left as blank.

All genders do have similarities in their awareness, attitudes and acceptance level of vision augmentation technologies described further within the following diagrams. Non-significant difference was observed in terms of differences between genders.

Gender

Prefer not to say
2%

Male
41%

66 participants

93 participants

Female
57%

Fig 41. Survey results of the gender of participants.

LOCATION

The research's aim was to observe a public mainly in the Republic of Ireland, as well as European Union countries and Non-Euroepan Union Countries in Europe including the United Kingdom. To increase the number of participants and as well be able to observe any difference in awareness, attitudes and acceptance levels of vision augmentation technologies, the survey was open to other locations such as North America.

Africa, Asia, Australasia, and South America were also taken into account however no significant data was collected due to limited numbers.

Regardless of the locations, the awareness, attitudes and acceptance levels are parallel with each other and location doesn't give a significant difference.

Place to live
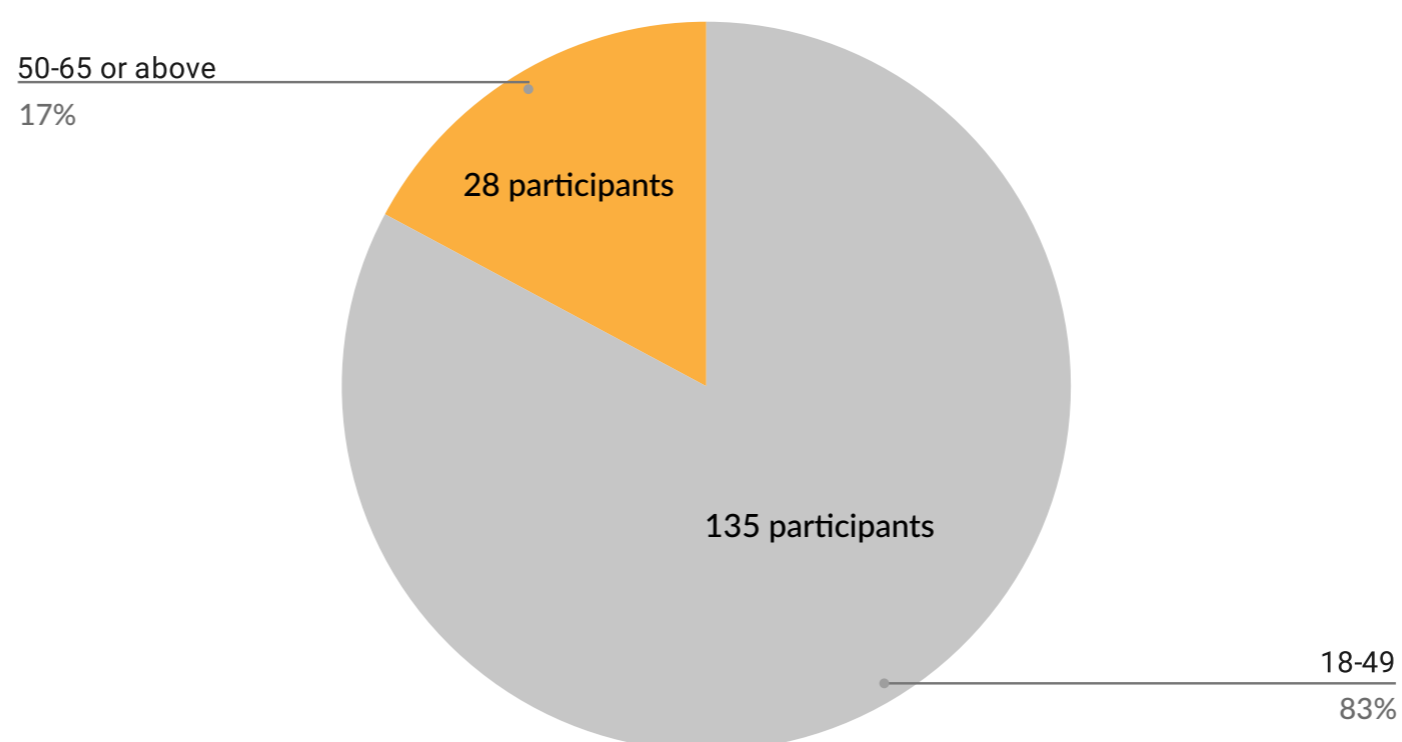
Other
7.3%

North America
24.4%

30 participants

9

European Union
9.8%

52

UK and Non-EU
6.5%

8

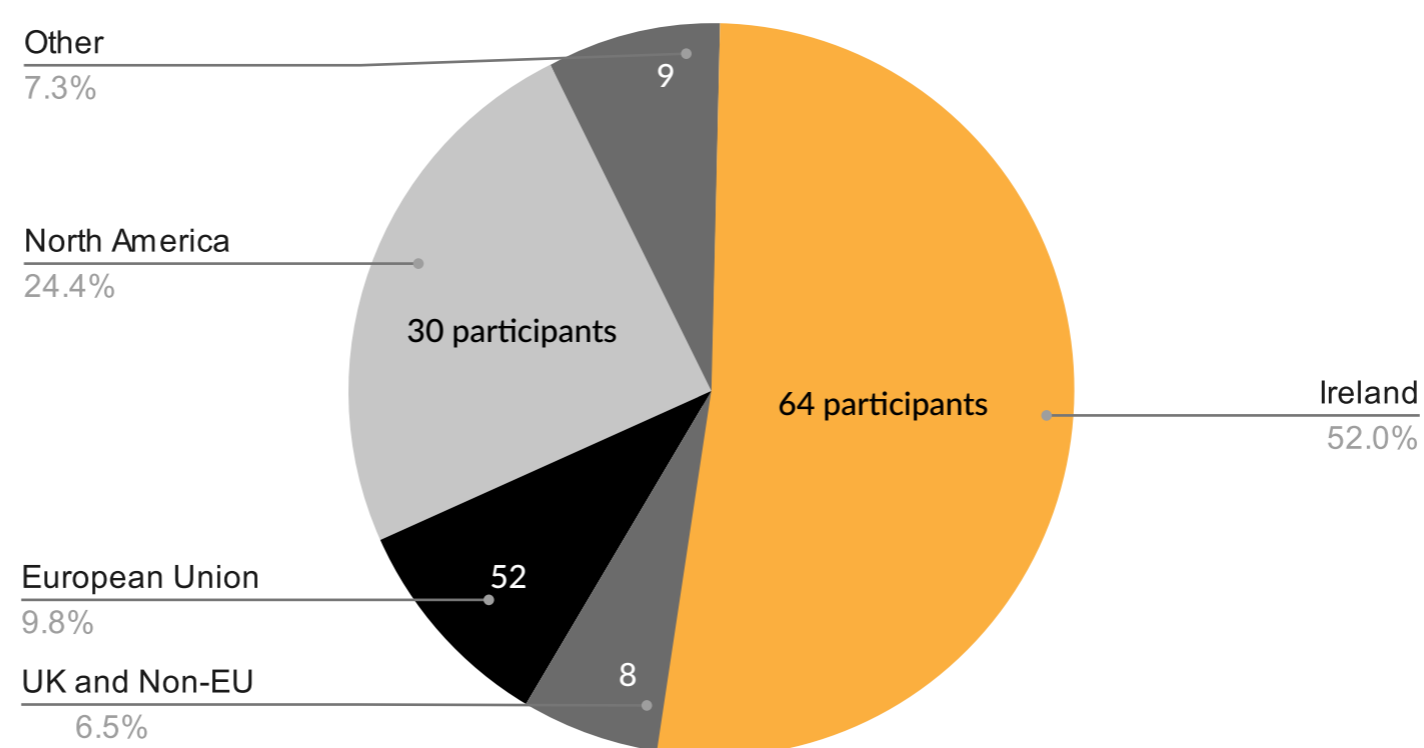64 participants

Ireland
52.0%

Fig 42. Survey results of the location of participants.

VISION IMPAIRED

To investigate the awareness, attitudes and acceptance level of the public towards vision augmentation technologies was related to their own vision impairment.

32% of all genders, and within the age group 18-49 only, participants do not have vision impairment.

68% of test participants have vision impairment.

Out of 40% of participants based in Ireland in the tested group, 66% are vision impaired, all genders, and both age groups.

The studies show that regardless of their own vision impairment, the awareness, attitudes and acceptance of vision augmentation technologies are various just like within the participants without vision impairment.

There is no significant difference between the participants with vision impairment and those who do not relate to it when comes to vision augmentation technologies, usage, timing, type, opinions, rating, willingness to try, etc.
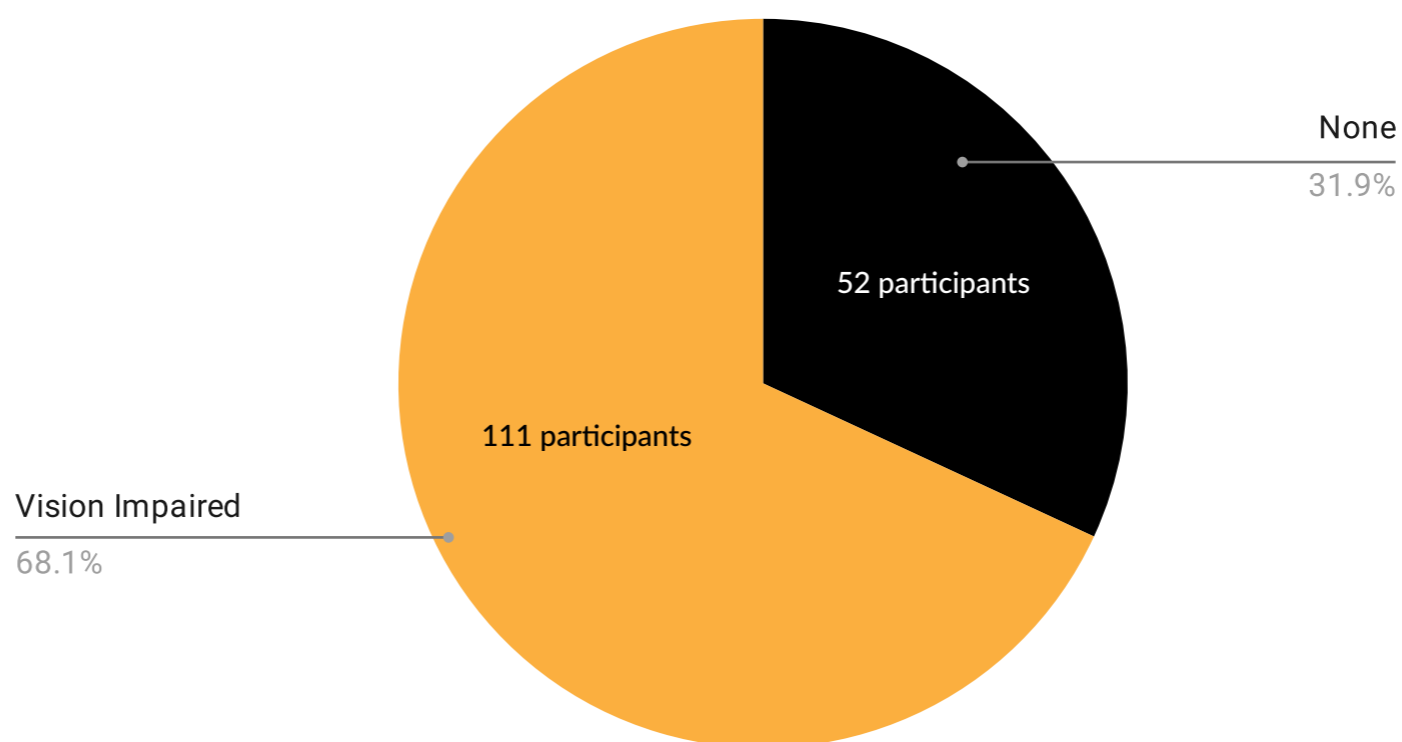
Vision Impaired

None
31.9%

52 participants

111 participants

Vision Impaired
68.1%

Fig 43. Survey results of the vision impaired versus none.

Vision Impaired

Blurriness
3.1%

Other
3.6%

None
26.8%

52 participants

Glasses/lenses
51.5%

100 participants

Floaters
5.2%

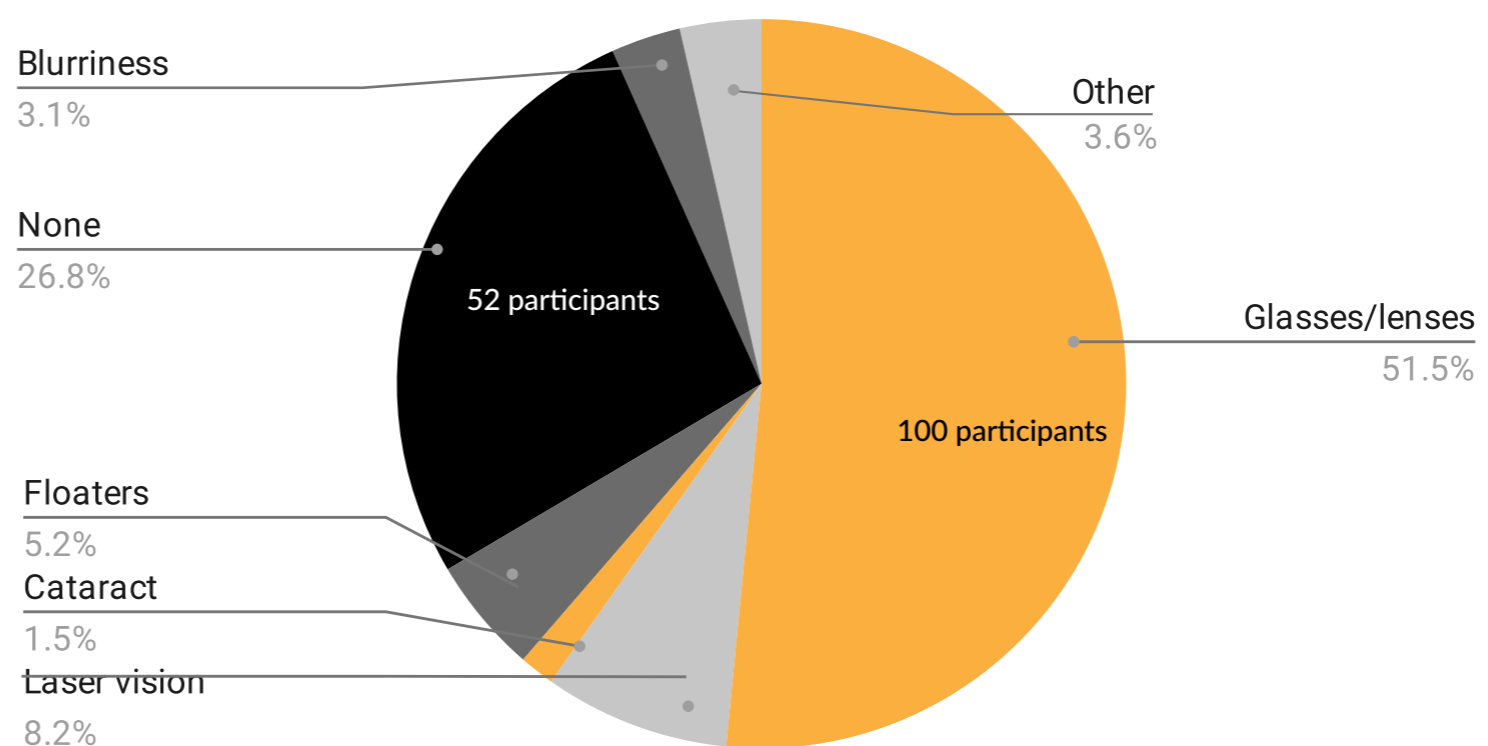Cataract
1.5%

Laser vision
8.2%

Fig 44. Survey results of the vision impaired, different types, versus none.

Vision Impaired in Ireland out of a total number of 163 participants

None
31.3%

20 participants
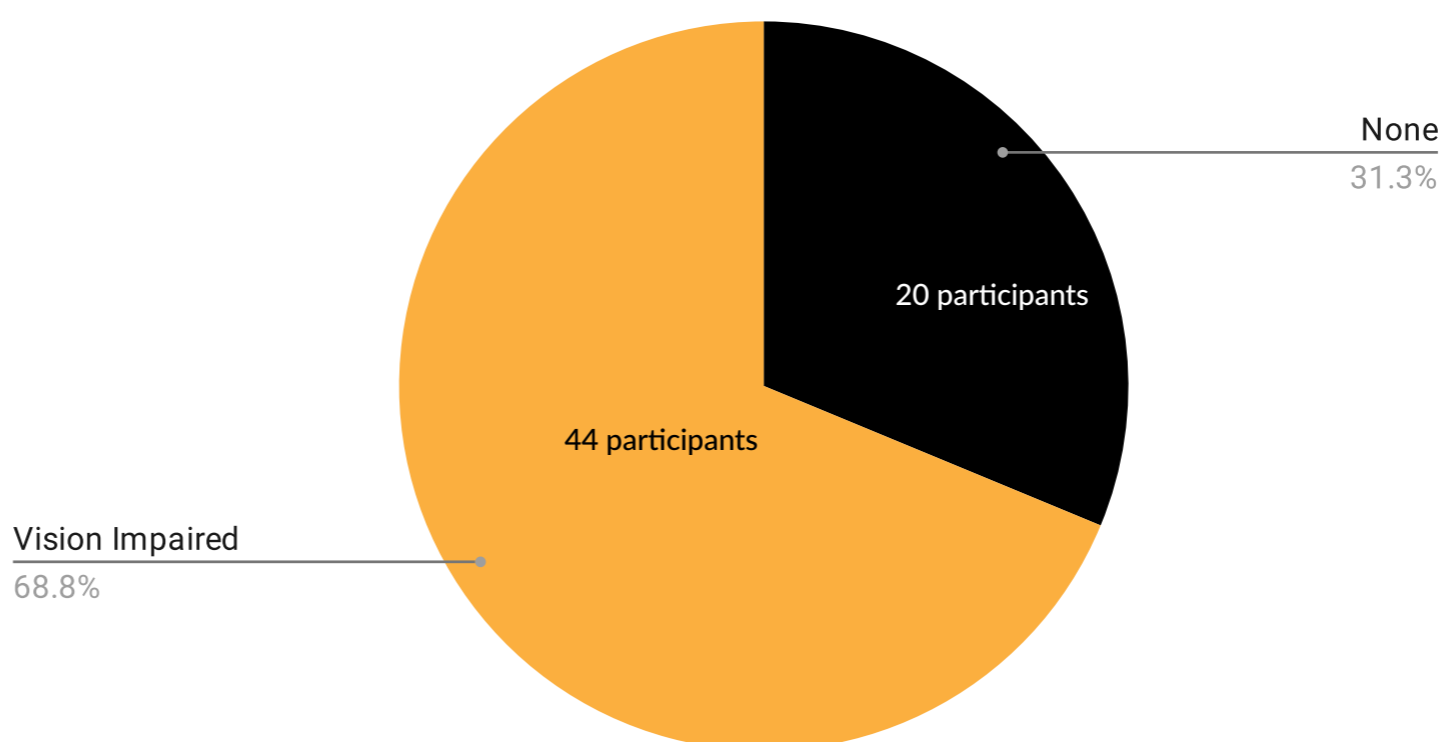
44 participants

Vision Impaired
68.8%

Fig 45. Survey results of the participants in Ireland.

VISION ASSISTIVE TECHNOLOGIES

Vision assistive technologies are well-known to the group representing the general public and almost equally known when comes to the type.

Of 81.6% who had encounters with vision assistive technologies, almost 40% are based in Ireland. But out of 18.4% who never had experience with or do not know what means Vision Assistive Technologies, more than 43% are also based in Ireland.

Almost 37% of people who never had an encounter with vision assistive technologies, do not have vision impairment themselves. They are all in one age group 18-49. All genders. All use professional and personal digital device screens within a different hours per day.

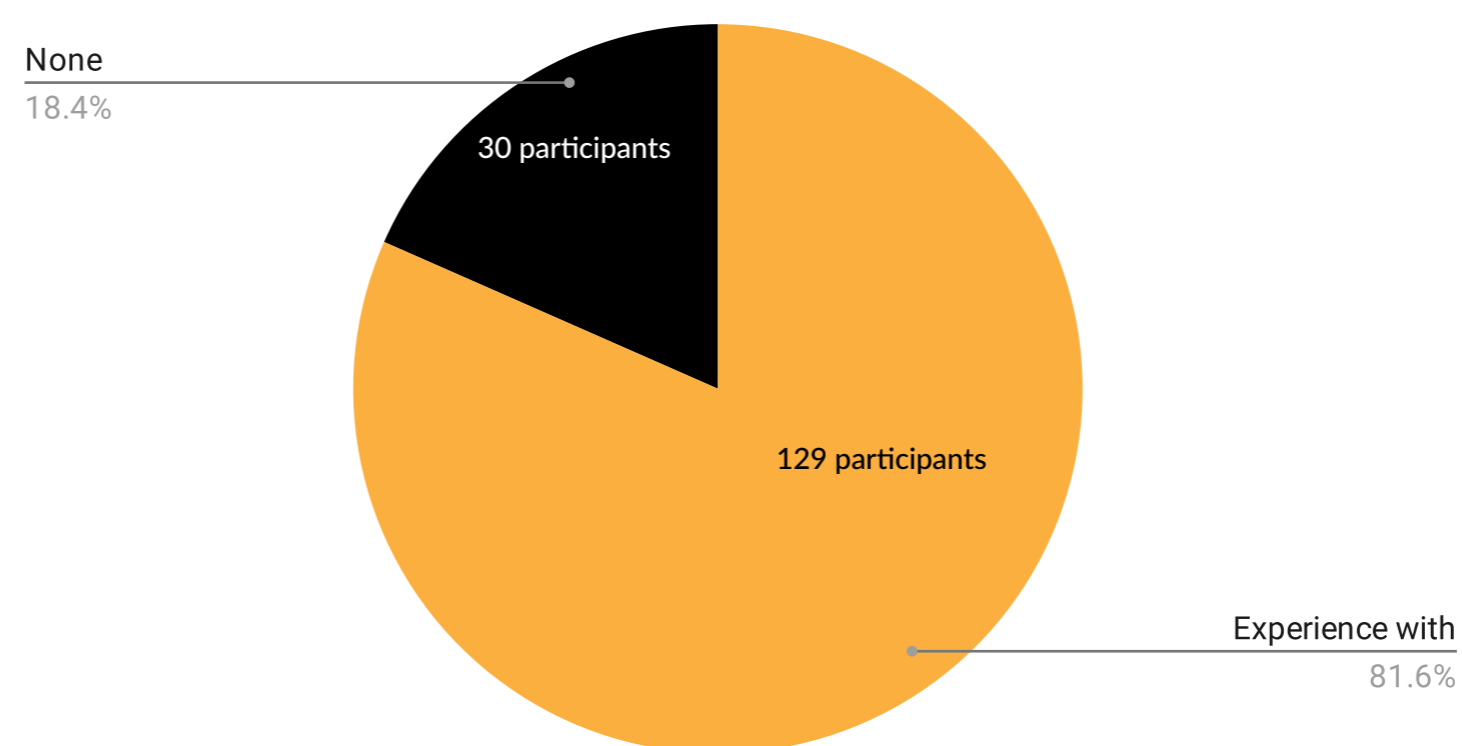### Vision Assistive Technologies Awareness amongst Public

Fig 46. Survey results of the global participants awareness of Vision Assitive Technologies.

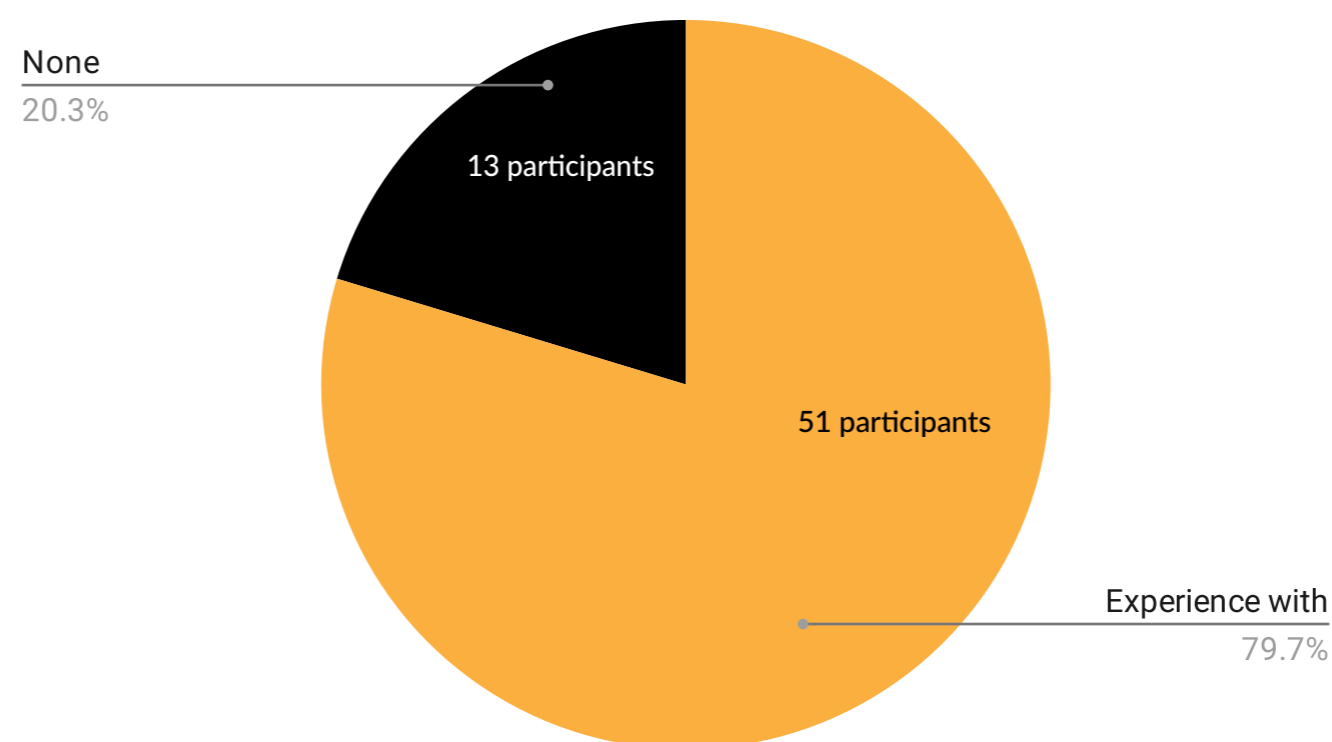### Vision Assistive Technologies Awareness in Ireland

Fig 47. Survey results of the participants in Ireland and their awareness of Vision Assitive Technologies.

COMPUTER VISION SYNDROME

33% of the participants of two age groups, and genders, do not experience any CVS symptoms, although almost 100% of them do use digital devices for personal and professional life within various hours per day.

However, in this group 80% of them, do wear corrective glasses and/or contact lenses. 20% of the participants of two age groups, and genders, do not experience any CVS symptoms, although almost 100% of them do use digital devices for a personal and professional life within various hours per day.

80% of them, do wear corrective glasses and/or contact lenses.

The collected data is unable to establish the link between any specific attitudes of participants and if the attitudes, behaviours, choices, and habits do cause CVS.
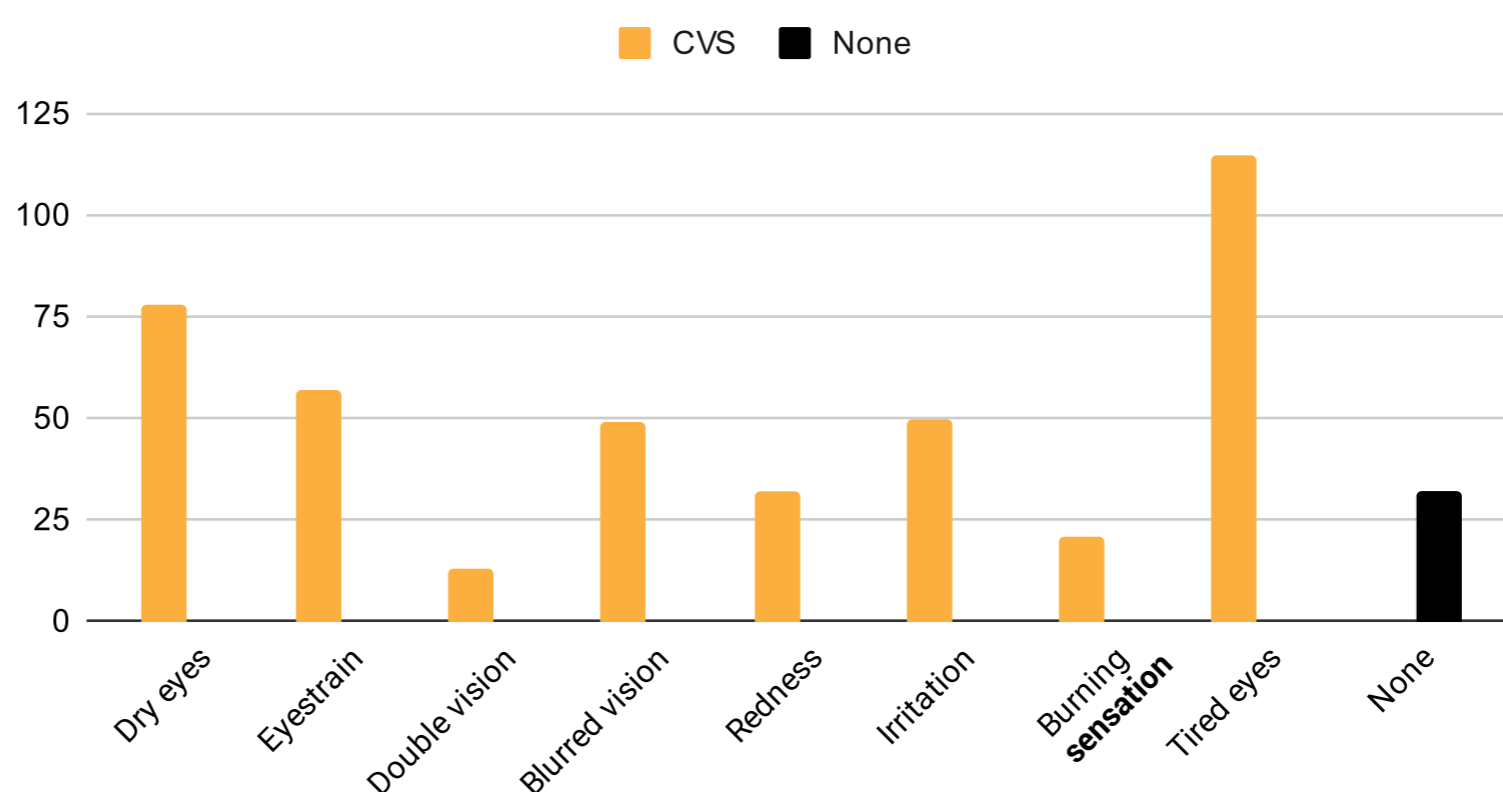
Computer Vision Syndrome

Fig 48. Survey results of the participants and their Computer Vision Syndrome types.

Fig 49. Survey results of the ratio between CVS to none across 163 participants.

SELF-HELP WITH SYMPTOMS WITH CVS

Participants who self-help with CVS symptoms and who do not use any above are in both age groups, all genders and different locations. Also, their time spent on digital screen devices is various. They do mostly use corrective glasses/contact lenses and as well not have any vision impairment. There are no significant other differences between those two groups.

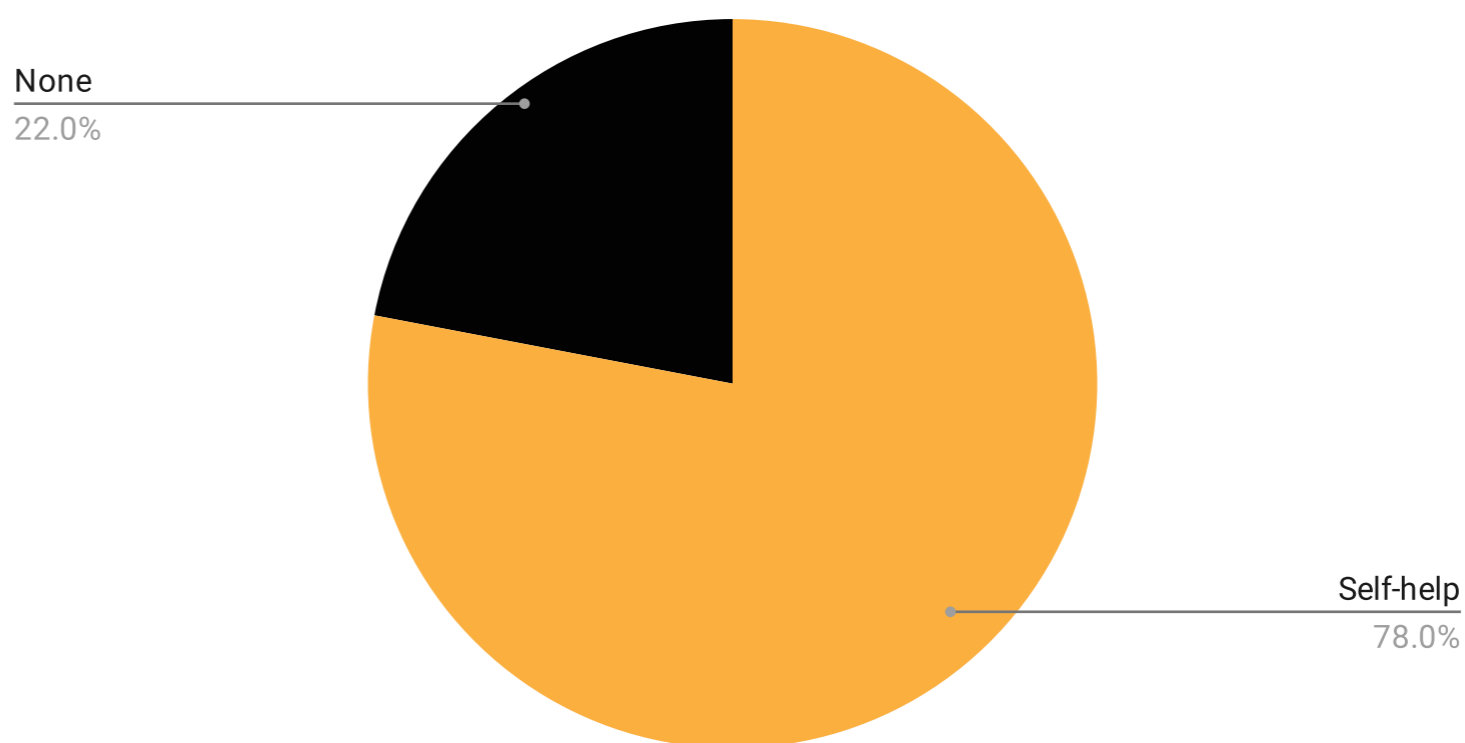## The CVS symptoms and the ratio between self-help and none

None
22.0%

Self-help
78.0%

Fig 50. Survey results of the ratio between self help and none help with CVS symptomes.

TIME SPEND ON WATCHING TELEVISION DAILY

Non-participant highlight above 12+ hours.

There are no significant other differences between those groups when comes to age, gender, location or usage digital secreen devices, VR and AR. Participants who do not watch TV also do have vision impairment and not have. They do experience CVS symptoms and do not.

Daily time spent on watching television

Not watching
9.2%
8+ hours
1.8%
5+ hours
1.8%
3-5hr
3.1%
2-3hr
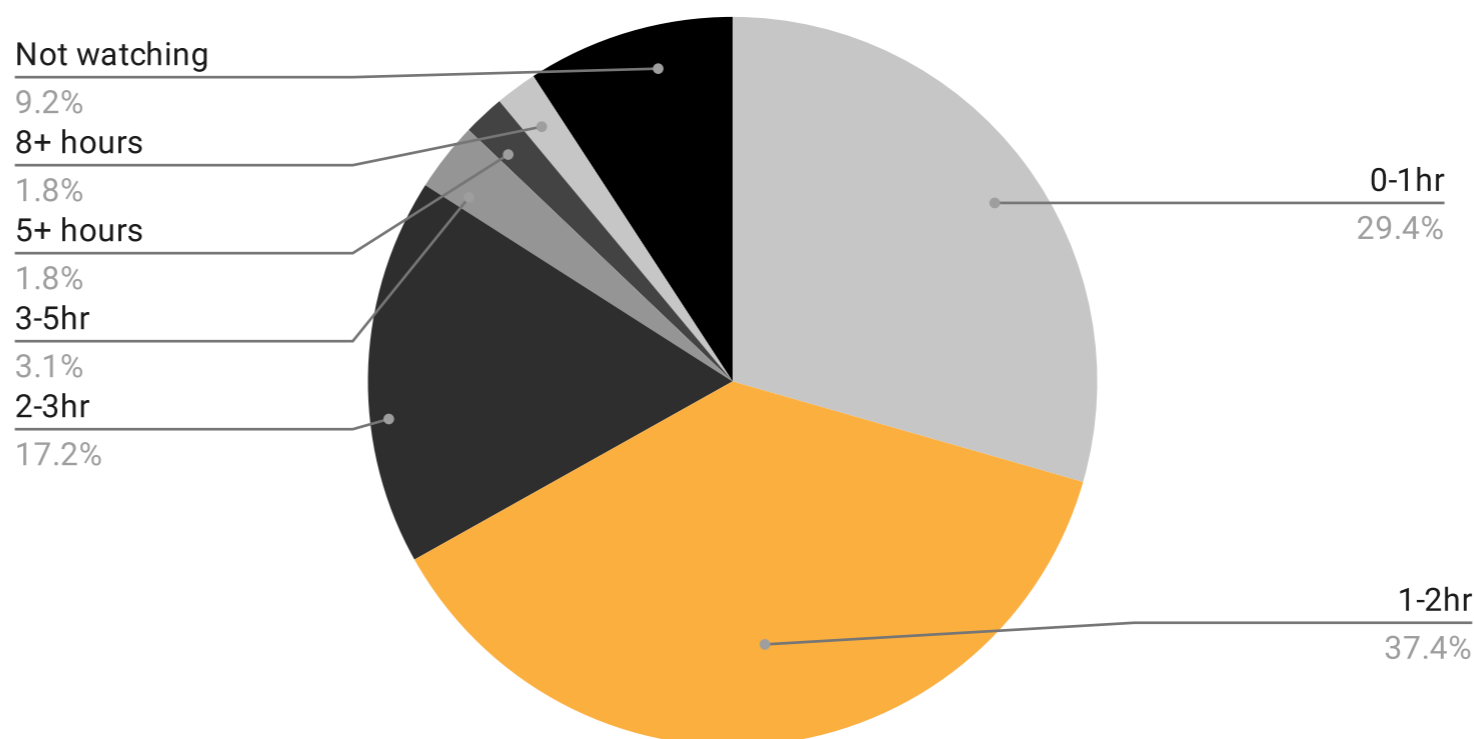17.2%

0-1hr
29.4%

1-2hr
37.4%

Fig 51. Survey results of the daily time spent on television.

DIGITAL SCREEN DEVICES PROFESSIONAL USAGE

97.5% of people in the tasted group use digital devices for work, school or college. The most popular devices are mobile phones and laptops.

Regardless of the time spent on the digital screen devices for professional life participants do have vision impairment in both age groups and genders or not.

The same with the symptoms of Computer Syndrome Vision. The collected data does not prove that the time on digital devices does impact vision impairment.

Daily usage of digital screen devices for work/college/school

12+ hours
4.3%

8+ hours
43.1%

1-2hrs
11.5%
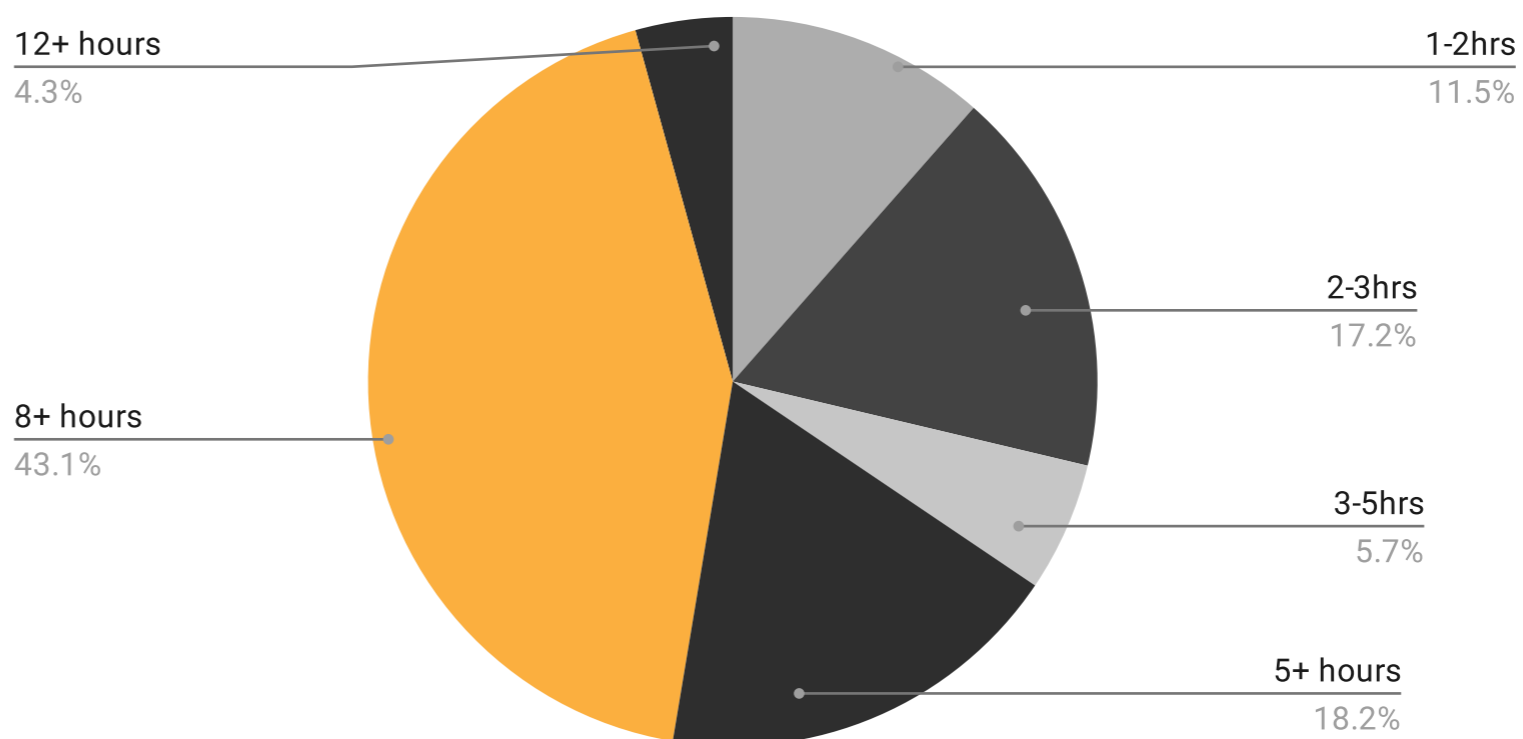
2-3hrs
17.2%

3-5hrs
5.7%

5+ hours
18.2%

Fig 52. Survey results of the daily time spent on digital devices for professional life (work, college, school).

DIGITAL SCREEN DEVICES PERSONAL USAGE

All participants use digital devices for their personal life. The most popular devices are mobile phones, laptops, followed by tablets, desktop computers and e-readers.

All participants in both age groups even with the smallest amount of time (0-2hrs daily) spent on the digital devices do experience CVS and/or have various vision impairment.

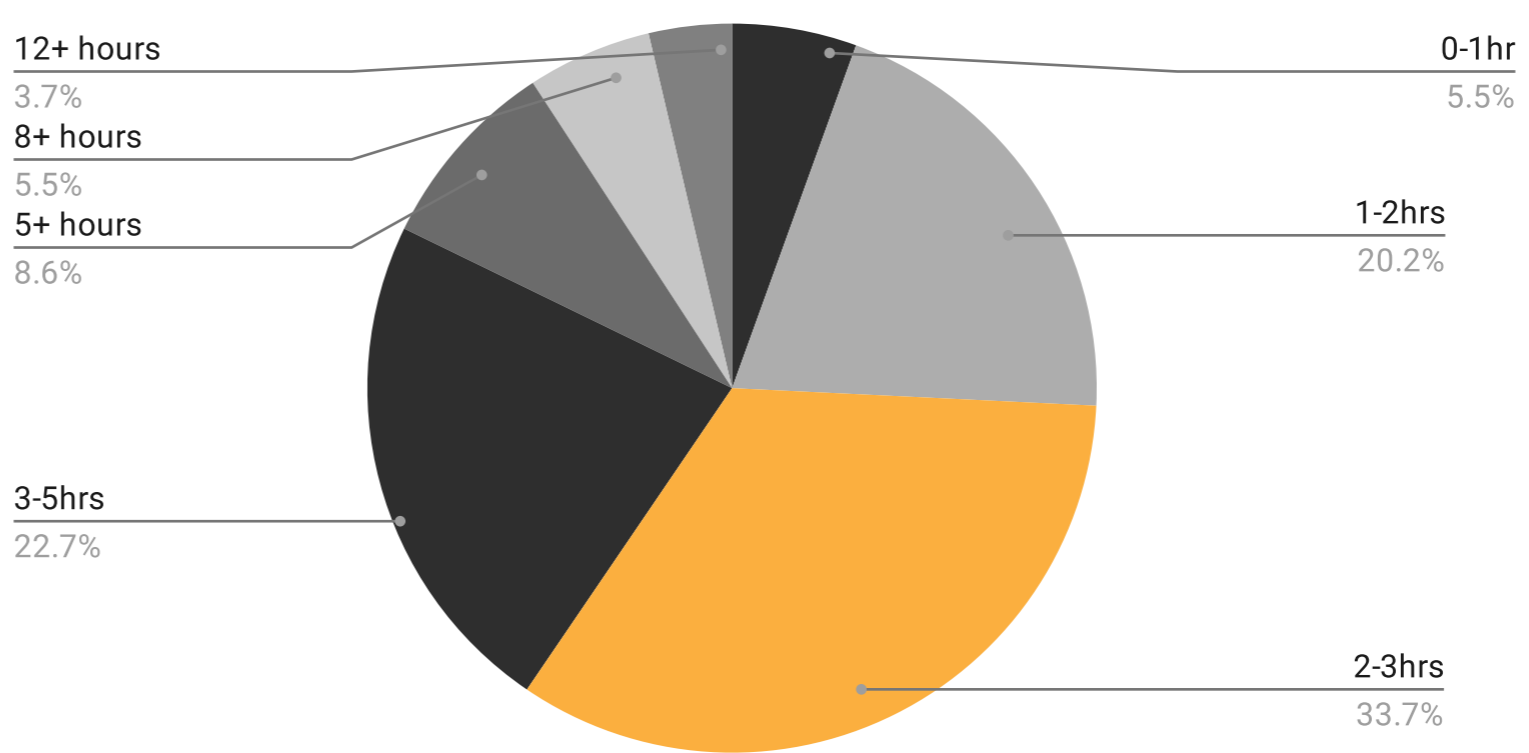## Daily usage of digital screen devices for personal use

Fig 53. Survey results of the daily time spent on digital devices for personal life.

DIGITAL SCREEN DEVICES USAGE IN AFTER BEING AWAKE AND BEFORE BEDTIME

54% of people from the tested group use digital devices after waking up and almost equally, 50% of those who use them in the morning, use them before going to sleep too as the last thing before going to the bed. Although, their daily usage for personal life varies similarly to use for professional life. But only 17% of those who use devices straight in the morning and before going to bed do not experience any CVS.

However, there is no association between using devices in the morning or before going to bed and experiencing CVS or vision impairment as even those who rarely use, once a month, or not at all also do experience CVS and have vision impairment in both age groups. The different time spends on it during the day is also various. Those participants are in both age groups, and all genders.

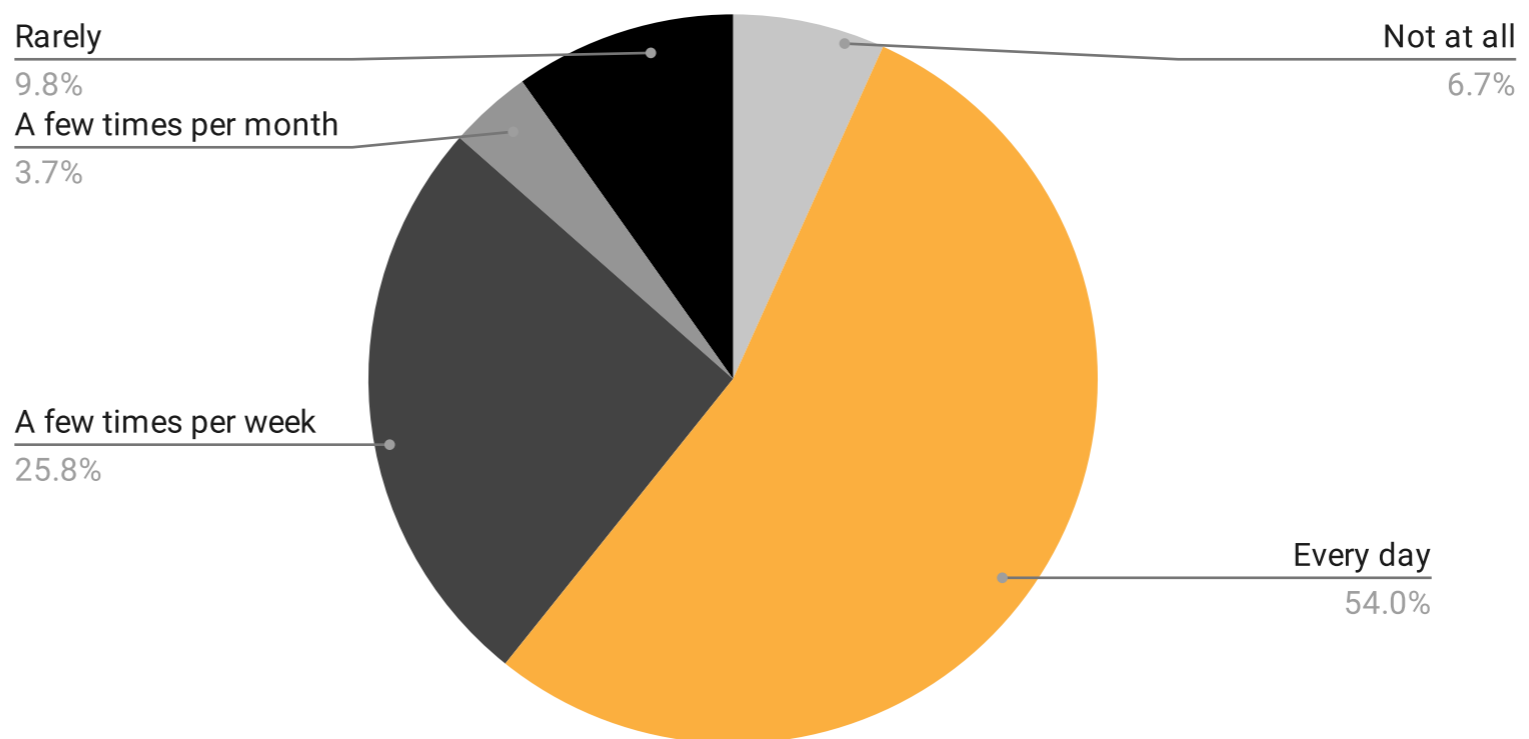## Use a screen device first thing in the morning after waking up

Fig 54. Survey results of the morning usage of digital screen devices as first thing in the morning.

Use a screen device last thing at night before going to sleep
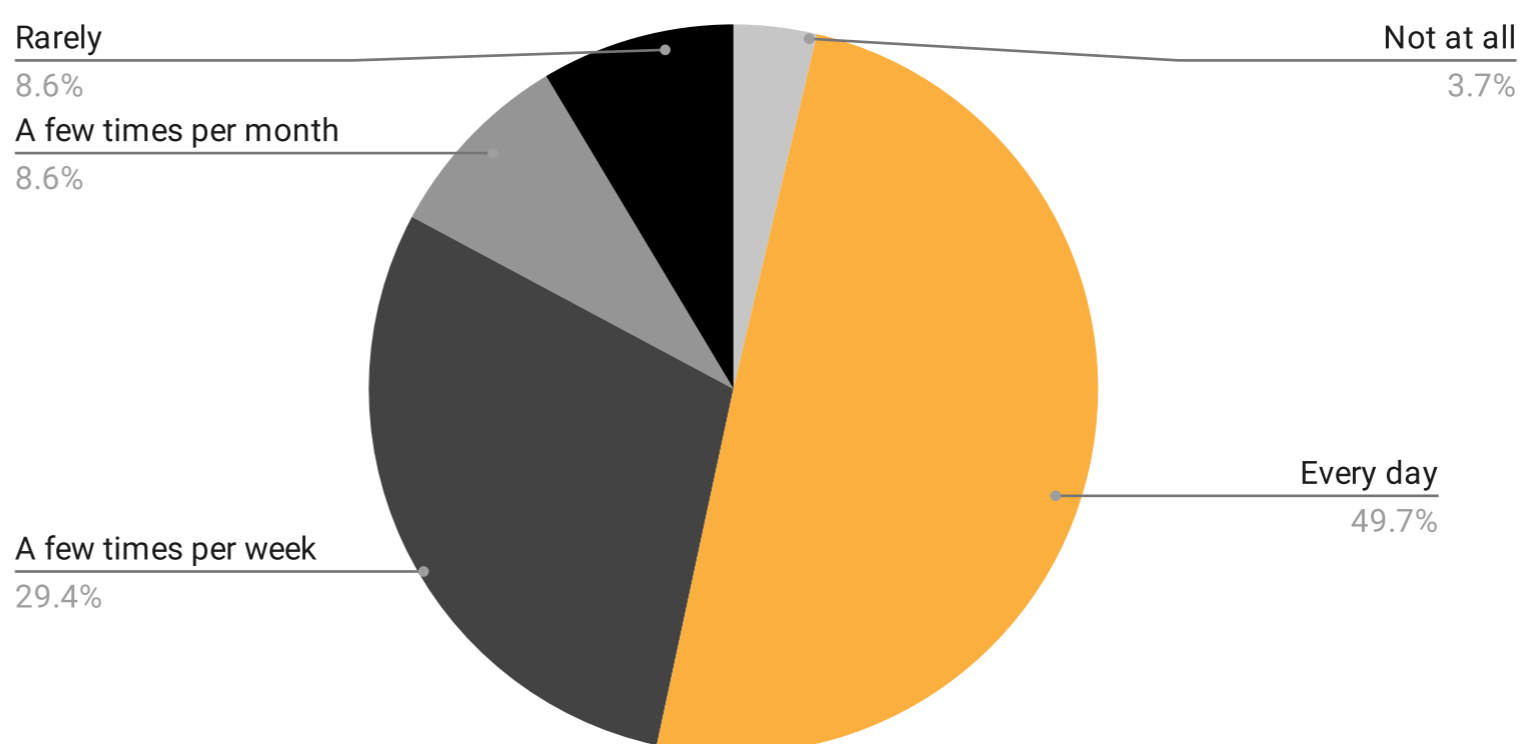

Fig 55. Survey results of the evening usage of digital screen devices before going to sleep.

VIRTUAL REALITY HEADSET

The VR headset is well known by the public, 88%. 78.5% of participants would try it (both age groups). 7% of those who do not know what is VR would also willing to try (both age groups). 16.5% do know what is VR and would not be willing to try (both age groups). Each of those groups does experience CVS or has vision impairment and do not have.

No connection can be established between the vision impaired and using VR at this stage.

56% of people tried a VR headset (someone else's demo VR headset at a shop/event) and from this group, 12% who did experience VR would not try it again.

Only 0.75% use VR headsets at work, college or school. 4.3% use it at home on average of 0-1h.

65% who tried it, didn't experience any of the eyesight or other e.g. marks, motion sickness, nausea, symptoms. 35% who tried it, did experience the eyesight symptoms and others during or after using a VR headset.

7% bought VR headsets as a gift mainly for adults. Only 11.7% knew that the VR headset is banned for children below 13 years old.

Virtual Reality headset awareness, attitudes and acceptance

Fig 56. Survey results of the VR headset awareness, attitudes and acceptance levels amongst the public.

VR headset overall experiences with it by users
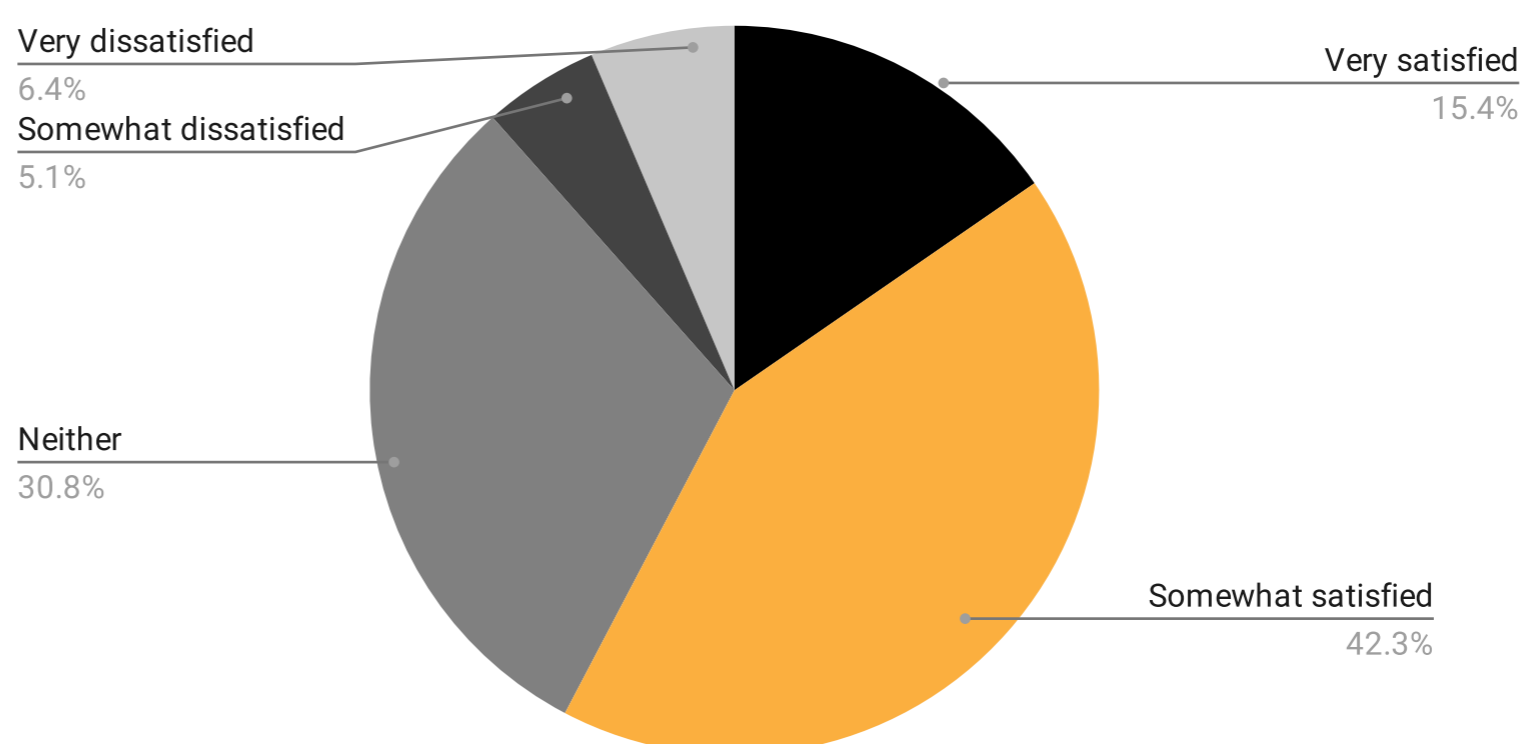
Fig 57. Survey results of the VR headset overall level of satisfaction by those who have own experience it by using it.

On a scale from 1 (the most negative - dislike it) to 5 (the most positive - like it),

the Average Rating is 3.20

Fig 58. Survey results of the VR headset overall level of feelings about it.

AUGMENTED REALITY GLASSES

The AR glasses are quite known by the public, 63% do know what is AR. 39% do not know, both age groups, and various locations. Each of those groups does experience CVS and/or has vision impairment and as do not. No findings can be established on provided data.

14% tried AR glasses (someone else's demo AR glasses at a shop/event). 86% never tried AR.

The only highlighted symptoms of dry eyes, eyestrain, double and blurred vision, discomfort, and pressure were experienced by 17% of participants from 14% of the total who tried AR glasses.

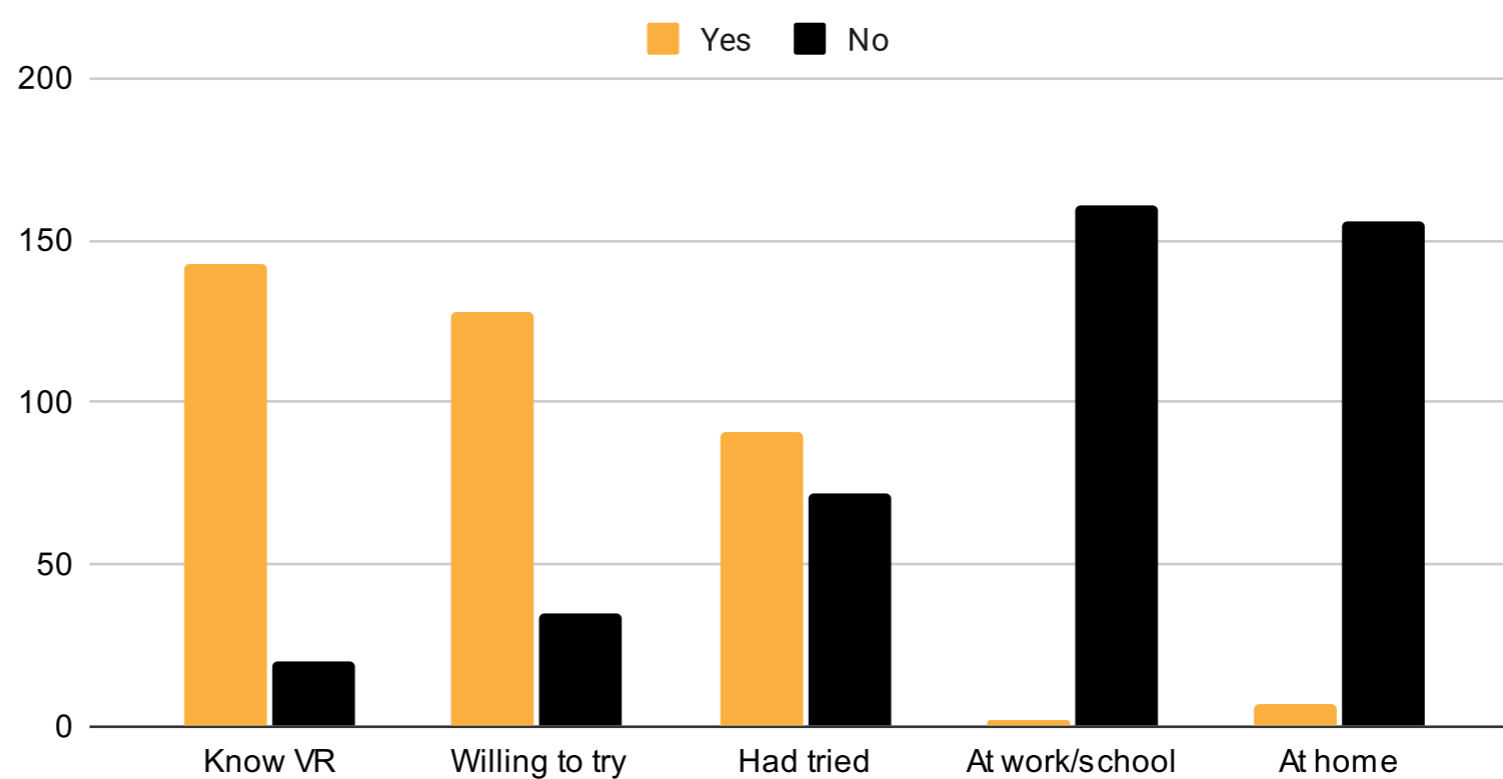## Augmented Reality glasses awareness, attitudes and acceptance
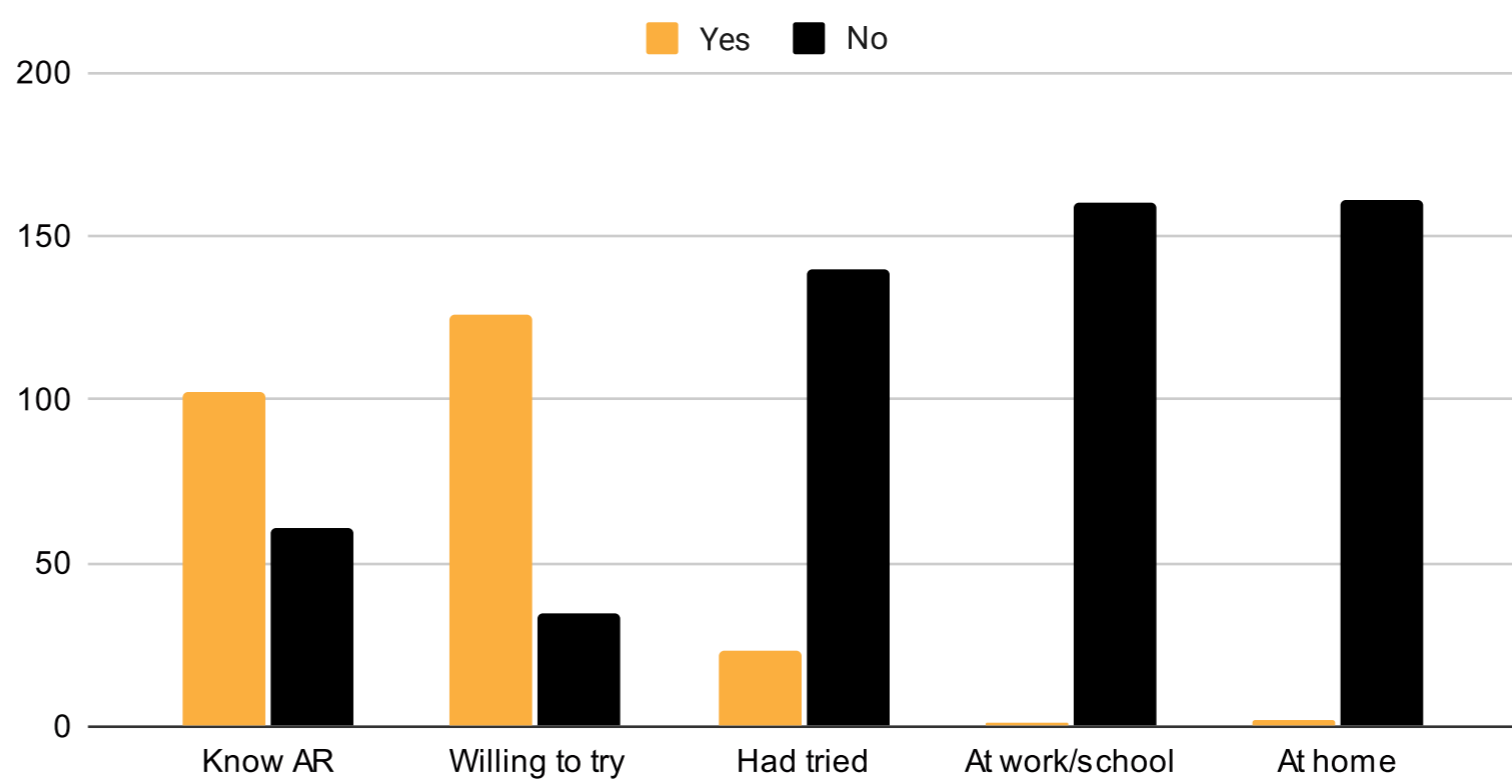
Fig 59. Survey results of the AR glasses awareness, attitudes and acceptance levels amongst the public.

AR glasses overall experience with it by users
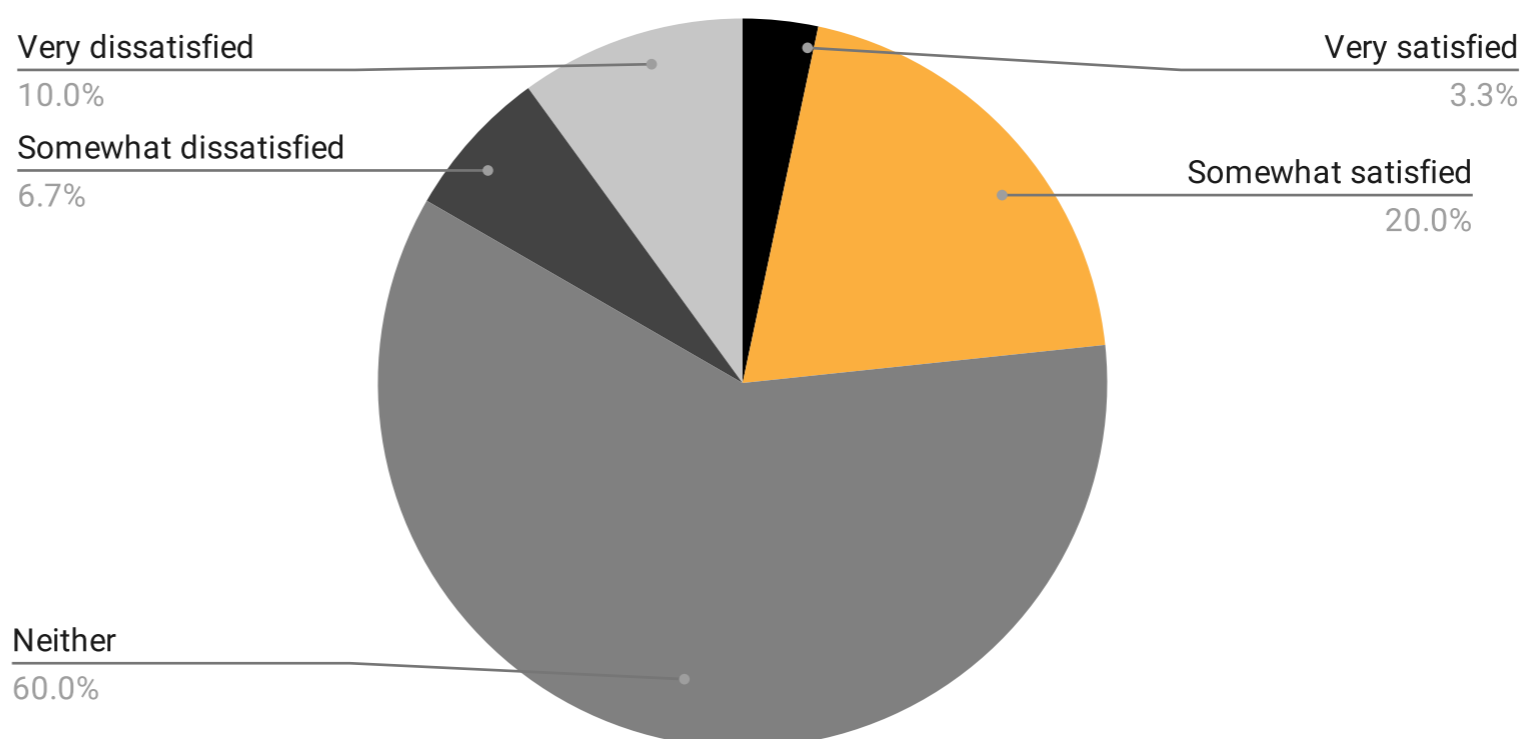
Fig 60. Survey results of the AR glasses overall level of satisfaction by those who have own experience it by using it.

On a scale from 1 (the most negative - dislike it) to 5 (the most positive - like it),

the Average Rating is 2.98

Fig 61. Survey results of the AR glasses overall level of feelings about it.

Being concerned about eyesight

No
53.5%

Yes
46.5%
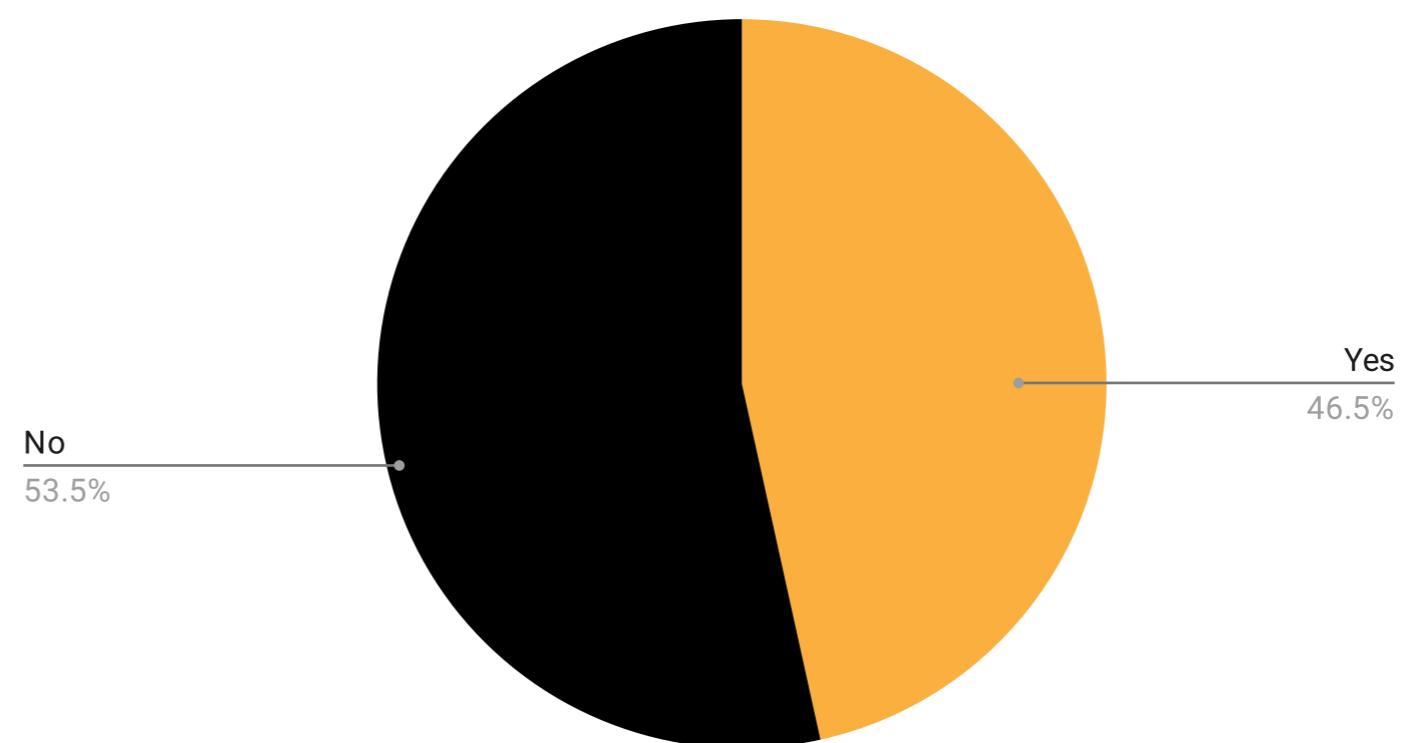
Fig 62. Survey results on being concerned about the eyesight and digital screen technologies, VR headsets, AR glasses etc.

Health and Safety Product Policies and Warnings read before using it by users

Yes
35.0%

No
65.0%

Fig 63. Survey results on reading the health and safety product policies and warnings before using VR or AR.

CONSLUSION

The collected data shows that the public has various awareness, attitudes and acceptance levels in terms of digital screen devices, amount of time and usage for their personal life. However, more than half of the tested participants do use digital devices straight after being awake and before going to sleep.
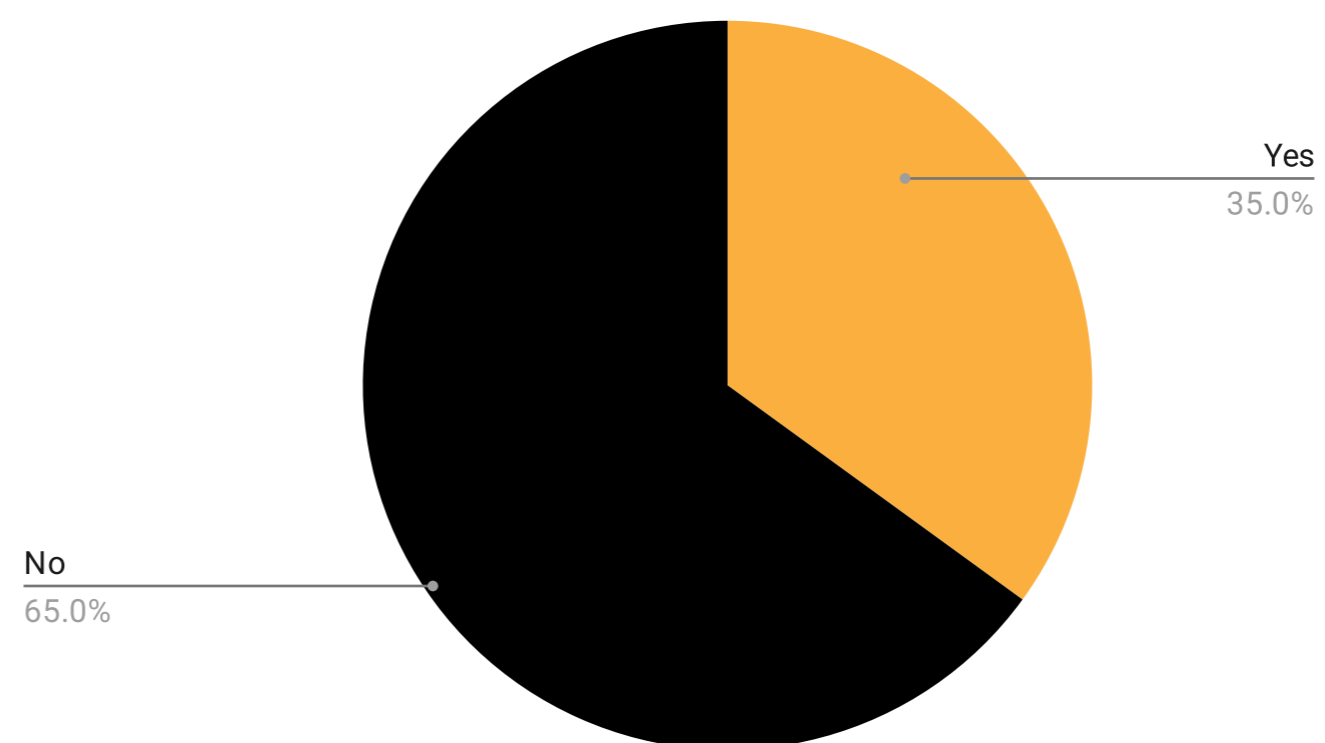
Furthermore, analysis shows that 62% of participants do use corrective glasses, and contact lenses, and had or plan to have laser vision correction. This number represents both age groups, genders, locations and various times of digital devices for personal and professional causes and watching or not TV. Within this group, 11-12% do not experience any Computer Vision Syndrome of both age groups or gender located across the globe. 51% of tested people do experience CVS.

The initial solution product proposal will be dedicated to the entire public and of course, those who like to use it to observe their awareness, attitude and acceptance levels of vision augmentation technologies in relation to daily usage in terms of time, amount, time of the day, and night.

The aim of the product will be to track the amount of time spent online and/or on TV. As well as to track early morning and before going to sleep usage to over any relationship between the sense of vision in their own daily life.

The public would be able to observe their own relationships with digital screen devices, such as computer desktops, mobile phones, tablets, e-readers, laptops, TV, VR headsets, AR glasses and vision impairment and Computer Syndrome Vision, their own and relatives in the household.

The public studies discovered a lack of reading of VR/AR Health and Safety policies and warnings and a lack of awareness of banning products for children below 13 years old. The research itself already brought a perspective on this to those participants, who hadn't been aware of it.

The ratio of participants' concern about their sense of vision and usage of vision augmentation technologies does prove that the public would be interested in the solution product proposal, which will be described in more detail in the following section of this project.

5.5% of participants used digital screen devices for professional needs for more than 12 hours, but 55% more than 8 hours plus personal time, which varies to individuals when taking Tv into account and the rest of digital screen devices.

The data of the survey cannot make at this point synthesis that the digital screen devices do impact the eyesight as the larger amount of users, and the placebo group should be taken into account.

However, data shows important results that more than 61% of participants spent 1/3 of their daily usage on digital screen devices for purpose of professional life. In addition to using devices for personal life.

Additionally, 24% of participants spent more than 5 hours for work, school or college on screen devices and between 1-12 hours for personal, every day and/or a few times per week.

This gives a good foundation to establish personas and the solution design products proposal which will help with the aspects of awareness, attitudes and acceptance.

The following research stages of this design process will contribute even more to overall insights on this topic.

SOLUTION
PRODUCTS
PROPOSAL & TESTING

PERSONA
POTENTIAL USERS

The Persona is a character which represents the potential user based on the collected insights. There might be one or more personas for each case study. The Persona allows one to understand the target audience's motivations better, helps achieve their goals and needs, and erases frustrations.

The Personas proposed for this research study are based on the results insights of the primary research methods and collected data.

John spends daily approx 8-12+ hours on:

John's BIO

John had laser vision correction 20 years ago and use the iteration, tired eyes relief eye drops.

John O'Brian

Age: 49

Gender: Male

Place: Dublin, Ireland

Job: 9-5, Senior Manager

Vision Augmented Technologies
Professional Life
John is working in the Revenue office as a Senior Manager from 9 am to 5 pm in Dublin city centre. Almost every day he spends extra 1-2 hours of overtime to cover his latest absence due to upgrading his qualification in Payroll. He works mainly at the computer but uses a laptop to complete his homework for his college in the evenings at home. He also studies remotely online most weekends.

Personal Life
He watches TV 1-3 most days before going to sleep. He has a tendency to wake up and use a mobile device as the first thing to do. On average he spends daily 8-12+ hours using vision augmentation technology for desire, entrainment, job and studies relative tasks.

Vision Assistive Technologies
He used to wear glasses when he was younger in his 20s. Then had a laser correction around the '30s. For the last few years he back to corrective glasses. He experiences Computer Vision Syndrom from time to time. Sometimes uses eyedrops to prevent red eyes.

He has experience with assistive technologies. He has seen in his lifetime vision-impaired persons using a white cane or walking with a guide dog at his workplace. He is aware of Braille's language, larger print materials, text-to-speech screen devices, and W3C. His eyes are checked regularly due to health and safety policies at his work.

FRUSTRATIONS

1. First thing in the morning - mobile. My wife does the same. It is really frustrating.

2. I sometimes eat lunch at the desk when I am busy.

3. I know I spend a lot of time on digital screen devices at work, for studies and for personal stuff.

4. I have so little time for myself and for my wife to spend time doing something valuable so we watch TV or spend time online holding laptops on our knees.

5. My eyes are getting red sometimes due to the amount of time spent on screens. Eye drops help a bit.

6. I am frustrated as I do not really know what can I do with it. I feel lost.

MOTIVATIONS

1. I really motivated to start using again the old-school alarm clock. I miss it. It is cool.

2. I am motivated to go to my college more often to study in the classroom instead of remotely.

3. I want to be more healthy and spend more physical activities outdoors or play board games, instead of using the internet or TV at home so much.

4. I will be motivated to do some volunteering with vision-impaired people.

GOALS

1. My goal is to stop using the mobile device as an alarm.

2. To reduce overall internet and TV usage on daily basis.

3. My goal is to establish better daily and weekly habits and to have healthy eyesight.

4. Furthermore I want to learn and understand more about assistive technologies as I do interact at work with vision-impaired people from time to time.

Lucy Smith

Age: 55

Gender: Female

Place: Cork, Ireland

Job: 8-6, PR Manager

Lucy spends daily approx 8-15+ hours on:

Lucy's BIO

Lucy uses corrective glasses to read and adapt to the light in the office when her eyes get tired.

Vision Augmented Technologies

Professional Life
She works in a medium size company and uses a laptop and a tablet to present colleagues with the data collection. She works most days for more than 8 hours even up to 12 hours. She is also available on the smartphone due to the latest company updates and notifications on social media, which she is responsible for.

Personal Life
She uses digital screen devices for personal use on average 2-3 hours daily especially at the Luas during her commute to work. Together with her partner, she uses a VR headset for approx hours almost every other day. Both experienced skin marks, itchy eyes, nausea and a headache. None read the H&S policies and warnings before using the product. She reads e-books on an e-reader to avoid waking up her partner, although she prefers hard-copy paper books. She checks the latest email, social media, and news approx 15-30 minutes before falling asleep.

Vision Assistive Technologies
She uses contact lenses most of her adult life. She doesn't have direct contact with other vision assistive technologies for vision-impaired people except those who wear glasses.

FRUSTRATIONS

1. When I cannot sleep, I scroll the social media and news on my mobile device for hours.

2. I used to like to read paper books but my partner couldn't fall asleep so I get an e-reader.

3. We got VR headsets and we were so excited to use them that we forgot to read the policies. Nothing serious happens but my eyes were itchy, got skin marks, a headache and nausea.

4. I work in front of a computer and I take the laptop to finish at home. I often use mobile devices and tablets.

5. My eyes get dry more often.

6. I am frustrated that I don't even take regular breaks at work.

7. I spent too much time in front of the screen and it is worry me a bit.

MOTIVATIONS

1. I am motivated to find a better way to use the internet than endless scrolling.

2. I am motivated to fall asleep without a mobile.

3. I want to know how much time do I spend on digital devices and VR headsets weekly.

4. I want to join lunch with my colleagues more often to take get to know them better and rest.

GOALS

1. My goal is to support my sense of vision as I am getting older.

2. My goal will be to be more aware of my attitude towards vision augmentation technologies.

3. To be aware at work and in my life of how much time I really spend on digital screen devices.

SOLUTION PRODUCTS
DESIGN PROPOSAL

The survey results and insights were essential to understand the challenges that the public has when comes to vision augmentation technologies in their professional and personal life while at the same being conscious about the sense of vision and corresponding connection within.

Based on the conclusion based on the findings, the initial two solution products design proposal were created.

The Eyes' Diary and Pixel Tracker can be as well be used in form of PDF for those who prefer its online version. PDF can easily open in any program.

The proposed personas with the potential frustrations, motives and goals, helped to establish a simple, manageable and easy-to-use daily diary to track the amount of time spent online as an MVP1.

As MVP1, the products are in form of simple sheets, which can be printed to have an analogue version to minimise the usage of digital devices and exposition to the screen by mobilising the public to do other types of activities than online by handwriting and doodling.

The establishment of new habits comes with time, that's why both versions are given to emphasise users' needs and wants.

Furthermore, the solution design in the future can in MVP2 have a form online mobile and desktop app with much more advanced features, connected functionality within the calendar, and gentle or up to the user more direct reminders of the amount of time spent online with personalisation and optimization settings to meet individual needs.

However, now the aim is to step out from online devices and create something that can help immediately and be different to the range of apps available.

Both products can be given to the public free of charge by a health sector and GP, in form of a gift by HR by employers, or with a small donation to eyesight charities.

Furthermore can have more information about the sense of vision, and wellness but the initial product, for now, to be tested is a simple chart to track time. Additional information can come with time.

Start small with changes to receive big results.

A - The Pixel Tracker

Track Your Time spend on digital screen devices by Colourful Pixels. Each pixel is one day.

It is a one-page easily visible tracking designed to track 365 days, monthly and yearly tracker.

It can be in form A4 or A3 or larger.

Users can use colourful markers and/or pencils to establish their own legends by deciding which colour is for what range of time of using digital screen devices.

For example, 0-3 hours is green and red is dedicated to more than 15+ hours. Yellow for range from 3-5hours and so on.

Additionally, they can add the capital first letter of the type of device (e.g. M for Mobile) and a triangle for professional use with W for work, S for School and a circle for personal use.

It is easy to use the tracker. It is super transparent, it shows easily how much time is spent daily on digital screen devices. It can be displayed in the office, in front of the desk and at home in various rooms where users do use devices, eg. in the bedroom, in the living room and home office.

B - The Eyes' Diary - I, EYE

Track Your Time spend on digital screen devices by making notes each day, and seeing progress by establishing your own values, goals and motives.

See clearly your frustrations and reward yourself each time when you achieve your goals.

Each day has two pages to write notes to track usage for personal and professional needs. At the end of each week is the page to make simple calculations, reflect on them and establish the next steps.

It is a multi-page easy to maintain a simple diary with additional pages to make notes, write stories, and doodle.

It can be in form A5 or larger.

PRODUCT A
THE PIXEL TRACKER

Version 1 is to be iterated and slightly improved after receiving feedback from the participant, supervisor and practical testing:

Add little guidelines, and visual examples on how to use it/how it looks when filled in:

Use bright markers or get stickers (adding stickers, and markers as a set altogether).

Explain that the highlighting type of digital screen device is optional and only choose the main one 1-2 per day. Example M for mobile and L for Laptop.

Add the full name of the digital screen devices next to the icons and in the bracket the initial letter. Example: Mobile (M).

Highlighting shapes, triangles and circle is personal and professional usage is optional.

Version 2 will be based on feedback. More testing needs to be done to approve the final design product.

This 365 Pixel Tracker will help you with tracking the amount of time spent on digital screen devices to help your eyes rest anytime you need and want. Small Changes, Big Results! Enjoy and have fun with this personal journal. Your Eyes will be grateful for it!

I, EYE

The Pixel Tracker

small CHANGES
big RESULTS

Track Your Time
by Colourful Pixel

Legend
Decide the colours for amount of hours spent on devices. Use colourful markers or pencils.

0-1 hour	TV
1-2 hours	M
2-4 hours	L
4-8 hours	D
8-10 hours	T
10-12 hours	E
12-14 hours	VR
14+ hours	AR

▲ Professional Use
W - Work
S - School/College

● Personal Use

More products at www.hasnik.com

months days	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
6												
7												
8												
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31												

PRODUCT B
THE EYES' DIARY - I, EYE

Version 1 is to be iterated and slightly improved after receiving feedback from the participant, supervisor and practical testing.

Version 2 will be based on feedback. More testing needs to be done to approve the final design product.

Front Cover

Dedicated to your precious eyes
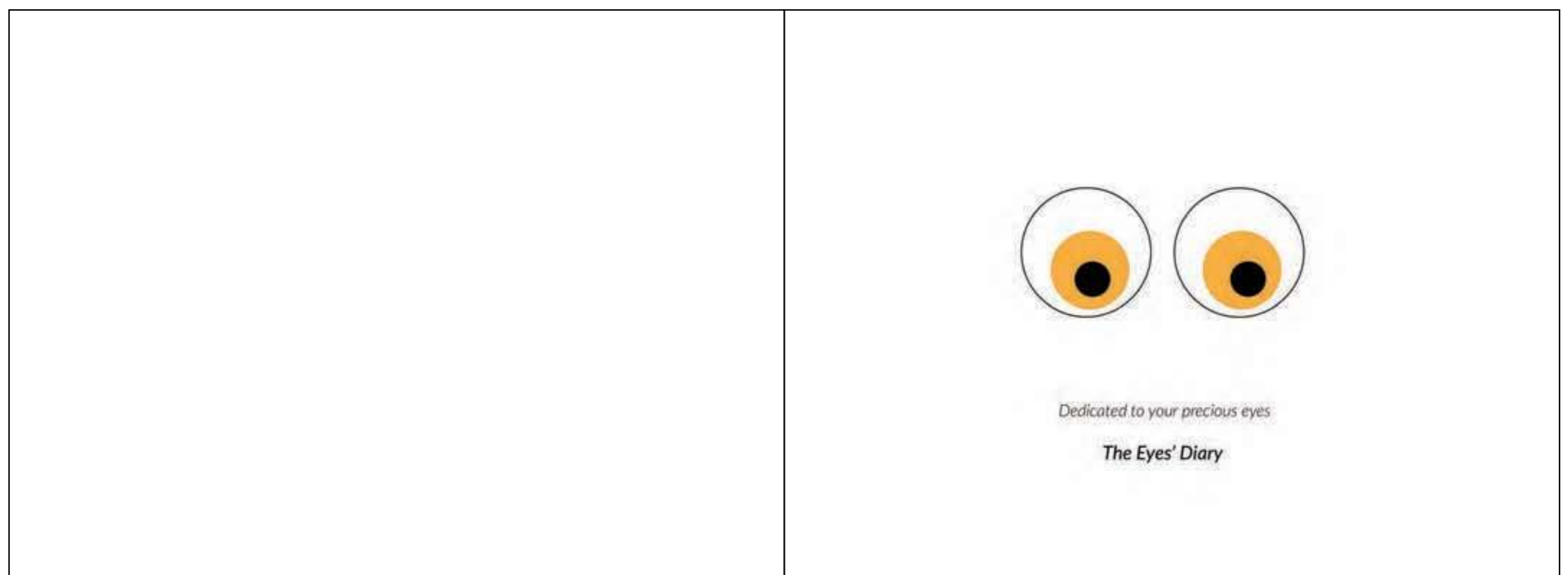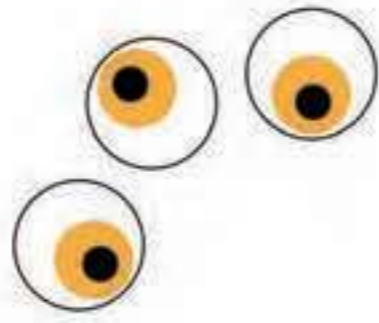
The Eyes' Diary

I, EYE

The Eyes' Diary

This Diary will help you with tracking the amount of time spent on digital screen devices to help your eyes rest anytime you need and want. Small Changes, Big Results! Enjoy and have fun with this personal journal. Your Eyes will be grateful for it!

Place here Your photo
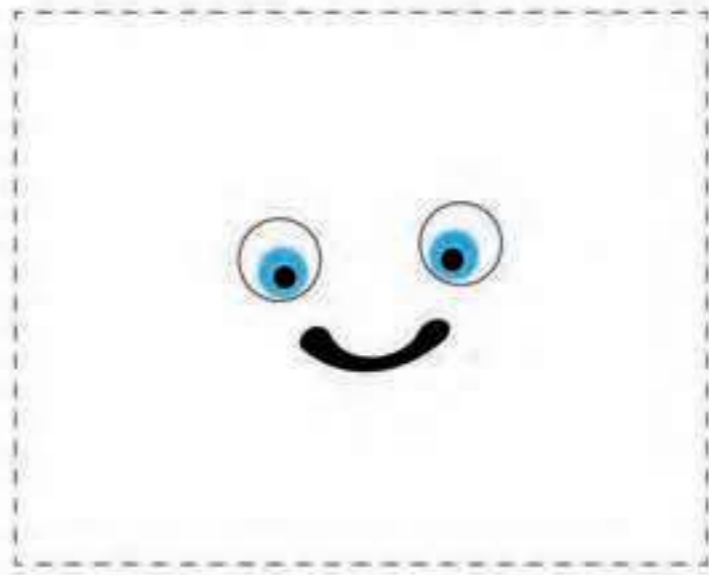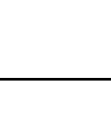
Your details

Full Name	....
Age	....
Phone Number	....
Email	....
Address	....
Profession	....
Hobbies	....
Others	....

What my eyes...

do on each device?

How much time
on devices
until become crime
for my eyes?
Because they become literally a dime
This is not a grime
but I need to get a herbal thyme
to properly let them rest
and do scroll less
No more social media mess...
Let's play chess.
On the real board.
Btw, you really look good in this dress!
Thank you, Ches.
You are welcome my Bess.
What this is so tasty cress.
You eat a lot, leave a bit for Tess.
Hey, this is called forest.
Yes! Yes!
I feel alive.
I feel like I came out of the mine.
I have to get over this online stress.
I can do this change.
It is in my range.
Be my own lord.
Oh yeah, the bless!

	TV	....
	Mobile phone	....
	Laptop	....
	Desktop computer	....
	Tablet	....
	E-reader	....
	VR headset	....
	AR glasses	....

My Eyes are the colour of...

My relatives' eyes are the colour of...

highlight, write or draw and have a fun

		My eyes	My relatives' eyes
	BROWN		
	BLUE		
	GREEN		
	AMBER		
	GREY		
	HAZEL		

My eyesight is...

My relatives' eyesight is...

example category		My eyesight	My relatives' eyesight
	Corrective Glasses		

I, EYE
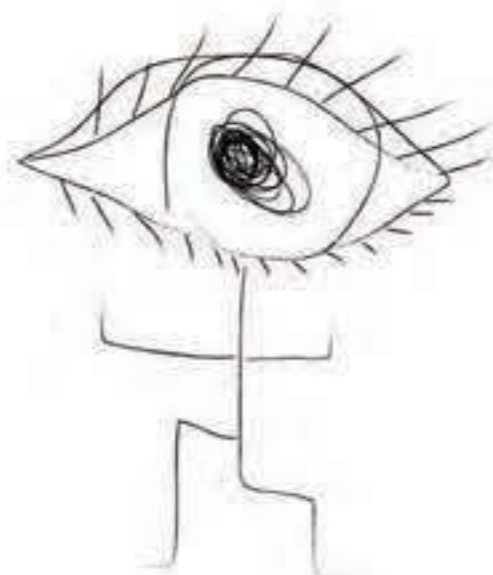
Doodle or Write a Poem

about Your Eyes
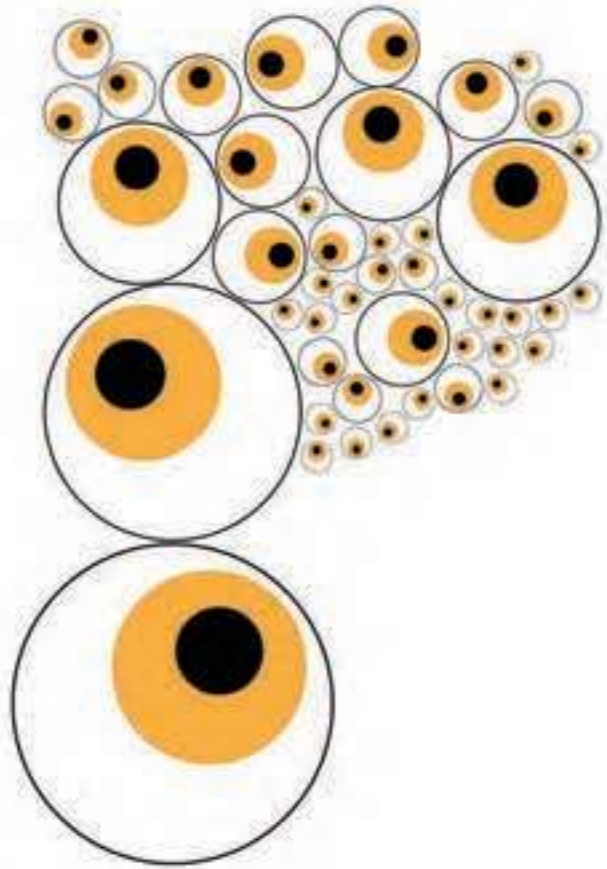
This is my place

For my eyes' story
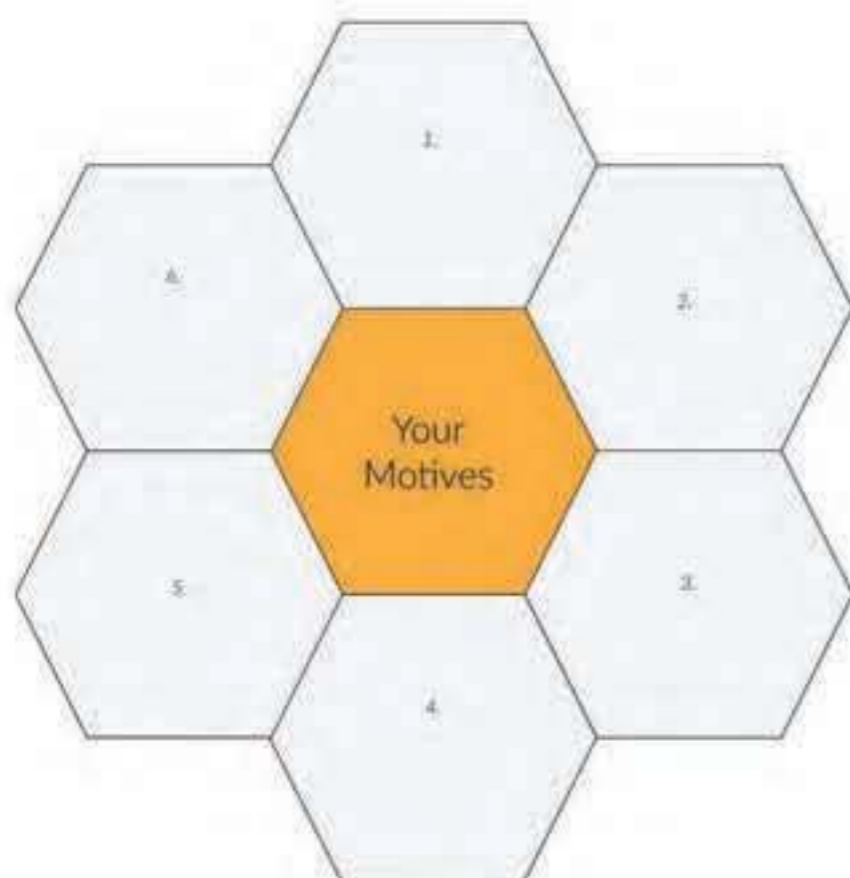
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Your Frustrations

Your Values

Your Motives

Your Goals

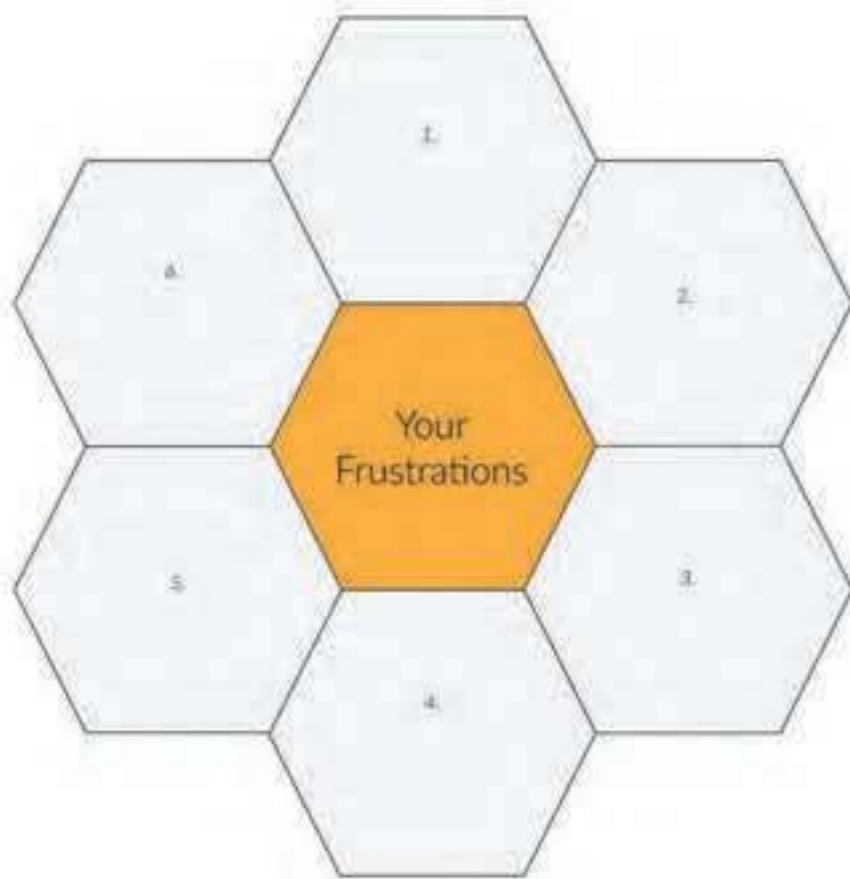## Day 1   Device Screen Digital Tracker

How many minutes/hours altogether?

Rate your achievement

★ ★ ★ ★ ★

Smart goals

Self-reflection

Next steps

	Personal device usage	Professional device usage
Awake and Morning		
Afternoon		
Evening		
Night and Bed Time		

Day 2   Device Screen Digital Tracker

How many minutes/hours altogether?

Rate your achievement

★ ★ ★ ★ ★

Smart goals

Self-reflection

Next steps

	Personal device usage	Professional device usage
Awake and Morning		
Afternoon		
Evening		
Night and Bed Time		

Day 3   Device Screen Digital Tracker

How many minutes/hours altogether?

Rate your achievement

★ ★ ★ ★ ★

Smart goals

Self-reflection

Next steps

	Personal device usage	Professional device usage
Awake and Morning		
Afternoon		
Evening		
Night and Bed Time		

Day 4   Device Screen Digital Tracker

How many minutes/hours altogether?

Rate your achievement

★ ★ ★ ★ ★

Smart goals

Self-reflection

Next steps

	Personal device usage	Professional device usage
Awake and Morning		
Afternoon		
Evening		
Night and Bed Time		

Day 5   Device Screen Digital Tracker

How many minutes/hours altogether?

Rate your achievement

★ ★ ★ ★ ★

Smart goals

Self-reflection

Next steps

	Personal device usage	Professional device usage
Awake and Morning		
Afternoon		
Evening		
Night and Bed Time		

Day 6   Device Screen Digital Tracker

How many minutes/hours altogether?

Rate your achievement

★ ★ ★ ★ ★

Smart goals

Self-reflection

Next steps

	Personal device usage	Professional device usage
Awake and Morning		
Afternoon		
Evening		
Night and Bed Time		

Day 7   Device Screen Digital Tracker

How many minutes/hours altogether?

Rate your achievement

⭐ ⭐ ⭐ ⭐ ⭐

Smart goals

Self-reflection

Next steps

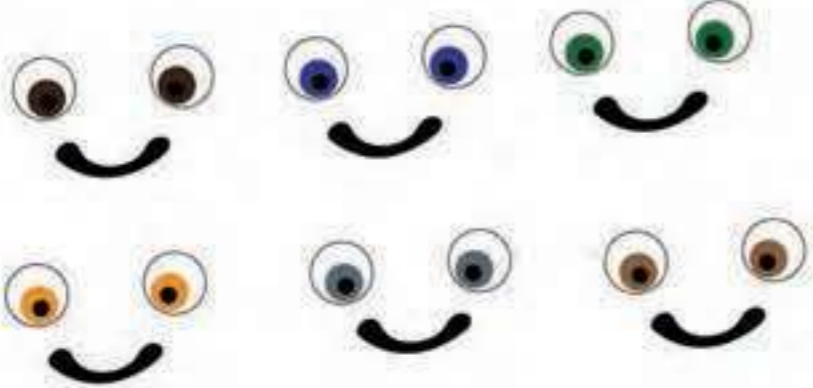|	Personal device usage	Professional device usage
Awake and Morning		
Afternoon		
Evening		
Night and Bed Time		

Time for your new ideas! How can you maintain what you achieve and improve even better your lifestyle to achieve your future goals?

Time for Weekly Reflection and Calculation

Final Monthly Results

Your Thoughts

Next Steps

Time for smile!

What are you grateful for?

The reward for achieving goals

summer

Maybe it is time for good
and new sunglasses...?

time

is

coming

20% off [brand name] sunglasses with this coupon Hasnik2023.*
*T&C apply. Check with the local retail shops or shop online at www.brandname.com

pamper yourself :-)

How would you like to reward yourself?

Idea No 1.

Idea No 2.

Idea No 3.

I, Eye - Notes

TESTING
PHASE

A/B Preferences Online Test

The A/B Preferences Online Test was done by using Usability Testing. The test was sent to the 43 participants of the Online Survey who were willing to take part in further studies through their shared emails.

Two PDFs were sent to have a look at it and share thoughts, constructive feedback and the preferable choice on the previously created usability testing link.

The simple and easy test gave beneficial insights. Both products have half-half preference choice by online participants, which is similar to the A/B Preference Practical 1:1 Test.

Through the collected answers it can be observed that the best approach it will be to actually create 1 product from those two by combing them together. This could be part of the Next Steps too.

Due to the constraint of limited time, in getting the project to print, the initial results (6 participants) are beside and in the Appendix.

The usability testing is still open to collect more answers and benefit the future version 2.

This will be part of the Next Steps. Also, the test is still open to receive the practical filling of the products to be able to understand what can be improved. Tests went very well, met with positive answers and engagement.

The A/B preference online tests between both products do meet requirements that products are useful, supportive and practical.

The Pixel Tracker is a much faster daily activity which required less time, however, the Eyes' Diary because includes additional features is more engaging, and creative and because of that more fun.

The Eyes' Diary could include pages with vision augmentation technologies results of the final project report but because it is still before assessment at this stage was excluded.
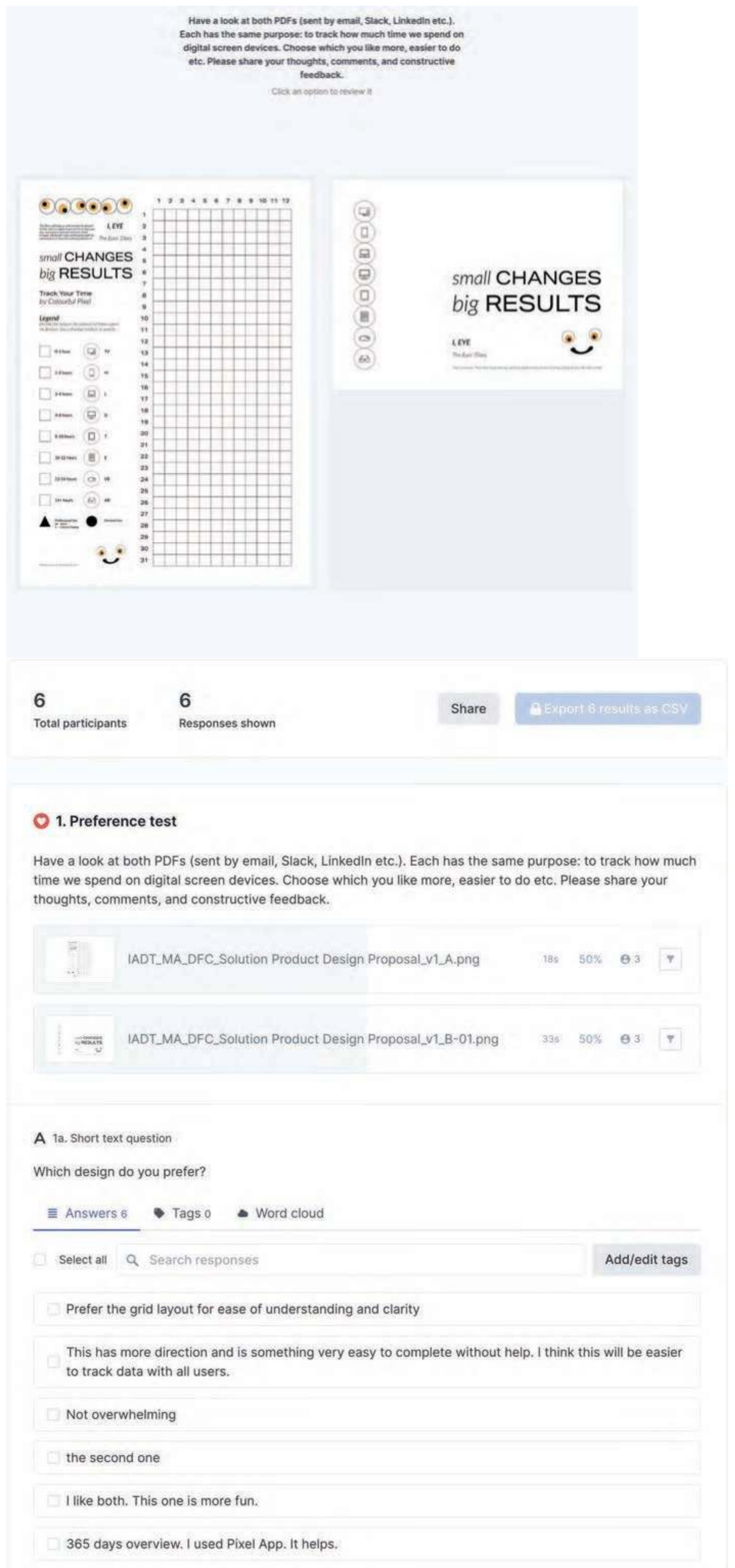

Fig 64. Usability Testing - A/B Preferences Online Test shows equal results and both positive.

A/B Preferences Practical 1:1 Test Recruiting

Participant: The practical testing of both products took place on the 4th of January, Wednesday, an afternoon with the male participant, age 77, Irish, single, retired, previous professional usage of digital screen devices, played in the music band on the bass guitar for all his life.

Using currently: smartphone with touch screen, mobile phone without a touch screen, tablet, laptop, desktop computer and TV. Wears glasses for reading.

Place and Time: The Test took place at the participant's home, in his comfortable surroundings in the living room over a cup of coffee. Testing of both products took approx. 1:30 hour with short breaks between products.

Consent Forms and more images from the Practical A/B Preferences 1:1 Test can be found in the Appendix.

Recruiting of the participant for this practical preferences test took place through an initial introduction to the Master Final Research Project over Christmas, the purpose of it. Confirming the time and date took place by Whats App. The researcher (myself) is well-known to the participant (neighbour). The participant was truly happy and eager to test the products. The introduction took place with a description of the purpose of the research, the aims and

the presentation of both solution products' design proposals in the print demo version (A4 sheet papers printed at the researcher's home).

The Information Sheet and Consent Forms as per IADT (see Appendix) were printed in two copies and read aloud as requested by the participant, read again independently by the participant and signed by the participant including confirmation of using the photographs while doing the testing and the usage of quotation and by the researcher.

All questions were answered before taking a practical test and also answered during testing. All feedback was given while doing tests without specific questions asked, just simply talking through. It was confirmed that the test is anonymous and all shared constructive feedback is beneficial for the project and that test is testing the products, not the participant.

What next? The printed demo A and B products were given to the participant who wants to use them more often in the following days as find them beneficial. Photos of filled pages of products A and B were taken. See moreimages from the test in Appendix. The participant will get a highly printed version of both products to use as he is seeing the benefit of it already.
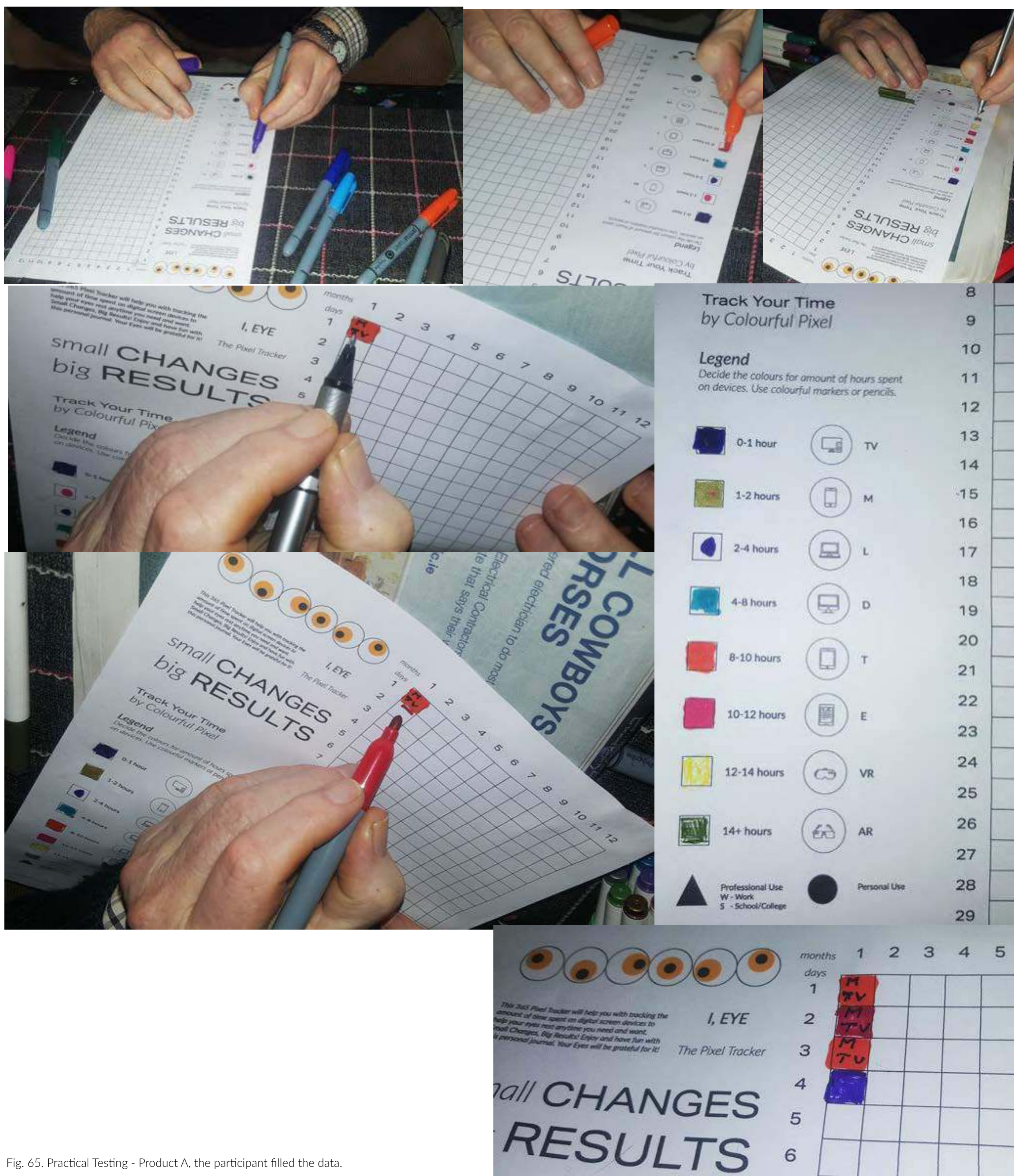
PRODUCT A
THE PIXEL TRACKER

Fig. 65. Practical Testing - Product A, the participant filled the data.

Positive Feedback

The participant was highly interested and eager to try both products and first engage to read the pages of Product B, the Eyes' Diary but choose to do as first Product A, the Pixel Tracker. He said, "it is easier, and quicker".

Product A - The Pixel Tracker

- The test went very well and successfully. The participant was highly interested and eager to try both products. He first chose to read the pages of Product B, the Eyes' Diary and did like it but chooses to do as first Product A, the Pixel Tracker. He said, "it is easier, and quicker".

- The participant himself wanted to fill the 1st, 2nd and 3rd of January and today, the 4th of January to start to track his own usage of devices, especially the smartphone and TV.

- He liked really a lot of markers to choose from, having fun with them and laughter, filling precisely the squares - pixels.

- He understood quickly what needs to be done, and he likes the idea to give colours to time as it is a major aspect and only the letter to the type of devices. Symbols such as triangles and circles he liked but no need for him as he only uses devices for personal needs. He liked various colours but find it later that purple and dark green does not give a good contrast for the black fine liner to place the letter M for the mobile phone and Tv for Tv so he wanted to change.

- He loves the design, simple, clear, fun, horizontal, straightforward, and easy to use. (Although he suggested giving in the corner or on the separate additional page - cover a hint about how the legend could look like, which is a great idea. A small legend demo was done on a separate page). He had really fun as he joyfully shared.

- He was honest with himself and light 8-10 hours on the 1st and 2nd of January, 10-12 on the 3rd of January and 0-1h on the 4th of January, which he said he must change to get less TV, and being on Facebook and more exercise and social real interaction with people.

- He sees the benefit of this product called an Eye or Digital Device Spy Eye Calendar, which are fantastic creative ideas.

Constructive Feedback

Product A - The Pixel Tracker

- Already pre-made legend of colours for the usage of devices but the participant said not everyone can have those types of colours.
- Attach the set of small stickers. (It was explained that it is also the idea for the future version).
- Larger format than A4. For Demo was A4, generally A3 will be in use.
- Write all names of all digital screen devices. The participant did know what is AR but asked about VR.
- Icons of digital screen devices could have colours too instead of initial letters.
- After all days of the month, at the bottom, the calculation of how much together was spent on digital screen devices.
- Colourful legend for the amount of time spent on digital screen devices could also have colours for devices or professional versus personal usage. (But participant self-reflect on it, that it would be too much of colours and it would not give clear data overall).
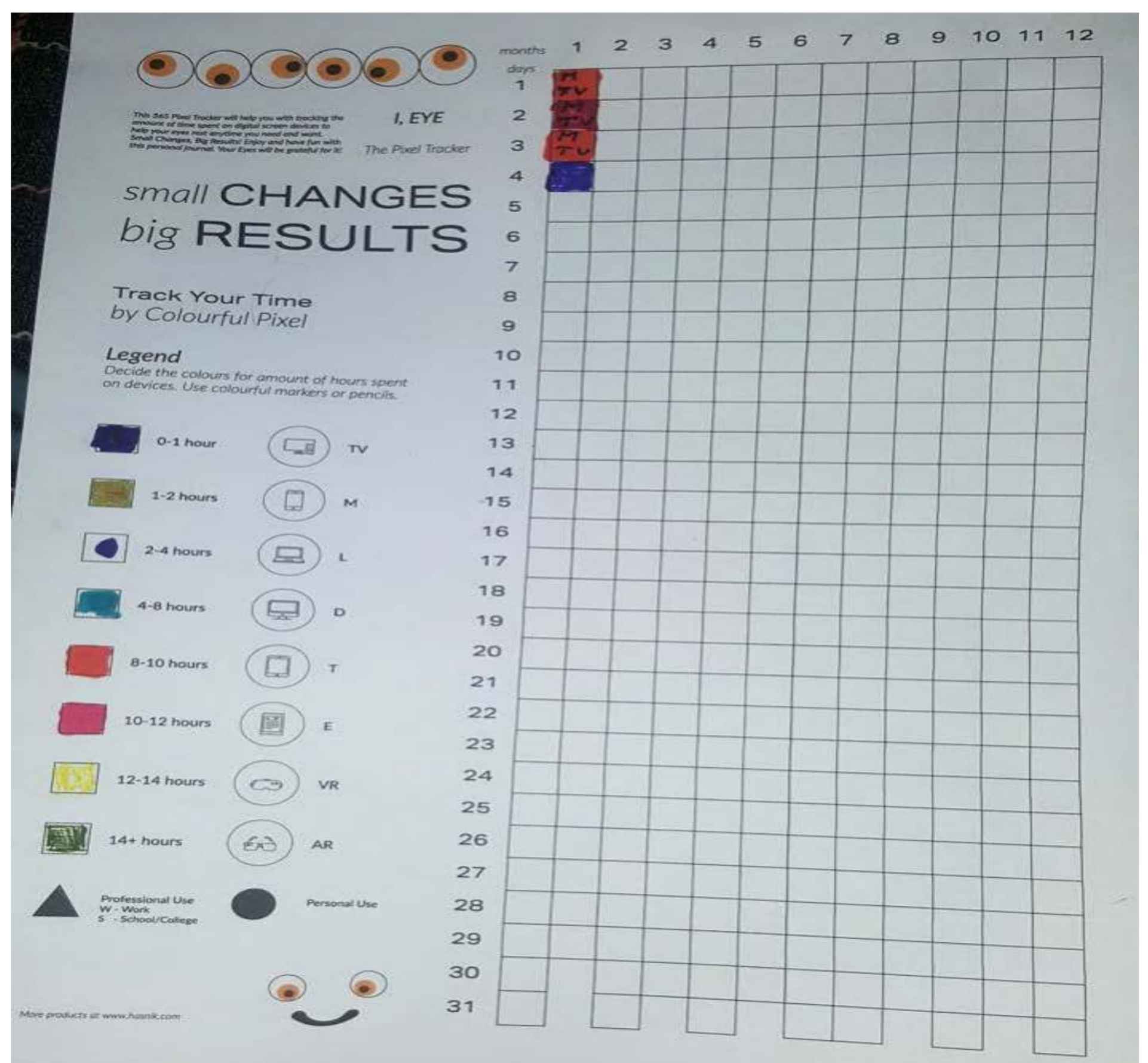
Final results of Mr O'Brian.
Legend filled with colours.
1st-4th January Pixel tracker completed.
1st-3rd January: altogether 30-33 hours on mobile, and TV. 4th-day improvement, only 0-1 h spent on digital devices.
Goals accomplished: social life, physical sports.

PRODUCT B
THE EYES' DIARY - I, EYE

Fig. 66. Practical Testing - Product B, the participant filled the data.

Positive Feedback

Initially, the participant preferred product A, Pixel Tracker, but very quickly he did say the idea of the diary reminded him of his personal diary from his youth and young adulthood which he still has. He said it is even better than the tracker as more can be done. more thoughtful. Although he said the tracker is instantly visible hanging on the wall e.g. the kitchen or next to the TV so he shared that he would like a combination of that two products into one.

Product B - The Eyes' Diary

- He loves the simple, white colour with nice text, in terms of typography and the content itself. As said, "fun, easygoing, made him smile, practical, philosophical, self-awareness, appreciative."

- He really likes the design of the eyes with a smiling face, the colourful eyes, the sample of doodling and the little poem which indeed encourages him to write his own funny one.

- He likes self-reflection, values, goals, gratitude, motivations, goals, and rewards. It really helps to know what must be changed.

- He easily calculated that over 4 days he spent approx 30-33 hours watching TV and being online on the phone mostly and it gave him a good hint that he wants to change.

- He easily established that he wants to exercise, get physical activities, and be more social as he doe feel lonely and it will also help his wellness.

- He was transparent with himself and did talk openly, which is highly appreciated. He loves the idea of space in his eye story and got sentimental in the section about the colour of his eyes' relatives. He decided that few pages he wants to leave so he will have more time for self-reflection.

- It was simple and clear for him to establish the next steps, and what can be done to increase changes in favour of sports instead of passively TV time and scrolling endlessly on a mobile device or tablet (he has the equipment to do exercises e.g. running at home).

- He used to play bass guitar in the rock band and still has it so he shared after the testing that he also wants to come back to it. He likes it and gets help from it already. He does see clearly the benefit of using it.

Constructive Feedback

Product B - The Eyes' Diary
- Larger format than A5, e.g. A4 pages. However, if smaller can be kept in a handbag.
- More pages to write notes, treat as a notebook. (Demo version only had initial pages).
- Why not add a calendar, address book etc.?
- In all places where text should be written, the dots, and lines would be good to add so handwriting is straight and tidy.
- More places for the own full name, including the IADT Consent Forms.
- It could have a bigger font of the little poem.
- Copyrights policies do apply - to add.
- In the section frustrations, values, goals and motives next to the numbers, add dots and lines for handwriting, keeping it clean and tidy.
- Little description of what is Self-Reflection or examples of Values etc.
- Listed vision impairment to make it easier.

Results day by day of Mr O'Brian.
Notes were filled for 1st-4th January.
1st-3rd January: altogether 30-33 hours on mobile, and TV. 4th-day improvement, only 0-1 h spent on digital devices.
Smart goals are established, and honest self-reflection is followed by the next steps.

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Overall Testing Conclusion

Both ideas were established based on the results of the primary research method and got high feedback, which overall is a success for this final project report.

Both products received positive feedback and did reach balanced preference tests in a favour of both almost equally. See Appendix. Both products could be given to the public and chosen by individual user needs.

More testing needs to be required in terms of practical filling in the Pixel Tracker and the Eyes' Diary to observe which product will fit which type of audience. Basic demographics would be one of the main points followed by the needs of users and their time which can dedicate to tracking their usage of digital screen devices daily as it is required commitment to establish new habits and observe current ones.

Also, testing will include the quality of the paper, matt or gloss, weight and even size, which will fit the most to the users.

Both products do help, support, inspire and motivate the public to understand their awareness, attitudes and acceptance towards the vision augmentation technologies, which was the goal, mission and vision of the project and personal aims and objectives.

Indeed those products do help, support, motivate and inspire to track usage of digital screen devices in a favour of other activities, more active than passive.

Those products do bring new awareness, attitudes and acceptance of vision augmentation technologies for desire, entertainment, and professional and personal use.

Furthermore, both products are friendly to the users due to the simple and easy approach and the visual communication branding itself, which makes a smile on users' faces.

Both products could be developed further into a digital mobile application, however, this will be kept for MVP 2, which will require additional design processes including but not limited to interviews, surveys, user journeys, user tasks and user flow, low, mid and high fidelity wireframes and user testing etc. This can be taken into account in Next Steps.

OUTCOMES
CONCLUSIONS

OVERALL OUTCOMES AND CONCLUSIONS

The primary research went very well. The number of participants went above the requirement which was 100. The research studies received 163 answers, with most from Ireland, the UK and the EU (112) as discussed and agreed to with supervisor.

The solution products design proposal and the testing itself as well were successful as described in the conclusion in each corresponding section.

Due to the ethics and constraints such as timing, the primary research included a survey to investigate the general public awareness, attitudes, and acceptance level of vision augmentation technologies, both types of technologies, assistive technologies for health for those who are visually impaired and as well technologies for desire, entertainment and/or performance skills.

This was the main aim and objective of the research studies to conduct quantitative data to fill the discovered gap in the academic peer papers review while at the same time building up preparation for qualitative data on public attitudes, and feelings about innovative technologies such as VR and AR, knowing what they are, willingness to try or no, understanding the public awareness of the health and safety product warnings, not knowing that VR is banned for children below 13. etc.

This survey itself and the unbias constructed questions and multiple answer choices do bring information about eyesight and augmentative technologies for vision and the corresponding relationship between them and a variety of potential attitudes, acceptance and awareness.

The survey was conducted in an unbias manner to give the space for participants to answer honestly without directing any answers wrong or right to the public. Similar when came to testing products.

Anonymous participants do share that they found the questions and topic very interesting as it gave them a reflection on their own attitudes and daily morning and bedtime habits within the digital devices.

The proposed products did confirm the positive opinions and benefits of using them as a solution to track the number of hours spent daily in front of digital screen devices.

This is an interesting additional outcome which is highly beneficial and can potentially positively impact changes in the daily morning and bed habits which can benefit eyesight and health in general, which could be another research area described in the Next Steps.

The time dedicated by participants to both professionals and personal needs in front of digital devices screens including TV, mobile phones, tablets, e-readers, computers, and laptops is high as per the Survey Conclusion and Data and Testing of Products.

Most of the participants who are exposed to digital screens daily do not adjust their attitudes to benefit their eyesight even while at the same time expressing the Computer Vision Syndrom. More research would need to be done on what prevents them from it.

The potential further harm to eyesight due to already experiencing Computer Vision Syndrom some of them and the excessive time exposition is possible while at the same time naturally ageing. However, there is no significant data that confirms that digital devices do cause lower eyesight. The main outcome is that participants can spend on average 8 to 12 hours for professional needs on screen devices plus personal on a daily or almost daily, which can be 1/3 of the day.

This relationship between all three aspects, awareness, attitude and acceptance could be changed for the better by promoting general information and healthy habits which could prevent the public from experiencing the Computer Vision Syndrom and overall wellness of a more active than passive life.

It also could increase reading of all types of digital devices product safety and warnings by

requesting policies from the producers not only VR but as well desktop computers, laptops, mobiles, e-readers, TV etc.

A small portion of participants do understand the impact and do maintain the healthy habits of limiting digital screen devices. It will be good to understand further what are differences between those who do not pay attention to it.

More than 100 of the participants do wear glasses, and contact lenses, and have or plan to have laser vision corrections. It is important to highlight that.
Further investigation would take the correlation between lifestyle, passive versus active, personality traits etc. Because partial vision loss does not bring significant differences in their attitudes toward the usage or not usage of digital screen devices in terms of the number of hours daily and weekly.

This study does not show yet the possibility of one conclusion about any sort of addiction as it is the initial stage of understanding the public and their relationship. However, is clearly visible that most of the participants spend half of the day using digital devices.

The studies do show a significant amount of hours spent on devices but there is no established recommended time by health authorities that is the actual limit for using each type of digital screen device either.

It is interesting to know what makes people want to dedicate a number of hours, especially in their personal life in front of digital screen devices and how they feel about it. Some participants do share their concerns about eyesight, another not.

However, the testing of the products established on the Personas did show that there is a need for change, for a more active than passive lifestyle just by acknowledging that over the last 4 days, 30-33 hours were dedicated to Tv and mobile phone. This phase requires much more testing and observing the awareness, attitudes and acceptance levels.

Interesting is that many participants are not willing and are not interested in trying VR or AR which is also an insight worth reviewing it in depth. And overall opinion is around 3 on a scale of 5 while 1 dislikes and 5 is like for both VR headsets and AR glasses.

For the purpose of professional usage of VR and AR, more studies will need to be conducted. Especially if there is a willingness to use those types of devices instead of standard desktop computers and laptops especially by taking into account that users of VR did experience various negative symptoms. Because of the small fraction of users who uses VR and AR for their professional life, those studies do not establish enough data to make outcomes about VR/AR for work purpose and corresponding acceptance, awareness and attitudes level of the public towards those technologies at job or school.

ERASE THE MYTHS ABOUT VISUALLY IMPAIRED

Most of the participants did experience assistive technologies for vision loss, although most of them experienced only a few not all.

However, approx 1/5 didn't have any experience with any of the assistive technologies in their personal life. The conclusion is that they had no experience with visually impaired people at all either. Because of that, there is a foundation of the previously described myths which do still exist as per NCBI.

By building the relationship and dialogue between the general public and visually impaired people both social groups could benefit from it and the level of awareness will change for a better within the attitudes towards themselves and others and overall the acceptance scope and the actual attitude to use digital devices with self-reflection.

Increasing opportunities and chances of experiences with visually impaired people will bring knowledge about assistive technologies, and causes of eyesight loss.

The new experiences with visually impaired people and awareness of it itself change feelings and attitudes and bring acceptance to reevaluate own choices and behaviours.

It is much easier to change daily habits by knowing the reason why and accepting it within as well as being able to have direct or indirect contact with those who do not have a choice anymore by dedicating the sense of vision to other activities than digital screen devices, which in testing phase came so clear.

Building the relationship with government bodies such as the health sector in Ireland HSE, United Kindom NHS and the respective health sectors in European Union and North America would potentially decrease the costs of assistive technologies for vision by preventing from it happening by increasing public awareness by sharing data, findings which could potentially do increase much better care of their eyes by impactive positively public attitudes and inform about the eyesight itself.

New policies could be established to prevent it before it happens for a good of All.

The most beneficial outcome is the data itself, positive participants' willingness to take part in both surveys and testing, discovered the magnificent amount of statistics and overall important insights and the finding that both solution products proposal designs did meet the success of being wanted, needed, which do support, help, inspire and motivate to the positive change.

STAKEHOLDERS
ECOSYSTEM

Based on the conducted research, within
the outcomes and conclusion, the future next
steps for this project will be to establish
a connection with the stakeholder ecosystem to
provide a positive effect on the stakeholder as
a group (public) and as individuals within
the public (person) and the stakeholder
ecosystem itself.

This perspective will serve as the final
starting point for the upcoming results of
the case studies.

The stakeholder ecosystem can be established
at the beginning as starting point and/or in
the end to open for the upcoming stages of
the design process.

The strategy for this project is to continue to
bring positive changes to society, help and
support public awareness, attitudes and
acceptance levels along the vision augmentation
technologies by continuously doing research,
testing the proposed solution and creating a new
one to provide information available openly to
the public and to the corresponding ecosystem
of stakeholders.
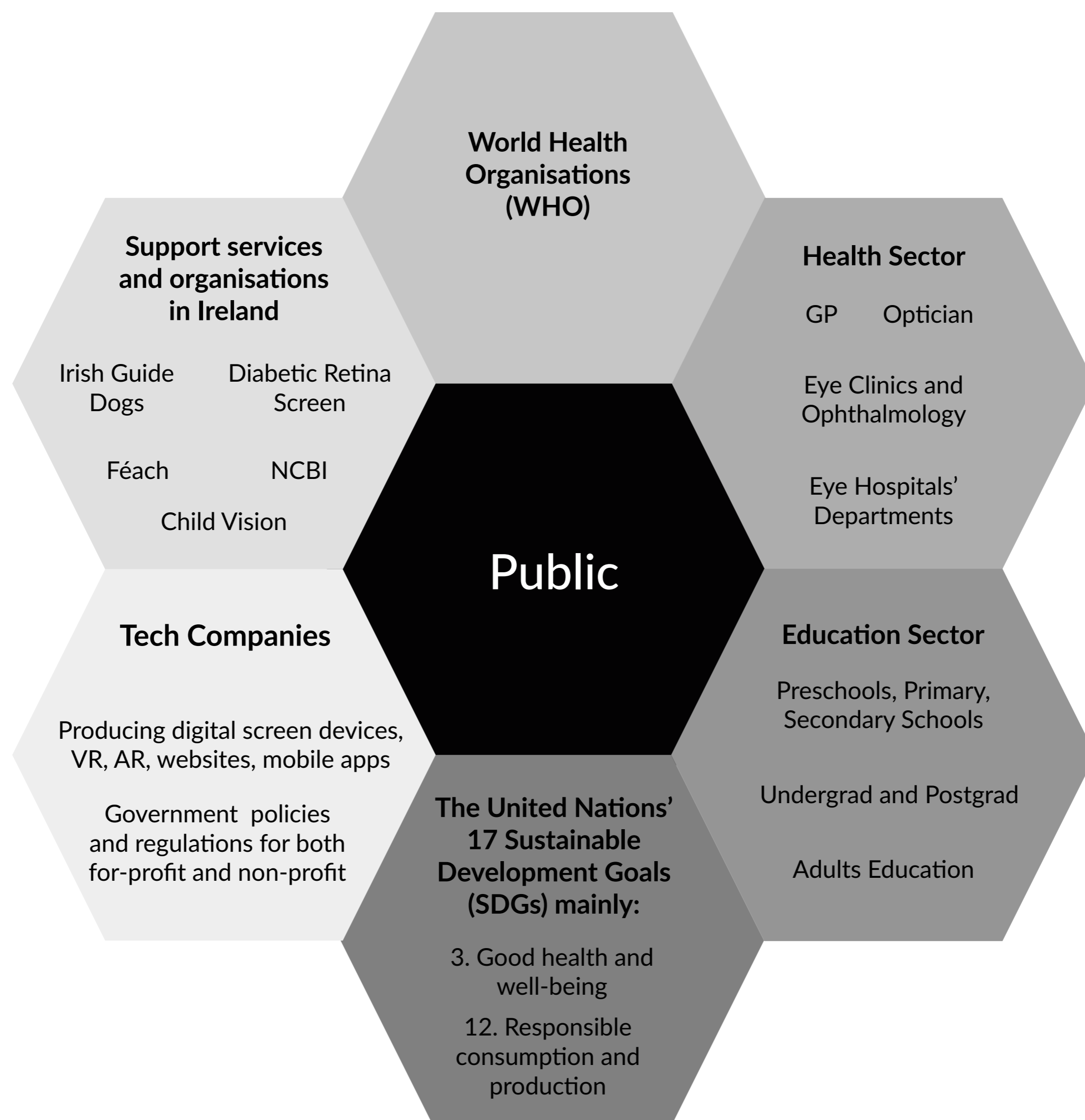
Fig. 64. Stakeholders Ecosystem Map. Based on the project itself with additional information.
Source: the United Nations 17 Sustainable Development Goals and Fighting Blindness.

Support services and organisations in Ireland listed but not limited to:

Féach is a support group for parents of blind and visually impaired children. More at: www.feach.ie

ChildVision provides education for blind and visually impaired sighted children and young adults in Ireland. More at: www.stjosephsvi.ie and info@childvision.ie

Irish Guide Dogs for the Blind is a national charity providing help to blind or vision-impaired persons and their families. More at www.guidedogs.ie

Diabetic Retina Screen The National Diabetic Retinal Screening Programme is a government-funded screening programme offering free and regular diabetic retinopathy screening to people with diabetes including children above 12 years old. More at www.diabeticretinascreen.ie

Deafblindness

The Anne Sullivan Foundation for Deafblind People helps low-functioning deafblind children In Ireland. More at: www.annesullivan.ie

Deafblind Ireland supports deafblind people, their families and professionals working in the field. More at: www.deafblindireland.ie

NEXT STEPS
NEAR FUTURE

The research and design do not stop.
Design ever ends and can be put further to benefit the general public within the findings and provide product design solutions.

Next steps after completing successfully Master's Degree with graduation, I am looking forward to further developing the solution products design proposal and testing in practice on 1:1 and in the focus groups both products, develop them into one as per participant suggestion, which I feel is a good idea because both products met equally with positive feedback. However this might change if more participation will take place, so I would like to investigate it.

Both products could also be developed into a mobile app with live tracking of how much time the user does spend on devices for those who prefer digital products versus analogue.

After this, I am looking forward to contacting stakeholders to share insights and to do that more research needs to be done to understand the possibilities.

Masters's studies were amazing experiences, wonderfully challenging, growing, positive, and important part of my development both professional and personal and I am looking toward to developing already learned skills even more within the following stages of higher education and with a career as a designer for a good change in a public sector with a focus on health, awareness, acceptance and attitudes levels of vision augmentation technologies.

I am looking forward to applying for this type of career-specific in this area of research and design to design a positive change for the public, for people, for you, and for us.

One of the steps will be as well to upload the Final Project Report Artefacts: Solution Products Design to my portfolio, on Behance and my web: www.hasnik.com.

Design for Change was the best choice I could ever dream about and I am truly grateful for everyone as listed in Acknowledgement who had been on this journey with me.

Special Thanks to Shirley and Clyde who encourage me to make this choice long ago before I even apply and for their amazing contribution, motivation, friendliness and help over those 16 months.

Special Thanks to Hilary for truly outstanding extraordinary supervision of my Final Thesis Project Report.

One of the steps to which I am looking forward is to reading my classmate Final thesis Projects as they were truly interesting and I am sure I will; learn from them too, both as a designer and as a person exploring the topic of their research work.

There is also a time to celebrate, rest and relax to enjoy the accomplishment and be grateful peacefully for all that I learn from everyone, all people at IADT and GBC, IwB, the studies itself, the design methodology which I approached, and the participants.

I will be taking further steps in education on the PhD as promoted by my supervisor, Dr Hilary Kenna, for which I am grateful. First, I have to consider the right timing and career next steps to actually first enjoy what is now fully completed.

I am looking forward to the presentation as the final part of the assessment and as well travelling adventure to let my eyes rest from digital screen devices as the last months had been intense within my job and education, however, I wouldn't change any aspect of it, as in the challenge is a true joy and from it, a good change comes within.

Thank you.

Kind Regards,
Katarzyna Hasnik

Please find more product ideas and the next steps for further research in Appendix.

REFERENCES
RESOURCES

REFERENCES
RESOURCES

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APPENDIX *REPORT*
SUPPLEMENTARY DESIGN MATERIALS

TABLE *OF CONTENTS*
APPENDIX FINAL PROJECT REPORT

DESIGN *STYLE GUIDE*

VISUAL INDENTITY ELEMENTS

BRAND *STORY*

Visual identification of the brand is based on the conceptual thinking of the discovered findings and insight in the primary and secondary research.

The design style guide emphasises the actual content itself by introducing the accent colours and shapes of the eye irises.

The brand was created on the various constructively selected inspirational mood boards of minimalistic design inspired by Scandinavian, Japanese, (Japandi, Wabi, Sabi, Yügen, Kanso), Soviet, PRL (The Polish People's Republic). To light up the project and be more friendly, simple, joyous illustrations were created which were a starting point for the solution products design proposals. All together it created a unified base for the brand between the Final Project Report and two Product Designs.

The logo itself and brand guidelines will be established as the Next Steps based on the additional public research.

TONE *OF VOICE*

Informative approachable language dedicated to a wide range of audiences, the general public and industry experts without too much technical jargon, however still the formal, academic tone of voice is respectful, inclusive, and diverse excluding any bias, and avoiding informal, casual language, although still friendly and easy to digest by various age groups from teens to seniors.

Attention to THREE AAA

AWARENESS
ATTITUDE
ACCEPTANCE

VISUAL *DIRECTION*

Informative and Accessibility Design
Readable easily by a wide range of audiences, including readers with low vision.

Clean, clear, standard to large print format, inclusive and diverse audience, dedicated to the general public and as well visually impaired people.

COLOUR *PALETTE*

PRIMARY
Black and White
SECONDARY
Greyscale Monochrome
TERTIARY
Variety of Cold and Warm Colours Inspired by the Iris
ACCENT
Cyan, Yellow and Reddish C = 0 M = 90 Y= 85 K= 0

BROWN	C = 50 M = 70 Y= 80 K= 70	
BLUE	C = 100 M = 95 Y= 5 K= 0	
GREEN	C = 90 M = 30 Y= 95 K= 30	
AMBER	C = 0 M = 50 Y= 100 K= 0	
GREY	C = 20 M = 0 Y= 0 K= 70	
HAZEL	C = 35 M = 60 Y= 80 K= 25	

Black to White across **TEN SHADES OF GREY**

Printing Values
CMYK cyan magenta yellow key

BLACK	C = 0 M = 0 Y = 0 K = 100
GREY	C = 0 M = 0 Y = 0 K = 90
GREY	C = 0 M = 0 Y = 0 K = 80
GREY	C = 0 M = 0 Y = 0 K = 70
GREY	C = 0 M = 0 Y = 0 K = 60
GREY	C = 0 M = 0 Y = 0 K = 50
GREY	C = 0 M = 0 Y = 0 K = 40
GREY	C = 0 M = 0 Y = 0 K = 30
GREY	C = 0 M = 0 Y = 0 K = 20
GREY	C = 0 M = 0 Y = 0 K = 10
GREY	C = 0 M = 0 Y = 0 K = 5
WHITE	C = 0 M = 0 Y = 0 K = 0

=
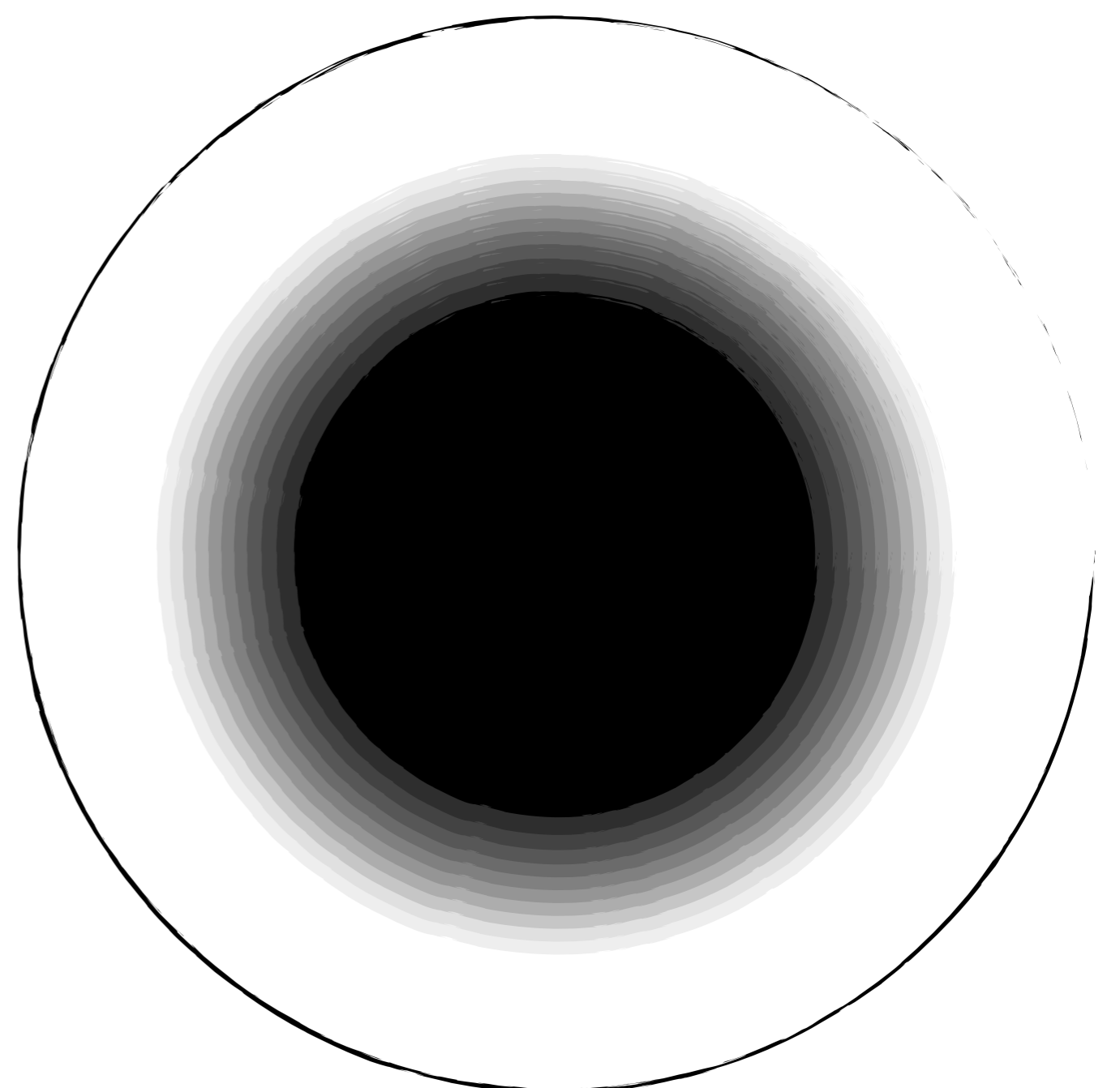
TYPOGRAPHY *CHOICE*

Typography choice matters as the text needs to read and look well. The choice is based on fonts union as well as the contrast.

Both Family Fonts, Lato and Aktiv Grotesk have a wide range of representations of typefaces including different letterspacing (character spacing or tracking), kerning, and leading, within various heights, thicknesses, weights, and styles.

Both fonts are quite opposite to each other although at the same time well cooperate together bringing a harmonious contrast.

LatoLatin looks higher due to smaller character spacing for individual letters. Aktiv Grotesk Ex character's dedicated spacing is wider, which brings the optical feeling that the font is squashed.

This optically brings the visual feeling that the LatoLatin font is higher than Aktiv Grotesk Ex, which naturally brings balance when both fonts are placed close to each other.

This emphasises the visual direction of dualities.

TYPEFACE *ONE*

LatoLatin - Sans Serif Typeface
Google Font was designed by Warsaw/Warszawa-based designer Łukasz Dziedzic in the summer of 2010. "Lato" in Polish means Summer.

Hierachy and Purpose
The major font used as Primary, Secondary, Tertiary
It is highly recommened font for both print and web materials.

Colour
Primary
Black font on the white background
Secondary
The spectrum of grey K - 90 to K - 70 on the white background
Tertiary
White font on the black background
Accent
Accent colours on the white, grey and black background

Style and Weight
LatoLatin is used in a wide range of weights and styles but for the purpose of accessibility certain are excluded.

LATOLATIN LIGHT	LatoLatin Light
LATOLATIN LIGHT ITALIC	*LatoLatin Light Italic*
LATOLATIN REGULAR	**LatoLatin Light Regular**
LATOLATIN ITALIC	***LatoLatin Italic***
LATOLATIN MEDIUM	**LatoLatin Medium**
LATOLATIN MEDIUM ITALIC	***LatoLatin Medium Italic***

Font Size
Cover
HEADLINE Headline - document size influences the font size

Spread Pages
HEADING Heading 1
HEADING Heading 2

SUBHEADING Subheading 1
SUBHEADING Subheading 2

SUBHEADING Subheading 1
SUBHEADING Subheading 2

BODY TEXT Body Text 1
BODY TEXT Body Text 2

BODY TEXT Body Text 3
BODY TEXT Body Text 4

Reference, Figures, Label 1

Aligns

Left Align

TYPEFACE *TWO*

Aktiv Grotesk Ex - Sans Serif Typeface
Adobe Font designed by Dalton Maag is a typeface design studio founded in London, in 1991.

Hierachy and Purpose
The minor used only as Accent Font
Aktiv Grotesk Ex is only used as the Accent Font introduced to certain Titles, and to Subtitles, Headings and Subheadings however not in all instances.

Colour
Primary
Black font on the white background
Secondary
The spectrum of grey K - 90 to K - 70 on the white background
Tertiary
White font on the black background
Accent
Accent colours on the white, grey and black background

Style and Weight
To bring a minimalist feel to quite the bold choice of Aktiv Grotesk Ex regular is used.

AKTIV GROTESK EX REGULAR

Font Size
Type of document influences the font size

Cover
TITLE Title

SUBTITLE

HEADLINE

Spread Pages
HEADING

SUBHEADING

Aligns

Left Align

GRID *LAYOUT*

3 columns per 4 rows and reminded 1/35 with an equal gutter
and margins applicable.

ILLUSTRATIONS
ICONS

Created especially for the purpose of this project. Illustrations
are simple, friendly and joyous. Bringing smiles to readers.

Icons (digital screen devices and user icon) - Copy policies apply.
Contribution to Konkapp at Free Flat Icon.
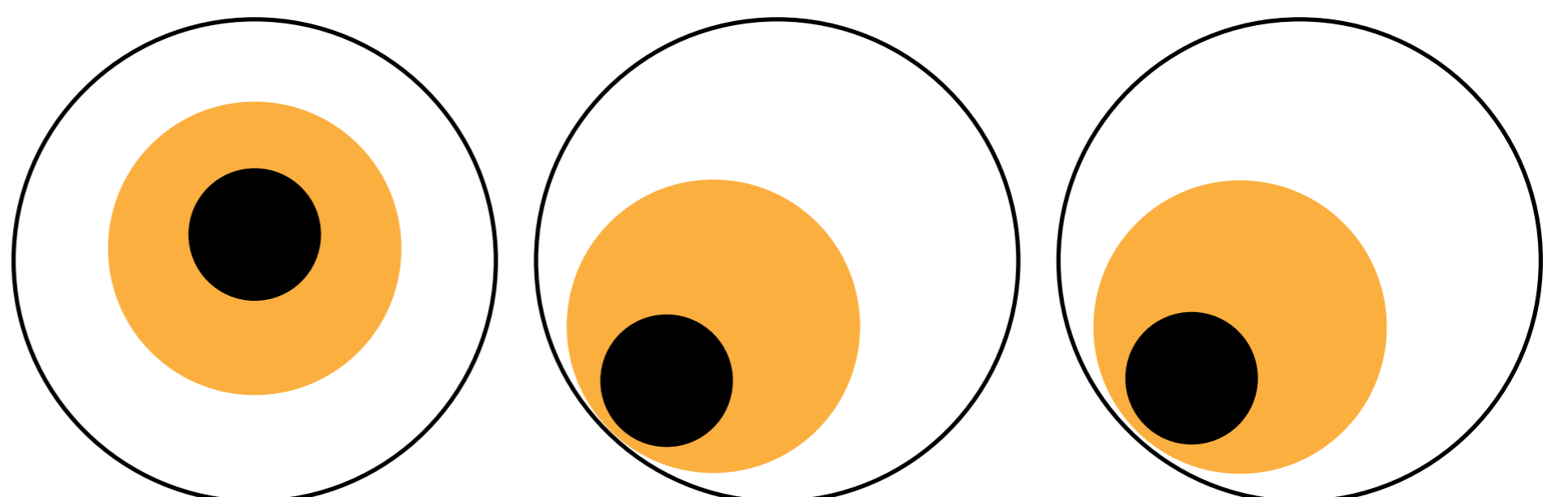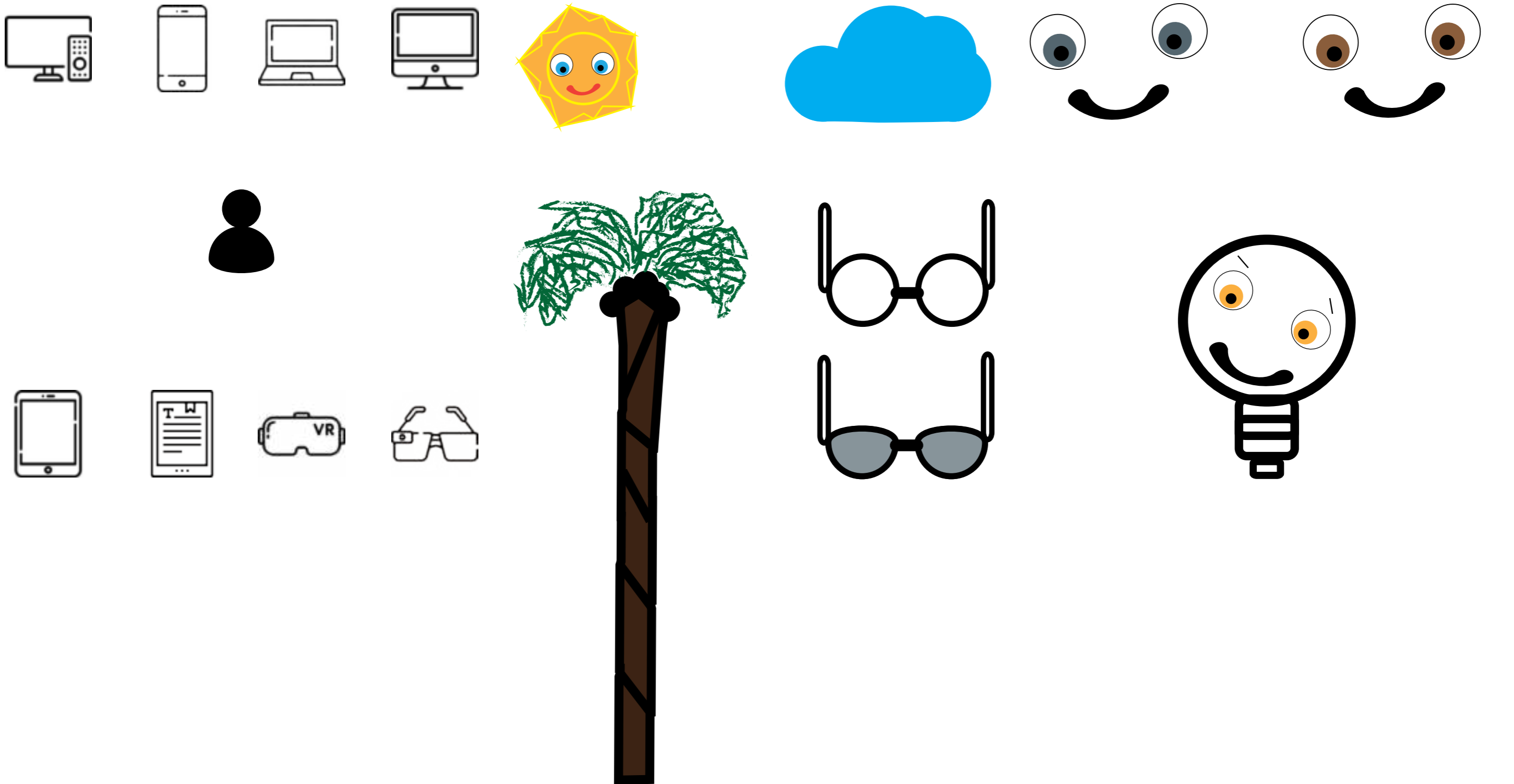
CHARRETTE *REPORT*

26-30 SEPTEMBER 2022

TABLE *OF CONTENTS*
CHARRETTE REPORT

CHARRETTE *OUTLINE*

RESEARCH FOCUS
Research of the current knowledge and opinion of the participants on augmentation of the body and mind.

Day 1: Monday 26 September
Location: IADT, Campus
Time: 16:00
Charrette Launch by Clyde Doyle, Christopher Pandolfi, Shirley Casey, Robert McCullagh, and others

Introduction Team
Time: 16:30 - 17:05 Teams (facilitators, participants and advisors) organisations and distributions.
Location: the Library, 1st floor
Participations' welcome, introduction to each other, the research principles and the topic.

Informative Written Introduction
Time: 19:00
Location: via email
The general information on the topic, digital tool tutorials, contact details, inspirational quotes on curiosity and fun can-do attitude welcome, etc.

Day 2: Tuesday 27 September
Location: on Campus at the Library, 2nd floor
Time: 10:00 - 17:05

Supervisors and Visitors:
Time: 13:30-13:45 Christopher Pandolfi.
Time: 16:30-17:05 Dr. Hilary Kenna, Steven Nestor, Robert McCullagh.

WORKSHOP PLAN
1/ Welcome and introduction again to the rest of the new participants. The day started with getting to know each other better, and team warm-up activities, etc. Administration basics as e.g. official forms introductions and requests to sign off; general requirements and team rules, together with establishment of breaks; timetable and availability of individual participants.
Breaks: 10:30-10:45, 13:00-14:00 & 15:30-15:45
Update Breaks: each break increase by extra 15 minutes as per students requests.
2/ Introduction to manual and digital tools: library computers, personal laptops, tablets, mobiles, wi-fi help with the IT support desk, manual tools (pen&paper, stationery suppliers), Miro - the digital whiteboard tool access, videos tutorials, practice, Q&A.
3/ Team collaboration and cooperation principles and activity of team values - manual groupexercise, voting, discussion, Q&A; introduction to project management warm-up exercise in Miro, voting, discussion on the Agile and Project Management chosen strategies. Research Keywords and Definitions.
4/ Manual exercise: individual key words activity on the topic, group exploration of the topic and discussion on the specific keywords.
5/ Further group research activity by using the digital tool Miro: keywords, terminology, definitions, sources and discussion.
6/ Introduction to Persona and Empathy activity. Manual exercise: The team was divided to work individually on creating their own Personas. After the group discussion took place on the created personas' followed the empathy exercise.
7/ Team collected feedback, Q&A.
8/ 1:1 session with Promotor Dr Hilary Kenna 17:05-19:30.

Day 3: Wednesday 28 September
Location: on Campus at the Library, 2nd floor
Time: 10:00 - 17:10

Supervisors and Visitors:
Time: morning introduction to 1st year student of MA DFC Heitor Laforga by Shirley Casey.
Time: 10:00 - 14:00 Heitor Laforga present at the full morning and early afternoon session; introduction of the team, insights into the research and new participant.
Time: 13:30-13:45 Christopher Pandolfi.
Time: 13:20-13:40 Robert McCullagh.
Time: 15:50-17:10 Dr. Hilary Kenna group activity.

WORKSHOP PLAN
1/ Recap on what we know so far and where we are going with our research, Q&A.
2/ Library introduction to the section on the technology books relative to the topic; followed with Miro's activity in research of the images reflecting the collected so far insights of external vs internal augmentation of the body, and for the augmentation to fix, repair, and heal versus for the desire to improve, and get better, stronger.
3/ Further research questions and group discussion on the values and importance, needs, goals, and desires, of the augmentation, social, medical, individual, demographic, and age boundaries, exploration of internal and external, for health and for desire augmentation of the human body and mind.
4/ Questions and research followed a group discussion on the communication of the devices within the user/patient, external bodies, and other devices, and unification between technology devices, the future of technology for health, human body and mind in the next 20 years from now, timeline activity, analogue, manual, digital.
5/ Research, group activities on the importance of privacy, data collection and protection, and various policies.
6/ Stakeholders Ecosystems activity run by Dr Hilary, group discussion, further guidelines.
7/ Team collected feedback, Q&A.
8/ 1:1 session with Promotor Dr Hilary Kenna 17:10-18:20

Day 4: Thursday 29 September
Location: on Campus at the Library, 2nd floor
Time: 10:00 - 17:10

Supervisors and Visitors:
Time: 14:30-14:50 Christopher Pandolfi.
Time: 15:10-15:20 Shirley Casey afternoon.
Time: 16:20-17:10 Steven Nestor, Robert McCullagh.

1/ Recap on what we know so far and where we are going with our research, Q&A.
2/ Continuation of Stakeholders' Ecosystem with a focus on environment, manufacturing, religion and ethics, Q&A.
3/ Iceberg research activity, group discussion on the layers of the system - multiply scenarios of similar personas versus individual situations, positive and negative based on
the stakeholder's ecosystems and possible access to augmentation for a need of health. Chris's visit while doingthe activity group, further guidelines.
4/ Group work on the presentation while having discussions with advisors. Divided roles, collecting insights, content, images, tutorial on the digital online Slidesgo presentation tool and group choice of the visual look of slides.
5/ Team collected feedback, Q&A, gratitude and an official goodbye to those students' who won't be available on Friday.

Day 5: Friday 30 September
Location: on Campus at the Library, 2nd floor
Time: 09:00/10:00 - 13:00

1/ Four animation students present in the morning session came in at various times.
2/ Additional new students took part due to interest in a subject, quick welcome and introduction to our team, subject and collected insights.
3/ Individual Persona activity drawing exercise based on their individual participation time.
4/ Group presentation and discussion on the empathy of their created personas.
5/ Final discussion on the collected insights to be presented in the presentation, the importance of regulation on the aspect of the law, social ethics and morals on the augmentation of the body and mind.
6/ Working on the presentation and practising presenting it. Working with the team on the fun and confidence to present together. Divided roles. Final decisions.
8/ Team collected feedback, Q&A, gratitude and an official goodbye.

PRESENTATION
Location: on Campus, room: A019
Time: 15:00 - 18:00
20 min each allows for,5-10 minutes to present, 10 mins for Q&A at 15:20, started at 15:30.

Vas

Christina

Sean

Lauren

Abbi

Josh

Katarzyna

Vas

Bella

Aaron

Conor

Persona

Thomas

Aoife

Jordan

Keelin

Bobby

Heitor

Hilary

Robert

Chris

Steven

Clyde

Shirley

CHARRETTE *TEAM*

ADVISORS
Promotor Dr Hilary Kenna
Robert McCullagh
Christopher Pandolfi

VISITORS
Steven Nestor
Shirley Casey

OBSERVANT
Student of the 1st year of MA DFC, Heitor
Laforga

PARTICIPANTS

Animation Students
Jordan Morris - 5 days (morning and afternoon)
Thomas English - 5 days (morning and afternoon)
Keelin Kusch - 5 days (morning and afternoon)
Aoife Obyrne - 4/5 days (morning and afternoon)
Vasiliki Zafeiri - 3 days (morning and/or
afternoon)
Bella Quinn - 1 day (morning and afternoon)
Bobbie O'Neill - 1 day (morning and afternoon)

Business Management Students
Conor Dunne - 4 days (morning and afternoon)
Aaron Mulligan - 3/4 days (morning and/or
afternoon)
Joshua Whelan - 3/4 days (morning and/or
afternoon)
Abbi Stewart 3 days (morning and/or afternoon)
Lauren Flynn Hannon 3 days (morning and/or
afternoon)
Christina Marini 2 days (morning and/or
afternoon)
Sean Dunne 1 day (morning and afternoon)
Lee Doyle N/A (transfer to other group)

FACILITATOR ROLE

My role was to inspire, motivate, organise,
facilitate and lead the research and group of
participants while at the same time being a peer
to them by aiming to empower the group, bond,
and establish values, principles, needs and goals
of the research as well as the group as a whole
team by taking into account individual
participants and their unique skills,
the study field, own interests and points
of view on the topic.

It was to prepare research and design activities,
by first introducing manual and digital tools,
explaining the brief of each exercise, and
answering all questions while at the same time
encouraging the group to answer questions too,
collect feedback, recap every day.

My role was to create a space welcoming,
comfortable, open-minded and safe for
brainstorming together, active listening, and
discussing topics which might bring certain
unease due to the relation of the human body,
mind and health, desirable skills or health needs.

My duty was to take constructive feedback from
advisors, visitors and facilitators and reevaluate
research direction, and team engagement on
the topic on specific days and sessions and ask
for their reflection and to feel on it by modifying
what is needed to collect insights while at
the same time bring fun to everyday activity to
work effortlessly and fully engage.

Part of my role as well it was to support the
group with any technical needs such as wi-fi,
digital tools, library search books, etc. to help
with any obstacles that participants faced.

In the end, it was to create the presentation, and
present it while at the same time trying to
engage others in a presentation by working on
confidence by dividing roles among those who
felt comfortable with it.

CHARRETTE *OUTCOMES &* INSIGHTS *GENERATED*

Interesting insights came out of the Charrette as a result of intense workshops, brainstorming, openminded discussion, team and research values, great group collaboration and various design activities and exercises as follows:

1/ Polarities depending on personas needs and goals: Need vs Desire, Internal vs External, Temporary vs Permanent: Truly inspiring and very new it was to find out that the augment of the body and mind can be for need or desire, or both. Need most likely will classify due to physical or mental health issues, damage, injury, disability, and desire for the pure levelling up of skills, and abilities, both physical and mental.

As well another new to me polarities was interesting to observe that certain participants prefer to have the technology installed internally and permanently and others are willing to try even for health problems just external devices, temporary or permanent depending on the need. Participants did express freely their emotions and feelings, which benefit a lot the further stages of research and actual understanding of the topic which indeed is quite intimate and personal.

The environment which was created helped the group to feel safe and comfortable to talk about their needs and desires and to feel empathy for those who are facing health issues.

2/ Data: Regulations and Policies on data collection, by asking the important question who collects, why, how it is done, what exactly, where

is it sorted and for how long. The group explored privacy concerns, communication between users, providers and other digital technology devices, and 3rd parties, and the importance of establishing moral and ethical standards.

3/ Values: The team values reflected the value of the importance of trust and safety within the products and services for the augmentation of the human body, across medical health, supplier access, and insurance, and the source itself, and regulation established by the government through the impact on the environment.

4/ Ideas, new terminology, influence and impact, access: Participants open a new horizon for me in terms of existing technology for augmentation and their own ideas were truly inspiring and extraordinary, while at the same how those technology devices could potentially change someone's lives. As well impact and influence those around them from the stakeholders of the close ecosystem as family and friends, peers, too much further, as a celebrities, society, government, suppliers, environment, religious, institutions, and organisations and companies, suppliers themselves.

All together help to build a new research design tool, the iceberg, by building layers of the initial groups who can help, impact, influence to the supportive or unsupportive systems of the countries depending on scenarios of individual personas.

CHARRETTE PROCESS
*CHRONOLOGICAL IMAGE
DOCUMENTATION*

Day 1: Monday 26 September

Welcome and Introduction.

Day 2: Tuesday 27 September

Exercise 1
Team values group exercise. Discussion on our principles.

Exercise 2
Divide the team into small groups, introduce to the Agile and Project Management principles activity, explore further, share taken notes and have open team discussion.

Exercise 3
Brainstorming on the subject and relative keywords within
the entire team. Further discussion, sharing ideas, expanding topic.

Exercise 4
Individual research on the keywords, terminology, definitions and source. Exploring the subject. Small group discussion. Sharing with the entire team new information.

Exercise 5
Persona and Empathy activity. Introduction to the persona concept activity, creating individual personas based on the previous research, presenting to the entire team. Clustering similar personas, discussing and merging, exploring as a whole group new ideas, validating for
the next part.

Day 3: Wednesday 28 September

Exercise 1
Small group research in the library and online reflecting images on the insights so far and further discussion on it.

Exercise 2
Group activity and discussion on the values and principles of augmentation in the harmony of team values.

Exercise 3
Research and team discussion on the various policies, data privacy and communication within the user, supplier, and devices with each other.

Exercise 4
Stakeholders Ecosystems group activity based on the personas run by Dr Hilary Kenna.

Team discussion.

Day 4: Thursday 29 September

Exercise 1
Further continuation the Stakeholders Ecosystems by Katarzyna within a group.
The activity was based on the personas with a focus on the manufacturing, suppliers, tech companies, environmental organisation and impact, religious, moral, ethical and spiritual stakeholders. Further team discussion.

Exercise 2
The Iceberg structure and layers of systems depend on
the scenarios of each personas, within a positive and negative range of individual situations to explore and discuss the various possibilities and spectrum depending on the stakeholders, organisations, institutions, government bodies, private/public health sectors and insurance, suppliers, media, access etc. Finding links between the structure and layers and how they change depending on the persona's close relationship with stakeholders.

Chris's discussion and approval of the new type of research tool were created within the flow. Finding gaps within the negative vs positive situations and scenarios. Discussion within the team how similar personas could meet and if ever would be able to receive the same help based on their individual circumstances. Entire team discussion.

Exercise 3
Presentation - discussion on insights, content and choice of visual slides, introduction to digital presentation tool Slidesgo.

Day 5: Friday 30 September

Exercise 1
Divided into small groups for desire and need augmentation of the human body and mind by the drawing exercise. Individual drawings, group presentation and discussion.

Exercise 2
Work on the presentation and the presentation group practice.

Thesis Statements Proposal (Draft only for Charrette to Discover and Define)

3 types

Argumentative: The human augmentation technology will increase the level of the human body, physical and mental and its abilities and capabilities.

Explanatory/Expository: The invention of the human augmentation technology in the XIX century will allow humans to use their bodies, both mental and physical more efficiently even after damage.

Analytical: Although there are different methods of keeping a healthy, proactive and productive body physical and mental, such as a healthy diet, supplements, regular physical activity, medicine, surgery and medication, personal and professional growth, digital tools and devices, social relationship, hobbies, etc., the human augmentation technology is leading us to a new human beginning, Human 2.0. Are we ready?

Conclusion
I made a conclusion based on the valuable feedback, that I would like to focus on the current times and the near future within human augmentation technology innovations and trends, which is more accessible and not as restricted area as the smart prosthesis, due to ethics, accessibility to physicians and patients, timing etc.

Taking the feedback into account, I reframed the area of my thesis from posthumanism due to the naturally built-in bias, abstractive, the dystopian futuristic dehumanized world with cyborgs, hybrids, AI robots machines, etc.

Human augmentation technology might link to bionic bodies and posthumanism but from another angle.

Introduction
Subject Thesis.

Day 2: Tuesday 27 September

Phase 9

Our Team - Participants - Users

Contact Details

Demographics

Phase 10

Participants Availability

Phase 11

Let's have a bit of fun and know each other a bit better (depend on our timing and it is optional, you are more than welcome to do it in your spare time)

Onboarding
Time schedule and friendly activities.

Exercise 1
Team values group exercise.

Board 2

Phase 8 - Initial Design Research Method

The initial area of research will be reframed with time. Data collections first.
Let the findings unfold in front of us.

Research Area: Human, and Technology:
What is the current link between technology and the human body, physical and mental?
What is the next phase of it?
Are we ready for the next phase of the human body?

Data Collection: First Findings. 😊 **Chop it down.** 🔪 **Then Reframe it.** 😊
Find Terminology relative to technology in relation to our human body, physical and mental.
Provide the source.
Try to search for valuable resources, see examples:
Literature reviews: go for the formal sources; more books by recognisable authors; add more articles, interviews and documental movies with experts, leaders, and authorities; less recognisable online links in favour of official books, and articles.

Craft quotation - include author, the title of work, source/type- e.g. book/page or link to a valuable website within e.g. article, documental movie etc.

Introduction
To Design Strategy.

Exercise 2
The Agile and Project Management.

Exercise 3
Key words. Definition.
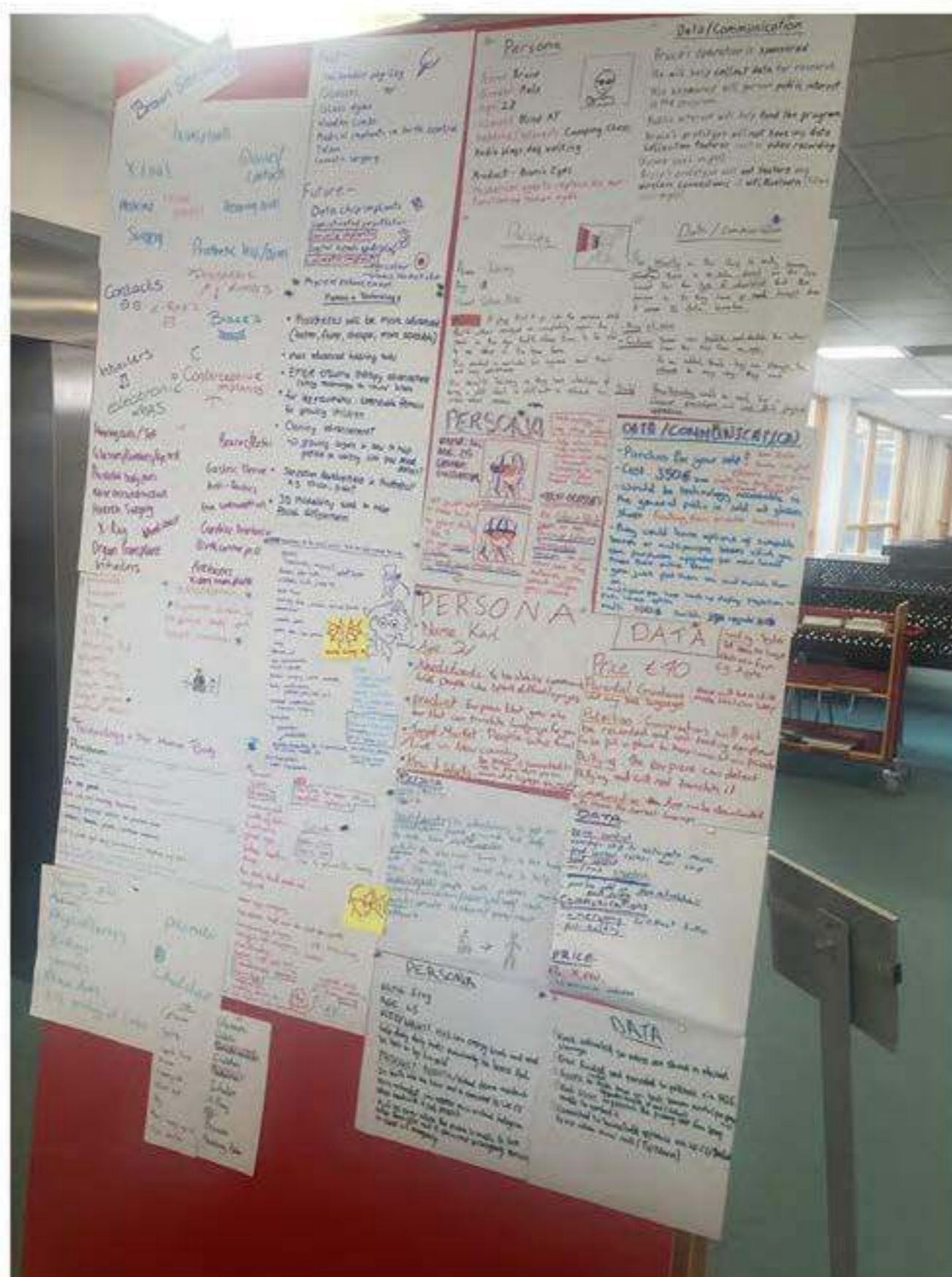
Exercise 4
Personas.

One Picture Speaks More then Thousands of Words

Phase 13 - Discovery

Data Collection: Visual References
Copy a Keyword from the above 1st Group (increase, growth, extension, making better, stronger, smarter) and add visual references, images, graphics etc.
Provide the source.

Data Collection: Visual References
Copy a Keyword from the above 2nd Group (fix-ups, repairs, heal human body) and add visual references, images, graphics etc.
Provide the source.

Exercise 1
Visual image references.

Exercise 2 and 3
Values and principles of augmentation.
Policies, data privacy, communication.

Day 3: Wednesday 28 September
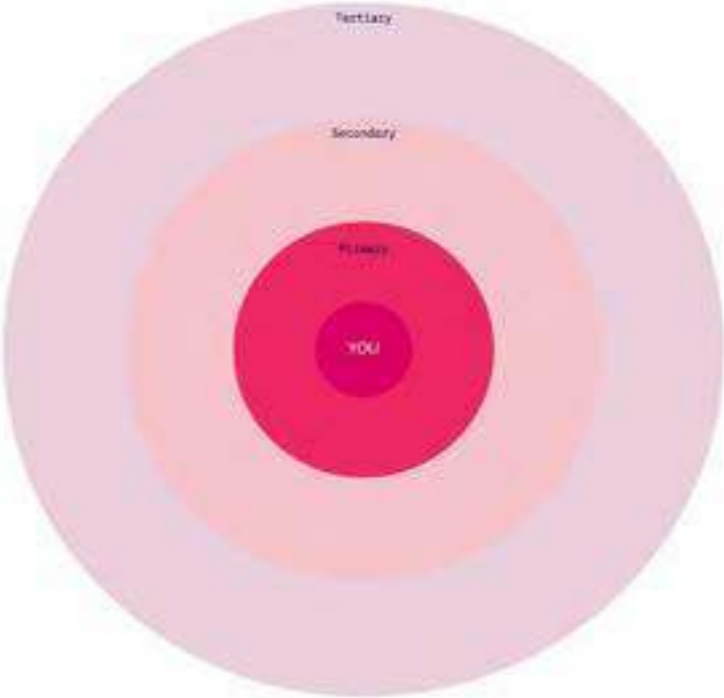
Exercise 4 (Wed) and 1 (Thurs)
Stakeholders Ecosystems.
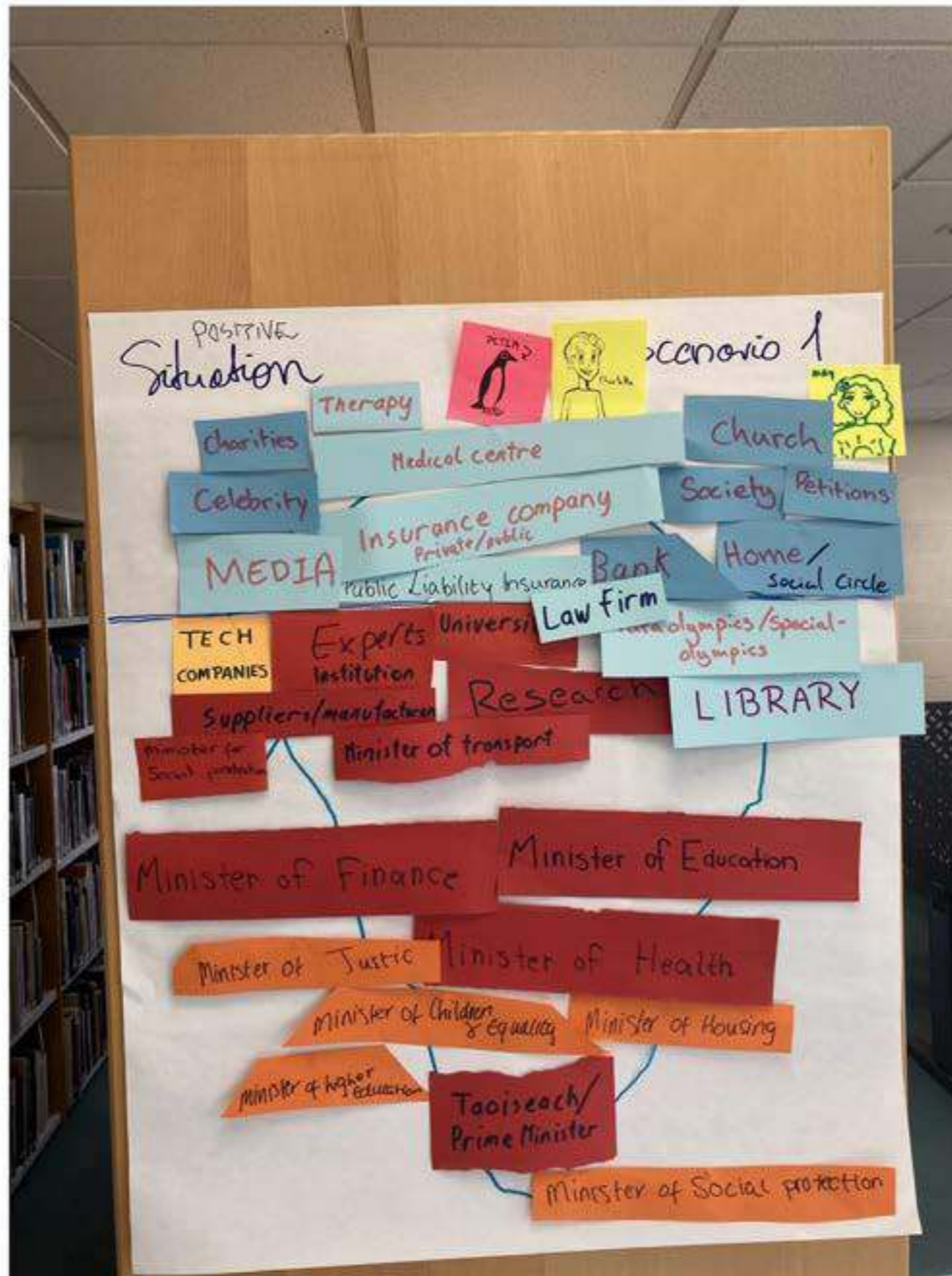
Exercise 2
Iceberg activity - Scenario 1.
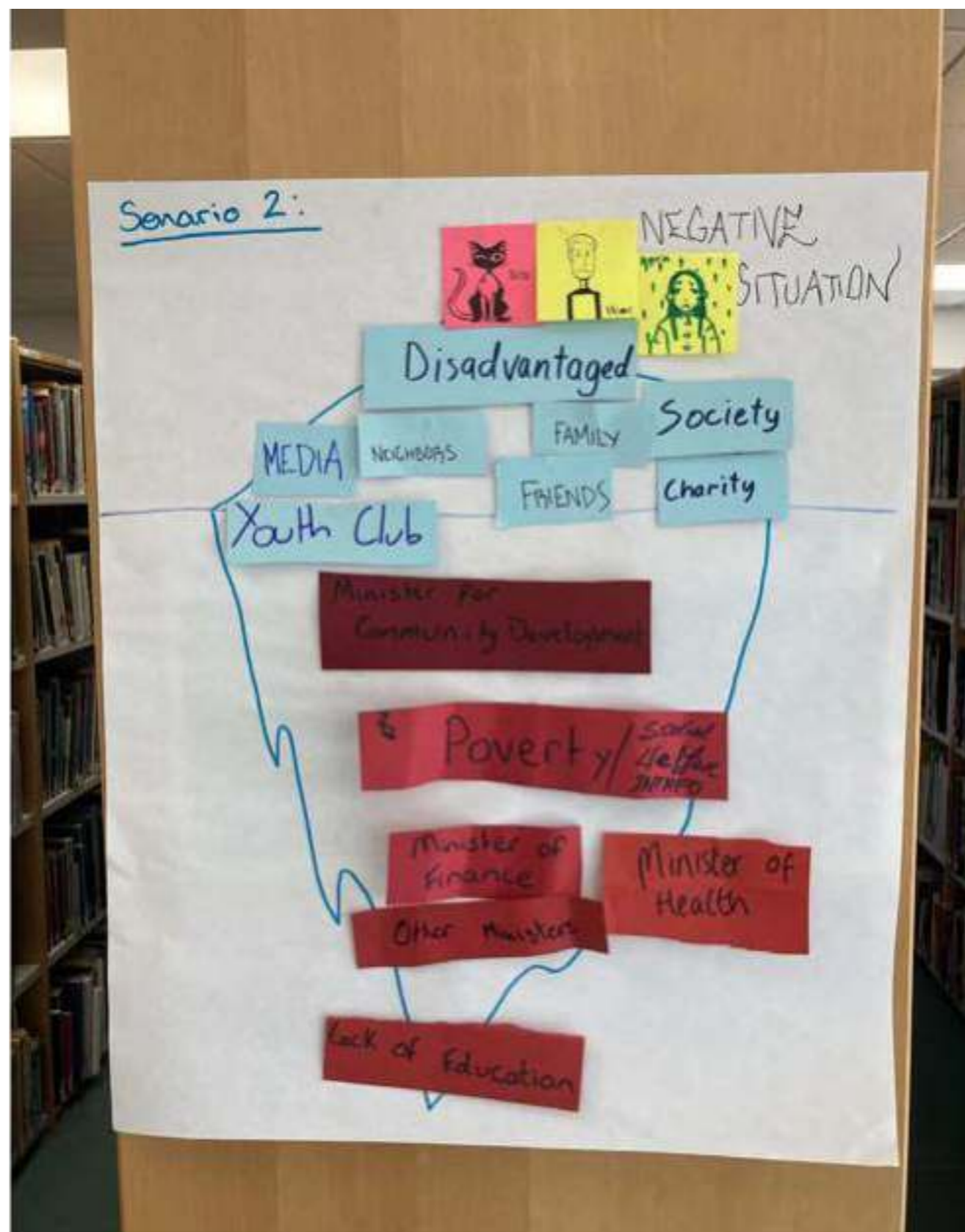
Exercise 2
Iceberg activity - Scenario 2.

Day 4: Thursday 29 September

Human Body Augmentation Artwork "Sunny"
By Keelin Kusch.
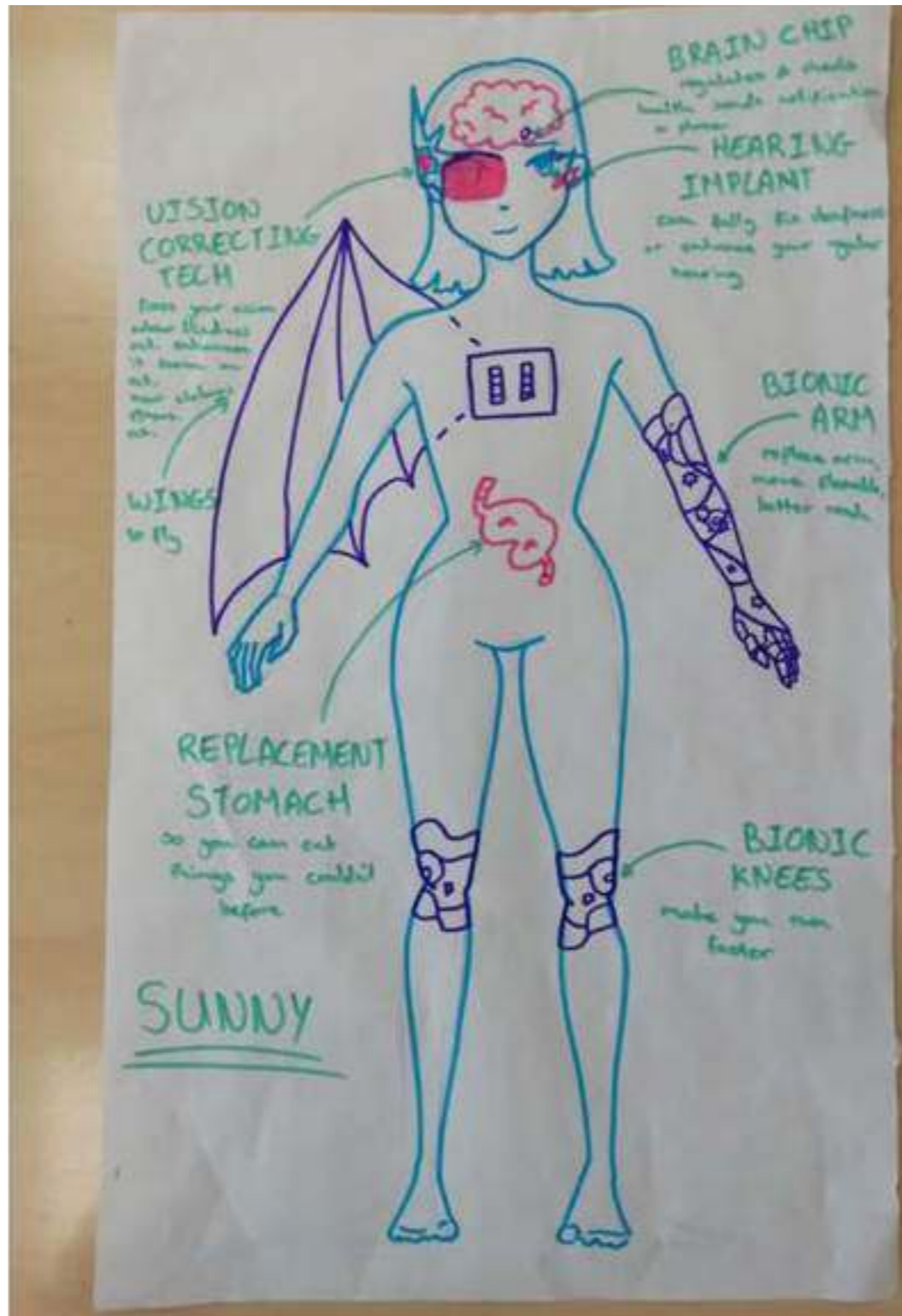
Human Body Augmentation Artwork "Alex"
By Aoife Obyrne.
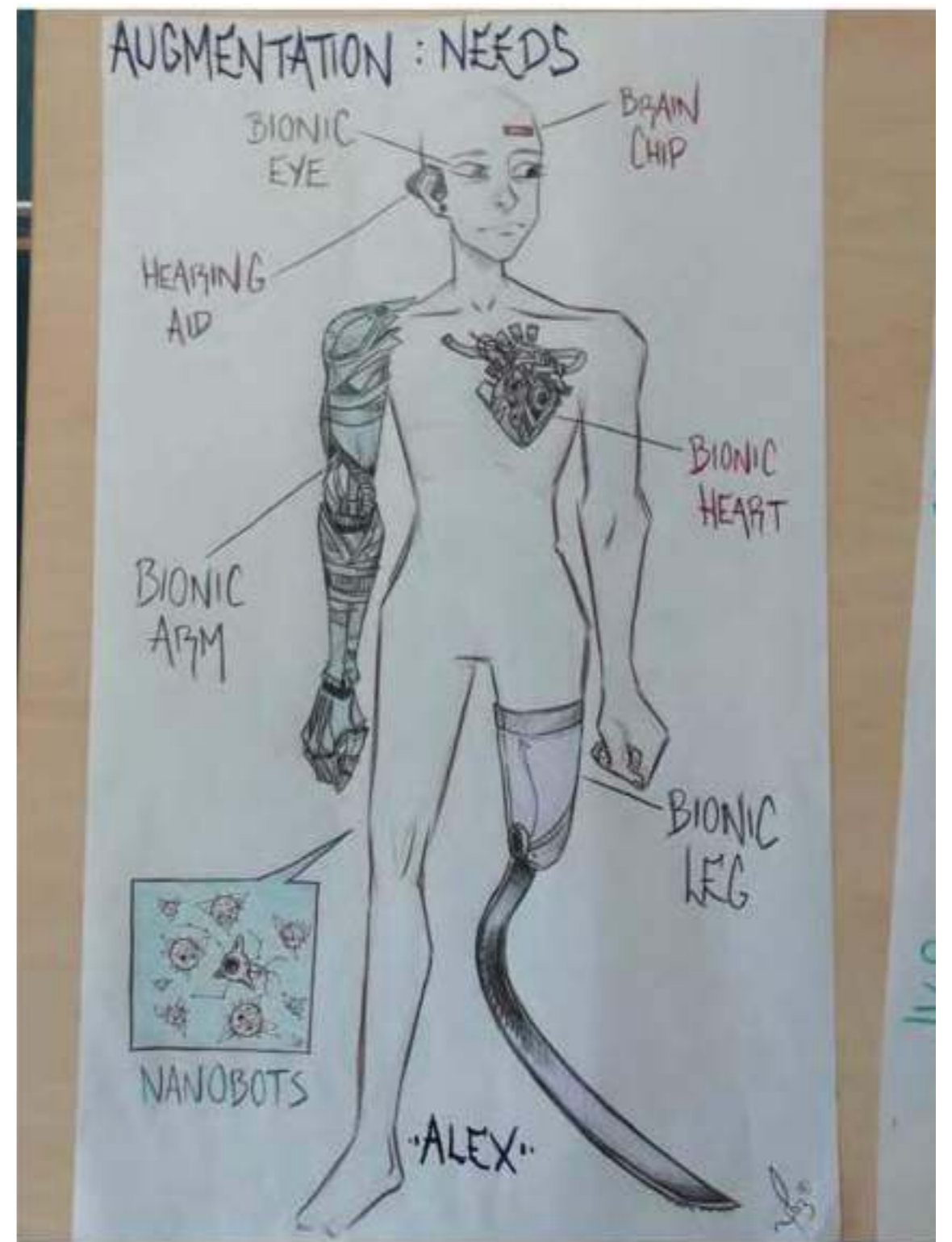
Human Body Augmentation Artwork "Jeremy"
By Thomas English.

Human Body Augmentation Artwork "Billy"
By Jordan Morris.
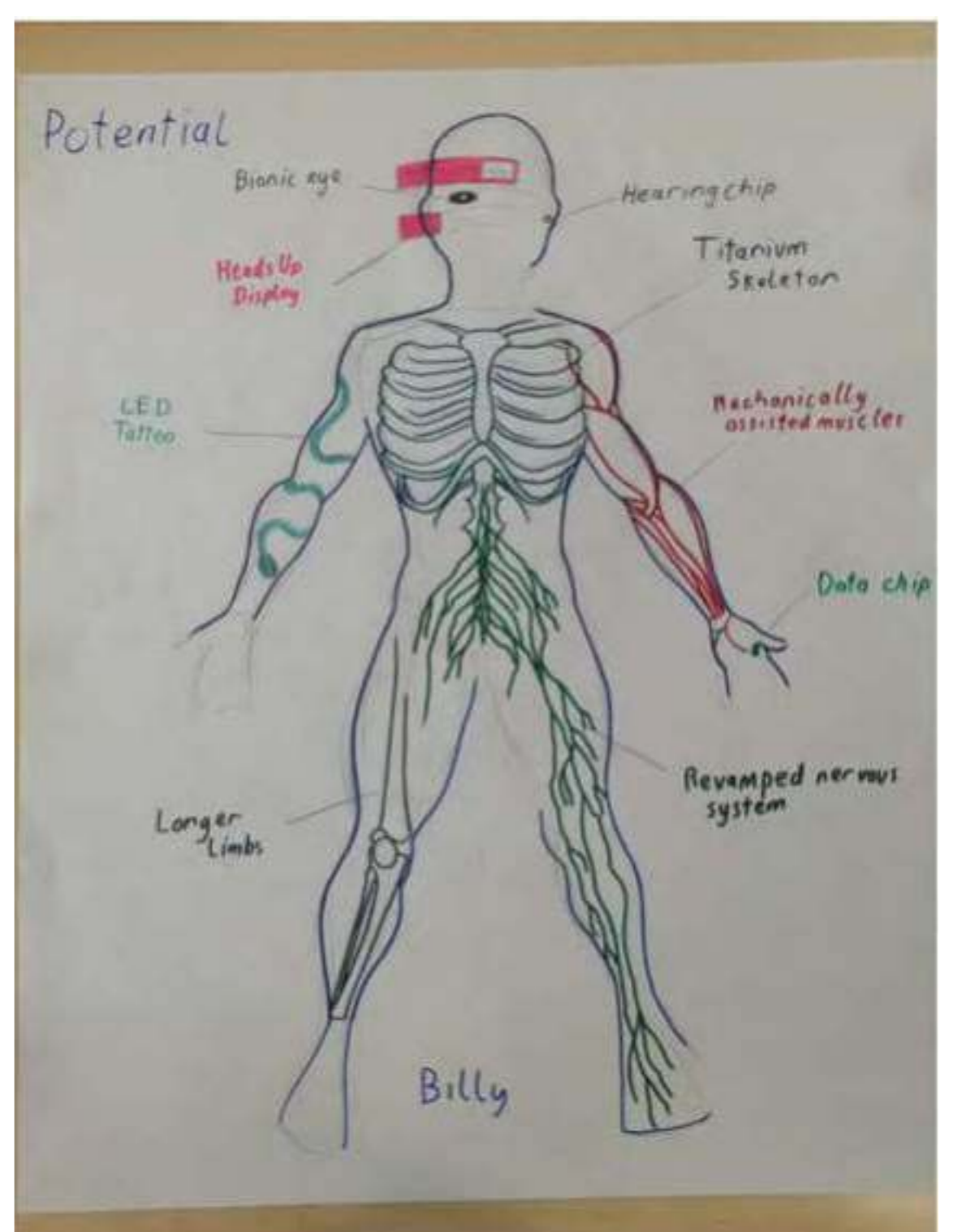
Day 5: Friday 30 September

CONCLUSION *REFLECTION ON CHARRETTE'S EXPERIENCE*

1. Charrete helped in understanding the subject closer, collecting the general public's points of view on the augmentation of the body and mind, and seeing the future of technology from various perspectives, from the device, and tool itself to a variety of personas, scenarios depending on the situations, while at the same time an importance of data privacy and communication.

2. Team was amazing, integrated, dedicated, had extraordinary points of view, and freely shared their thoughts while trying to step into the shoes of potential personas.

Group was truly engaged in a subject which help to collect individual mindsets on the topic as well as discussions within the entire group and actively listening and learning from observing and letting the team lead the next steps of research easily modifying depending on the needs, and goals of the team as well as the subject itself.

3. Implementing and focusing on the first phases of design thinking, discovery and then trying to define further the path towards the augmentation of the topic without looking for the solution truly help to dive into the topic and find out more than I could initially expect.

4. My perspective expanded because of the participants which I had found truly inspiring, motivating, and supportive. I did learn a lot from the workshop and close cooperation with my participants.

5. Collect positive and constructive feedback from all Advisors, Visitors and Participants and after Presentations will benefit future Charrette, workshops and seminars and help identify the Master's Thesis direction.

6. Establishing a closer Vision, Mission, and Goals for the Final Master's Thesis Research Design.

7. I truly enjoy the Charette and I am thankful for all work done together and received feedback which will help me in the thesis proposal. Experiences will as well benefit my professional work as a researcher and designer and will increase the potential of the future of a PhD.

8. Manual and digital tools such as whiteboard Miro were combined due to dedicated space and wi-fi connection. I needed to modify the initial Miro due to limited computers in the library, as well most participants didn't have own laptops or tablets. As well the wifi connection was not efficient on those personal devices.

Computers in the library are spread to distance apart which decreases the concentration. Because of that, I decided to do most exercises manually as it was easier to keep the group together and increase focus and collocation and calibration. Miro exercises were quickly converted using basic stationery suppliers, which worked very well in the end.

The next time, I would defiantly check the number of computer devices, dedicated space area, and an internet connection and in case print sheets for exercises instead of quickly preparing them on the go.

It is a great real-life workshop scenario lesson for the next time. However, the students still did a few exercises in Miro which will benefit their own future projects and I am glad that we combined two, manual and digital tools.

9. Final presentation was taking too long to do it together on Thursday and Friday. For the next time I will defiantly do it myself or with 1-2 participants only, which will maximise the potential of presentation from the visual aspect especially.

Most of the participants were truly dedicated. Some had their personal responsibilities which are totally understood. I am happy that so many participants were present at the final presentation and did part of the initial introduction to our topic of research. I am truly grateful for having so a wonderful team and being able to learn from all of them. Thank you.

CHARRETTE
PRESENTATION
30 SEPTEMBER 2022

Research Insights on the Human Augmentation

DISCOVER + DEFINE
DESIGN SPRINT

IADT Charrette 26-30 September 2022 Dublin

WE ARE CYBERPUNKS TEAM

Special Thanks to amazing Design Thinking Participants **Jordan, Aoife, Keelin, Thomas, Conor, Josh, Aaron, Vas, Abbi, Lauren, Christina, Bella, Billy, Sean and Katarzyna**

Many Thanks to all our Advisors and Organisers **Hilary, Robert, Stephen, Christopher, Shirley and Clyde**

HOW WE GET THERE? OUR FOCUS
THE DESIGN THINKING

Discover

Define

Follow The White Rabbit. Open as many doors.
Discover, where are those doors are going to take us.

01

POLARITIES

DISCOVERIES
VALUES
POLICIES
INSIGHTS

02

ECOSYSTEMS

INFLUENCE
AFFECTED
**STAKEHOLDERS &
VARIOUS PERSONAS**

03

ACCESSIBILITY

SURROUNDINGS
SCENARIOS
SERVICES & SYSTEMS
ICEBERG HIERARCHY

POLARITIES DISCOVERIES
and connection between them

NEED	●●●●○○○○	**DESIRE**
INTERNAL	○○○●●●●●	**EXTERNAL**
TEMPORARY	●●●●●○○○	**PERMANENT**
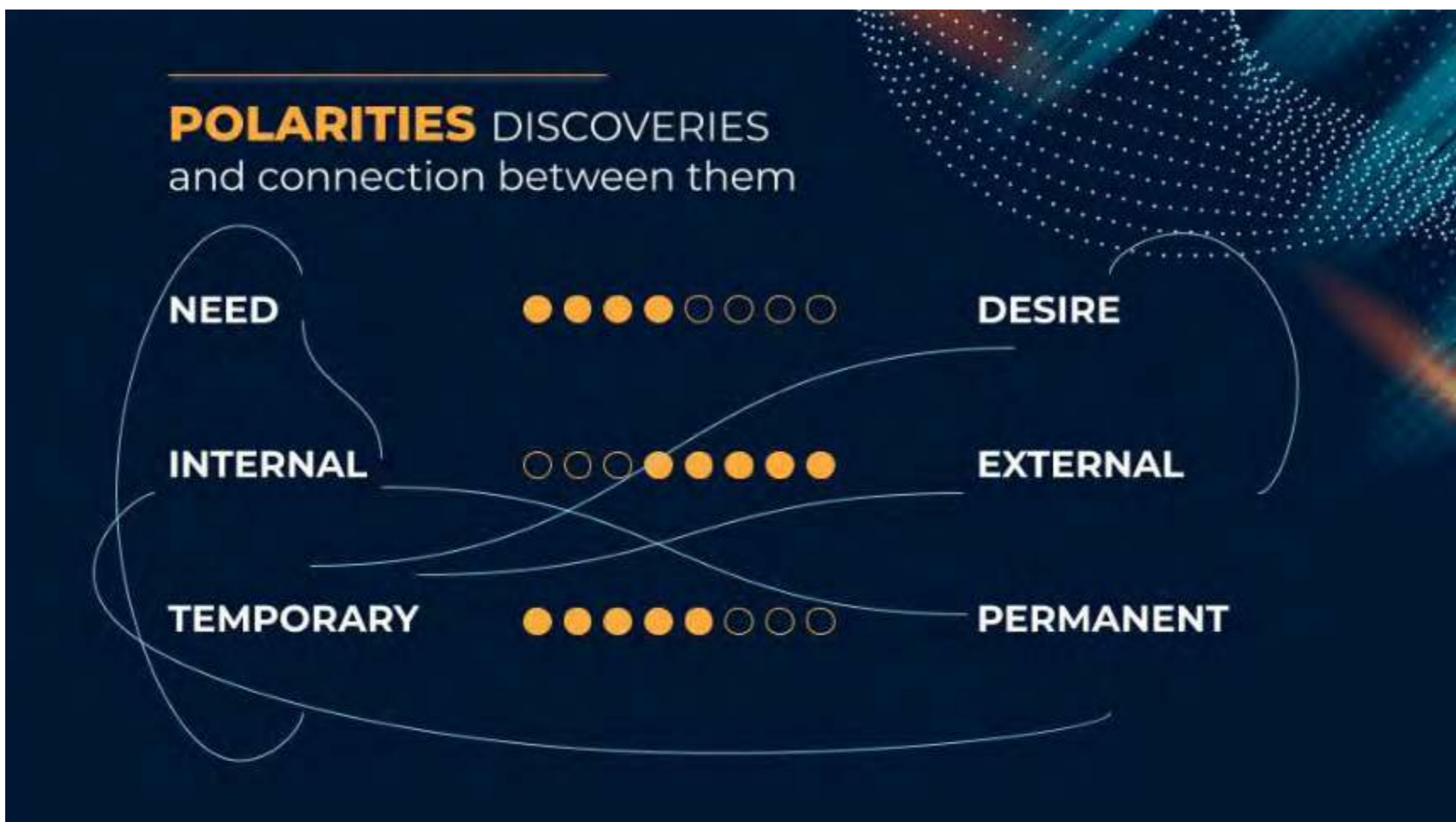
INTERESTING OBSERVATIONS & DISCOVERIES

NEEDS VS DESIRES OR BOTH

POLARITIES

Awareness Sensitivity Security Benefits

REGULATIONS AND POLICIES

DATA ●●●●●●●● **PERSONAL**

Who, Why, How, What, Where and How Long?

POLARITIES DISCOVERIES
connection between them

VALUES

TRUST ●●●●●●●● **SAFETY**

Achieved a broader sense and impact of the importance of understanding the process of design research who is affected, influenced by those who have power and control.

ECOSYSTEMS

INFLUENCE & AFFECTED

VARIOUS STAKEHOLDERS

DEPENDING ON

VARIOUS PERSONAS

ACCESSIBILITY

SURROUNDINGS & SCENARIOS

SERVICES & SYSTEMS

STAKEHOLDERS & PERSONAS

A TIMELINE

YESTERDAY

TOMORROW

TODAY

NEAR FUTURE

QUESTIONS AND ANSWERS

THANK YOU

We Use Digital Tools as Miro, Slidesgo
and Manual Tools e.g. Pen & Paper
in our Design Research.
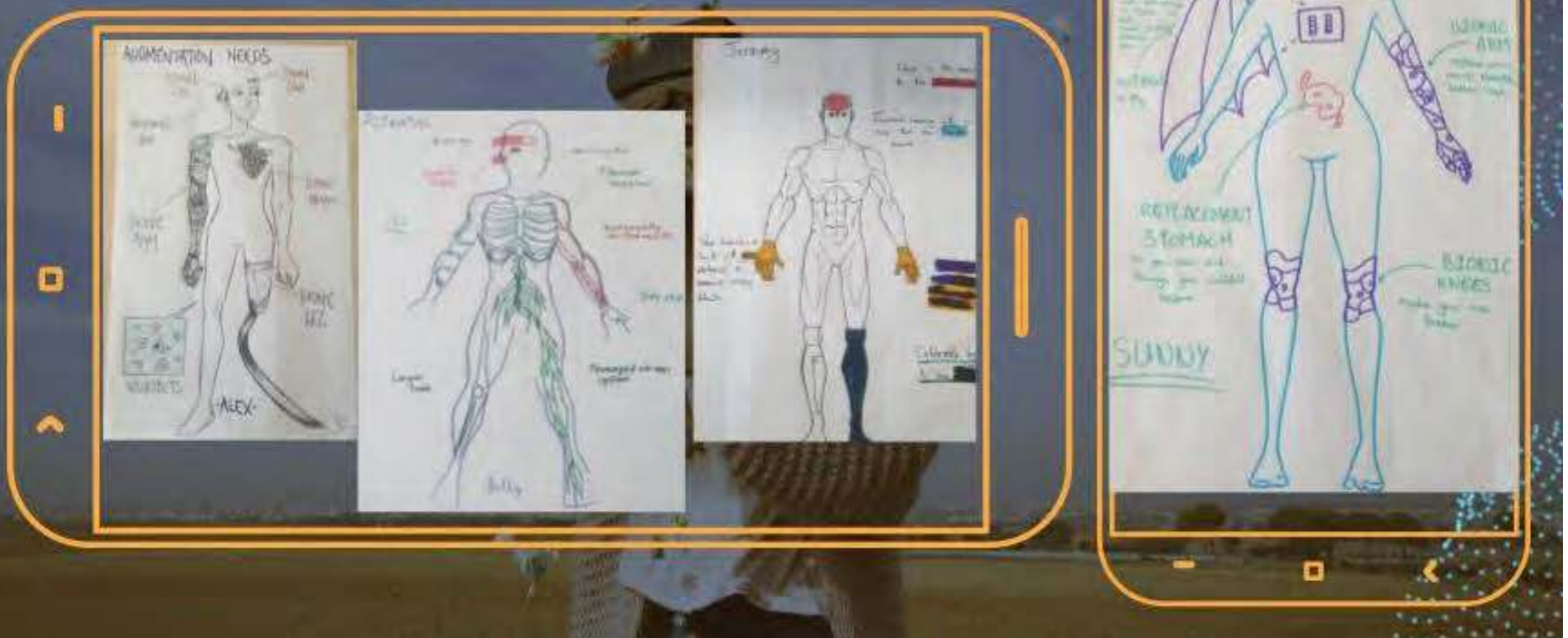
Artwork created by Animation Students.
Starting from left:
Aoife O'Byrne, Jordan Morris, Thomas English, Keelin Kusch.

ONLINE *SURVEY*

QUESTIONS & RESULTS

1. Select your age group:

18-49	135
50-65 or above	28

2. Select your gender:

Female	93
Male	66
Prefer not to say	3
Other	0

3. Where do you live?

Ireland	64
United Kingdom	6
European Union	52
Non-EU European countries	2
North America	30
South America	0
Africa	2
Asia	6
Australasia	1

4. Select any of the below, which relates to you. You can tick as many as appropriate.

I use corrective glasses/contact lenses.	100
I had or plan to have laser vision correction.	16
Cataract	3
Colour blindness	0
Floaters	10
Tunnel vision	0
Blind spots	1
Blurriness	5
Glaucoma	1
Muscular degeneration	1
Retinopathy	2
None	52
Other	5

5. Have you ever had an encounter (used it yourself, observed others using it) with any of the following? You can tick as many as appropriate.

Guide dogs	84
White canes	55
Phones with large tactical buttons	45
Large print materials	49
Text-to-speech system	73
Screen reading software	63
Footpath walking paths e.g. airports	56
Braille displays, prints	59
Talking devices	57
Thermostats	39
Reading time/date watches	33
Magnifiers	57
WC 3- website accessibility guidelines and principles	47
None	30
Other	1

6. Do you use any screen media devices for work/college/school? You can tick as many as appropriate.

Mobile phone	141
Tablet	65
Laptop	151
Desktop computer	75
E-reader (kindle etc.)	24
None. I do not use any digital screens at work/college/school.	4

7. How many hours per day do you spend using screen devices for work/college/school?

0-1hr	0
1-2hrs	2
2-3hrs	10
3-5hrs	8
5+ hours	39
8+ hours	90
12+ hours	9
None. I do not use any digital screens at work/college/school.	5

8. Do you use any screen media devices for personal use? You can tick as many as appropriate.

Mobile phone	158
Tablet	68
Laptop	143
Desktop computer	45
E-reader (kindle etc.)	43
None. I do not use any digital screens for personal use.	0

9. How many hours per day do you spend using screen devices for personal use?

0-1hr	9
1-2hrs	33
2-3hrs	55
3-5hrs	37
5+ hours	14
8+ hours	9
12+ hours	6
None. I do not use any digital screens for personal use.	0

10. Do you use a screen device first thing in the morning after waking up?

Not at all	11
Every day	88
A few times per week	42
A few times per month	6
Rarely	16

11. Do you use a screen device last thing at night before going to sleep?

Not at all	6
Every day	81
A few times per week	48
A few times per month	14
Rarely	14

12. How much time do you spend watching television daily (live TV or content on demand such as Netflix, Disney, Prime, players etc.)?

0-1hr	48
1-2hrs	61
2-3hrs	28
3-5hrs	5
5+ hours	3
8+ hours	3
12+ hours	0
I do not have/watch TV.	15

13. Have you experienced any of the following, while using, or following the use of, a screen device? You can tick as many as appropriate.

Dry eyes	78
Eyestrain	57
Double vision	13
Blurred vision	49
Redness	32
Irritation	50
Burning sensation	21
Tired eyes	115
No, I have not experience any of conditions.	34

14. Have you used any of the following to help with any of these symptoms? You can tick as many as appropriate.

Computer glasses	56
Lubricant eye drops	56
Proper lighting	49
Anti-glare filters	28
Ergonomic position	38
Regular breaks off the screen	63
Digital screen detox (few days break with no mobile, computer, TV etc.)	19
No, I have not used any even I have experienced some of conditions.	22
No, I have not used any as I have not experienced any of conditions.	26

15. Do you know what a Virtual Reality headset is?

Yes	143
No	20

16. Would you be willing to try a VR headset?

Yes	128
No	35

17. Have you ever used a VR headset, try out someone else's, a demo VR headset at a shop/event etc.?

Yes	91
No	72

18. Do you use a VR headset at work/college/school?

Yes	2
No	161

19. Do you own a VR headset and use at home?

Yes	7
No	156

20. How much time do you spend using a VR headset daily?

0-1hr	25
1-2hrs	0
2-3hrs	1
3-5hrs	1
5+ hours	0
8+ hours	0
12+ hours	0
No, I do not use a VR headset.	136

21. Have you experienced any of the following symptoms during or after using a VR headset? You can tick as many as appropriate.

|	
Dry eyes	7
Eyestrain	7
Double vision	4
Blurred vision	6
Redness	2
Irritation	5
Burning sensation	2
Tired eyes	12
Headache	14
Migraine	1
Insomnia	1
Discomfort	11
Heaviness	7
Pressure	6
Rash	0
Head and skin irritations	3
Raising body and head temperature	2
Excessive sweat	5
Long-lasting skin marks	4
Nausea	15
Motion sickness	24
No, I have not experience any of conditions.	17
No, as I do not use a VR headset.	108
Other	6

22. Have you continued to use a VR headset after experiencing the above conditions?

Yes, I continue as didn't know it is relative to VR.	1
Yes, I knew that might happen. I took a short break.	12
Yes, after reading Health and Safety Warnings.	0
Yes, I took break few days - weeks.	6
Yes, I gave up.	7
No, I have not experience any of conditions.	12
No, as I do not use a VR headset.	123

23. Have you plugged into the socket a VR headset to charge while using it at the same time?

Yes, often.	4
Yes, a few times, but I do not do it anymore.	3
No, never.	23
No, as I do not use a VR headset.	132

24. Have you ever fallen asleep with a VR headset?

Yes   2
No   28
No, as I do not use a VR headset.   132

25. Have you bumped into the wall, hurt yourself or broken anything in the house while using a VR headset?

Yes   6
No   27
No, as I do not use a VR headset.   129

26. Have you bought a VR headset for someone else as a gift?

Yes   10
No   153

27. If Yes, for who? (If Not, skip the question).

Adult   9
Child above 13 years old (at that time)   2
Child below 13 years (at that time)   1

28. Have you been aware that a VR headset is banned for children below 13 years old?

Yes   19
No   142

29. If you ever use a VR headset, rate your overall experiences with it. (If Not, skip the question).

Very satisfied   12
Somewhat satisfied   33
Neither satisfied nor dissatisfied   24
Somewhat dissatisfied   4
Very dissatisfied   5

30. How do you feel about Virtual Reality on a scale from 1 (the most negative - dislike it) to 5 (the most positive - like it)?

3.20 Average Rating

31. Do you know what AR glasses are?

Yes   102
No   61

32. Would you be willing to try AR glasses?

Yes   126
No   35

33. Have you ever used AR glasses, try out someone else's AR glasses, a demo of AR glasses at a shop/event etc.?

Yes   23
No   140

34. Do you use AR glasses at work/college/school?

Yes   1
No   160

35. Do you own AR glasses and use at home?

Yes   2
No   161

36. How much time do you spend using AR glasses daily?

0-1hr   6
1-2hrs 0
2-3hrs 0
3-5hrs 0
5+ hours   0
8+ hours   0
12+ hours   0
No, I do not use AR glasses.   155

37. Have you experienced any of the following symptoms during or after using AR glasses? You can tick as many as appropriate.

Dry eyes   2
Eyestrain   2
Double vision   2
Blurred vision   1
Redness   0
Irritation   0
Burning sensation   0
Tired eyes   2
Headache   3
Migraine   0
Insomnia   0
Discomfort   1
Heaviness   0
Pressure   1
Rash   0
Head and skin irritations   0
Raising body and head temperature   0
Excessive sweat   0
Long-lasting skin marks   0
Nausea   0
Motion sickness   0
No, I have not experience any of conditions.   4
No, I do not use AR glasses.   154

38. Have you continued to use AR glasses after experiencing the above conditions?

Yes, I continue as didn't know it is relative to AR.   1
Yes, I knew that might happen. I took a short break.   0
Yes, after reading Health and Safety Warnings.   0
Yes, I took break few days - weeks.   1
Yes, I gave up.   2
No, I have not experience any of conditions.   4
No, as I do not use AR glasses.   153

39. Have you bought AR glasses for someone else as a gift?

Yes   2
No   161

40. If Yes, for who? (If Not, skip the question).

Adult   4
Child above 13 years old (at that time)   0
Child below 13 years (at that time)   1

41. If you ever use AR glasses, rate your overall experiences with AR glasses. (If Not, skip the question).

Very satisfied   1
Somewhat satisfied   6
Neither satisfied nor dissatisfied   18
Somewhat dissatisfied   2
Very dissatisfied   3

42. How do you feel about AR glasses on a scale from 1 (the most negative - dislike it) to 5 (the most positive - like it)?

2.98 Average Rating

43. Have you ever been concerned about your eyesight or anyone in your household and digital screen technologies, VR headsets, AR glasses etc.?

Yes   74
No   85

44. If you or anyone in your household use (or wanted to try, buy, use somewhere else) a VR headset and/or AR glasses, have you or anyone in your household read fully the health and safety product policies and warnings before using it?

Yes, VR/AR are/were used and the health and safety product policies and warnings were read.   14
No, VR/AR are/were used but the health and safety product policies and warnings were not read.   26
No, as VR/AR were not used.   118

45. Are you willing to be contacted to discuss your answers in further detail?

Yes   43
No   118

46. If yes, please insert your email address below:

43 Responses

The survey was shared with results with a supervisor since the first participant took part in it. The survey questions and answers were reviewed with a supervisor.

Branching normally applied to survey questions if no and yes, it did not work on IADT MS Forms. regardless of trying to solve that it didn't work as in the standard private business accounts on MS Forms and others. Even if all the repetition questions, participants did engage to the end and not dropped out of the studies. This is another success and appreciation to all participants. There are small errors in answers e.g. AR as a gift and if yes for who, however, those little differences did not affect overall major results. The survey went successfully well with 163 participants and 43 who are willing to continue the research.

A/B PREFERENCES
PRACTICAL & ONLINE TESTING
CONSENT FORMS, PHOTOGRAPHS, RESULTS

PRACTICAL 1:1
IN PERSON TESTING

A/B Preferences Testing

Information Sheet + Consent Forms

Study Title: What are the awareness, attitudes and acceptance levels amongst the general public to vision augmentation technologies?

Purpose of the Research
This study aims to research about awareness, attitudes and acceptance levels amongst the general public to vision augmentation technologies. This A/B test is for purpose of usage of digital screen devices.

Invitation
As part of your willingness you have been put forward to participate in this Solution Products Design Proposal Testing.

It is important for you to understand why this research is being done and what it will involve. Please take time to read this information carefully and discuss it with researcher and ask if theer is anything that is unclear or if you would like more information.

Do I have to take part?
You are free to decide whether you wish to take part or not. If you do decide to take part you will be asked to sign two consent forms, one is for you to keep and the other is for our records. You are free to withdraw from this study at any time.

If I take part, what do I have to do?
The study activities will take approx 30 minutes to 1h in total. All the activities take place at your home as agreed.

What are the benefits (if any) of taking part?
The main benefit of participation in this project is track own digital screen devices daily usage.

What are the disadvantages and risks (if any) of taking part?
There are no disadvantages to taking part.

How will information about me be used?
(e.g. The data collected will be anonymised and stored for 5 years)

Who will have access to information about me?
(e.g. Only the researcher listed and their research supervisor(s) will have access to the resulting data and workshop materials. The data will be stored on an encrypted computer will not be identifiable, i.e. unlinked-anonymous. The materials will be stored at the researcher's studio under lock and key. The data and materials generated will be retained for 5 years).

What will happen to the results of the study?
The results of this study may be used in IADT, public domain, health sector, tech companies etc.

Who has reviewed the study?
This study has been approved by the IADT MA Design for Change Supervisor.

What if there is a problem?
If you have a concern about any aspect of this study, you may wish to speak to the researcher who will do their best to answer your questions. You should contact them at phone number 0871640071 or by below email.

Contact for further information
For any queries of if you require any further information please contact k.hasnik@gmail.com

A/B Preferences Testing
Informative Sheet and Consent Form

Thank you
Thank you again for your time, it is much appreciated, and will hopefully contribute to better understanding which Solution Products Design Proposal will be more effective.

Date

4 th of January 2023

CONSENT FORM

Title of Project: What are the awareness, attitudes and acceptance levels amongst the general public to vision augmentation technologies?
Name of Researcher: Katarzyna Hasnik

Please tick box

1 I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions. ✓

2 I understand that my participation will contribute to my core programme but that I am free to withdraw at any time. ✓

3 I agree to take part in this study. ✓

4 I understand that data collected about me during this study will be anonymised before it is submitted for publication. ✓

5 I agree to the activities being video recorded and photographed* ✓

6 I agree to allow the data collected to be used for future research projects. ✓

7 I agree to be contacted about possible participation in future research projects. ✓

MURROUGH OBRIEN   4/1/23   m K. O8n
Name of participant   Date   Signature

Katarzyna Hasnik   4/01/2023   Katarzyna Hasnik
Researcher   Date   Signature

*please delete as appropriate

CONSENT FORM
(for use of quotes)

Title of Project: What are the awareness, attitudes and acceptance levels amongst the general public to vision augmentation technologies?
Name of Researcher: Katarzyna Hasnik

Please tick box

1 I agree for any quotes to be used ✓

2 I don't want any quotes to be used ☐

3 I want to see any proposed quotes before making a decision ☐

MURROUGH OBRIEN   4/1/23   m. K O8n
Name of participant   Date   Signature

KATARZYNA HASNIK   04/01/2023   Katarzyna Hasnik
Researcher   Date   Signature

Information Sheet and Consent Form – MA Design for Change

Track Your Time
by Colourful Pixel

Legend
Decide the colours for amount of hours spent on devices. Use colourful markers or pencils.

Colour	Hours	Icon	Device
	0-1 hour		TV
	1-2 hours		M
	2-4 hours		L
	4-8 hours		D
	8-10 hours		
	10-12 hours		
	12-14 hours		
	14+ hours		

I, EYE

The Pixel Tracker

small CHANGES
big RESULTS

My Eyes are the colour of...

My relatives' eyes are the colour of...

highlight, write or draw and have a fun

	My eyes	My relatives' eyes
BROWN		
BLUE		
GREEN		FATHER
AMBER		
GREY		
HAZEL		

What my eyes...

do on each device?

How much time
on devices
until become crime
for my eyes?
Because they become literally a dime
This is not a grime
but I need to get a herbal thyme
to properly let them rest
and do scroll less
No more social media mess...
Let's play chess
On the real board.
Btw, you really look good in this dress!
Thank you, Ches.
You are welcome my Bess.
Wow! this is so tasty cress.
You eat a lot, leave a bit for Tess.
Hey, this is called fress!
Yes! Yes!
I feel alive.
I feel like I came out of the mine.
I have to get over this online stress.
I can do this change.
It is in my range.
Be my own lord.
Oh yeah, the bless!

Device	
TV	✓ EACH DAY
Mobile phone	EACH DAY ✓
Laptop	VERY SELDOM
Desktop computer	VERY SELDOM
Tablet	✓
E-reader	N/A
VR headset	N/A
AR glasses	N/A
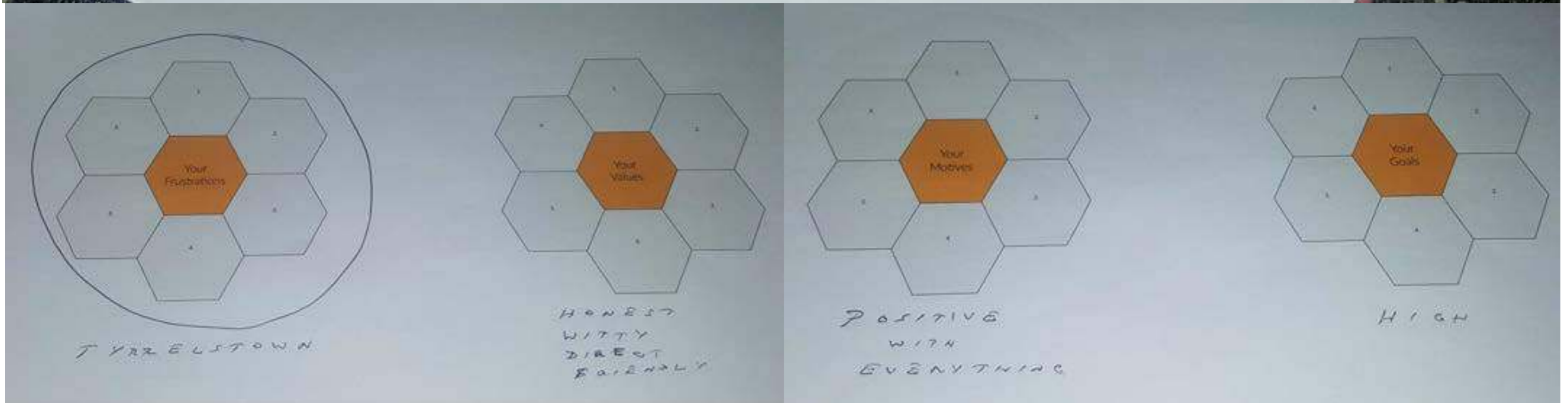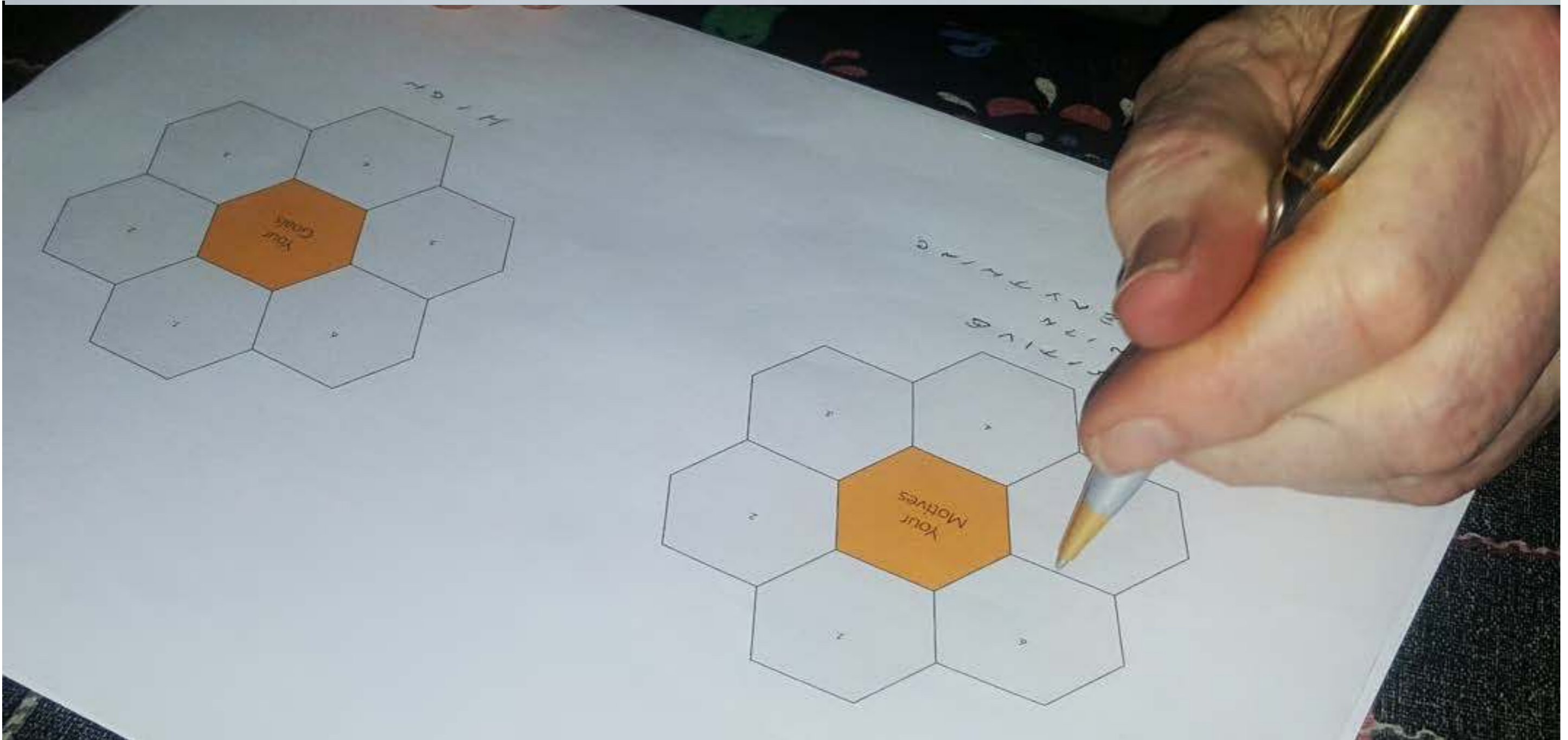
TYRELSTOWN

HONEST
WITTY
DIRECT
FRIENDLY

POSITIVE
WITH
EVERYTHING

HIGH

Doodle or Write a Poem

about Your Eyes

I, EYE

I SPY
WITH MY LITTLE EYE
Ⓒ

Day 1 — Device Screen Digital Tracker

How many minutes/hours altogether?
8 → 10
Smart goals

Rate your achievement
★★★★★
Self-reflection

Next steps

	Personal device usage	Professional device usage
Awake and Morning	30 mins	X
Afternoon	6 hrs TV	
Evening	4 hrs TV	
Night and Bed Time	—	

LESS TV MORE EXERCISE | HAVE TO MANAGE TIME BETTER | SET A TIMETABLE

Day 2 — Device Screen Digital Tracker

How many minutes/hours altogether?
10 — 12
Smart goals

Rate your achievement
★★★★★
Self-reflection

Next steps

	Personal device usage	Profession
Awake and Morning	TV 2 hrs	
Afternoon	TV 4 hrs	
Evening	TV 5 hrs	
Night and Bed Time	TV 1 hr	

REDUCE ASSESS | MANAGE TIME BETTER | IMPROVE

Thank you Mr. Murrough O'Brian for
taking part in this product user testing!

Day 3 — Device Screen Digital Tracker

How many minutes/hours altogether?
8 - 12

Rate your achievement
★★★★★

	Personal device usage	Professional device usage
Awake and Morning	2 HRS TV	
Afternoon	TV 3 HRS	
Evening	TV 4 HRS	
Night and Bed Time	TV 2 HRS	

Smart goals
REDUCE
ASSESS

Self-reflection
MANAGE
TIME
BETTER

Next steps
IMPROVE

Day 4 — Device Screen Digital Tracker

How many minutes/hours altogether?
1 HR

Rate your achievement
★★★★★

	Personal device usage	Professional device usage
Awake and Morning	1 HR MORN	
Afternoon	—	
Evening	—	
Night and Bed Time	—	

Smart goals
EXERCISE
SOCIAL,

Self-reflection
EXCELLENT
DAY,

Next steps
WALK
TREADMILL

Time for your new ideas! How can you maintain what you achieve and improve even better your lifestyle to achieve your future goals?

WAY OF LIFE
MONG HEALTHY
LIFESTYLE
16 - 20

Time for Weekly Reflection and Calculation

Final Monthly Results	Your Thoughts	Next Steps
16 - 20	TOO MUCH	MORE
2 DAYS	TV	MOBILITY
10 - 12	BORED	
01	MORE BUS	
	TRIPS	

Time for smile!

What are you grateful for?
LIFE

The reward for achieving goals

summer
time
is
coming

Maybe it is time for good and new sunglasses...?

sunglasses with this coupon Hasnik2023.*
local retail shops or shop online at www.trendnama.com

pamper yourself :-)

How would you like to reward yourself?

Idea No 1.	Idea No 2.
TARGET	

Have a look at both PDFs (sent by email, Slack, LinkedIn etc.).
Each has the same purpose: to track how much time we spend on
digital screen devices. Choose which you like more, easier to do
etc. Please share your thoughts, comments, and constructive
feedback.

Click an option to review it

ONLINE *TESTING*
RESULTS
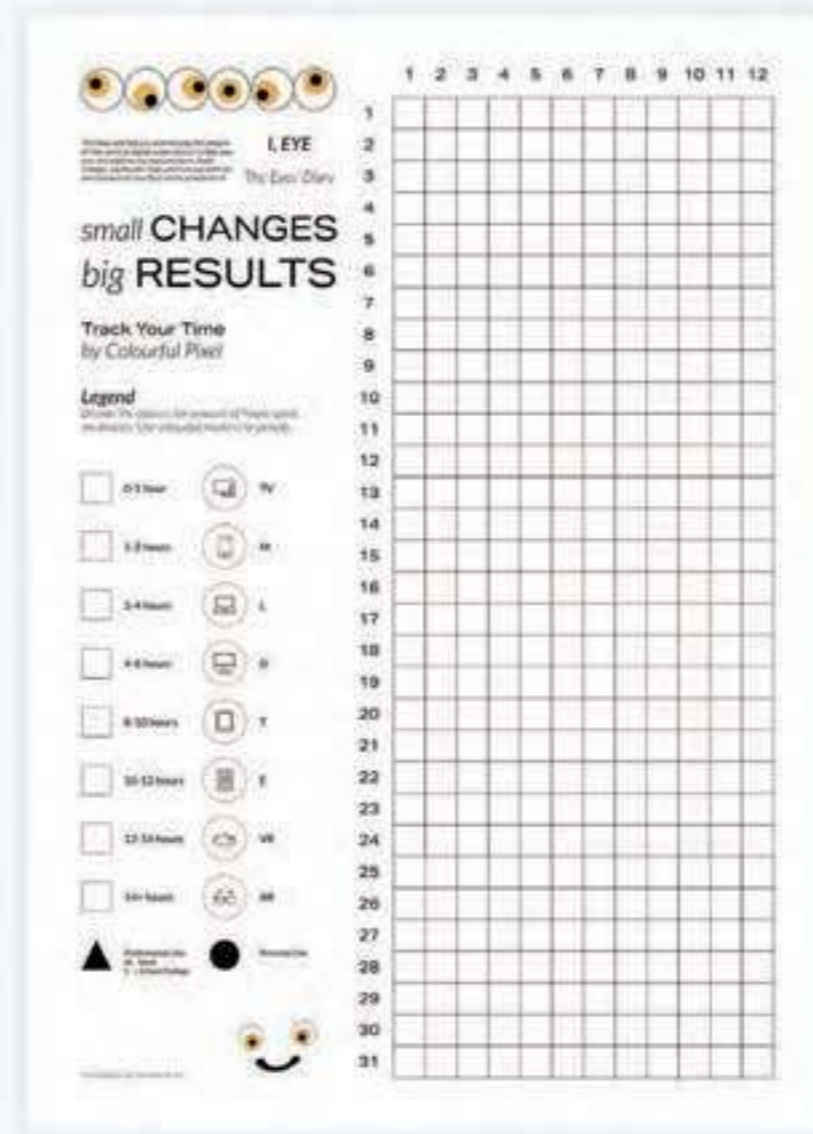
6	**6**		
Total participants	Responses shown	Share	🔒Export 6 results as CSV

♥ 1. Preference test

Have a look at both PDFs (sent by email, Slack, LinkedIn etc.). Each has the same purpose: to track how much time we spend on digital screen devices. Choose which you like more, easier to do etc. Please share your thoughts, comments, and constructive feedback.

	IADT_MA_DFC_Solution Product Design Proposal_v1_A.png	18s	50%	👤 3	▼

	IADT_MA_DFC_Solution Product Design Proposal_v1_B-01.png	33s	50%	👤 3	▼

A 1a. Short text question

Which design do you prefer?

≡ Answers 6   🏷 Tags 0   ☁ Word cloud

☐ Select all   🔍 Search responses   Add/edit tags

☐ Prefer the grid layout for ease of understanding and clarity

☐ This has more direction and is something very easy to complete without help. I think this will be easier to track data with all users.

☐ Not overwhelming

☐ the second one

☐ I like both. This one is more fun.

☐ 365 days overview. I used Pixel App. It helps.

NEXT *STEPS*

NEAR FUTURE

PRODUCTS DESIGN PROPOSAL

First, the next steps will be to test more of the two solution products' design proposals, The Eyes' Diary and The Pixel Tracker in practical testing to which I am looking forward. After that iterate and test again.

The Product Design proposal of several various ideas came as the results of primary research and secondary research outcomes would be the next step which will include the phase of actual design, test and prototype and again test based on the Design Thinking strategy. The aim would be to interview the participants and experts and find the best possible product and/or service by aiming for inclusive design for both vision-impaired people and the general public.

Human Centred Design would be applied including testing would involve vision-impaired general people by aiming for accessibility in both digital and print products as well as services, educational workshops dedicated to a general audience and vision-impaired people as well as design workshops for government organisations and sectors and tech companies.

There are plenty of possibilities for the actual design of the product and/or service from the area of research based on the valuable outcomes and findings by taking into account public voice and opinions while at the same time taking into account data from secondary research.

The mission, goals, personal and project aims and objectives, and values established within Charrette workshops as well as personal and professional do build the foundation for the potential product and service.

The major direction of potential products and services is to help, support, inform, educate, communicate, inspire and motivate to knowledge about eyesight, and important factors of vision assistive technologies while at the same time preventing possible partial or full vision loss by increasing public awareness about excessive exposition to digital devices, health and safety warning about VR and mainly by establishing healthy habits, limited time, breaks, digital detox etc. to prevent than act on it when the computer vision syndrome does happen or other vision eyesight defection, which could be prevented, postponed or minimise. To positively establish a relationship between the public and the visually impaired people by aiming for inclusive design for all and to establish a communication dialogue between both parties to influence positively each side.

FIRST POTENTIAL PRODUCT AND SERVICE
FOR THE GENERAL PUBLIC AND VISUALLY IMPAIRED

INFORMATIVE WEBSITE/MOBILE APP within W3C Web Accessibility Initiative (WAI) guidelines to aim for inclusive design, which includes not only formation about eyesight, variety of vision partial or full loss, disabilities, eye tests recommendation frequent, colour blindness tests, assistive technologies, policies, disability acts, erasing the myths but enables the communication between the general public and visually impaired people through open forums, shared stories, chat, video phone calls, email communication, community local, national and international social activities, charity events. This type of platform will educate, help, support and motivate all to get to know each other better and even do create new opportunities for friendships, an inclusive school, and a work environment, where products for visually impaired people could be exposed to the public and even tested on the events what will establish a new level of understanding and empathy.

The website could as well include potential investors, and areas of innovative current scientific, medical and technological research to reduce blindness and bring vision back as eye bionic eye-brain implants or seeing colours through hearing sound waves by directly attached antenna within the brain for those fully colour blind as already is in usage by first cyborg Neil Harbisson. The website could be part of the health sector across EU countries through close cooperation by aiming for consistent updates, expert interviews, articles and open donation funding by the public, non-profit organisations and for-profit companies.

The platform as well will be promoted in print materials, both standard and large size and within Braille to aim for an inclusive and diverse design. User testing will be done both with visually impaired people and the public to aim for the best product following the accessibility design aims and government regulations.

The timeline of the history of augmentation technologies of eyesight could bring an interesting part of it. Braille courses could be

provided for the general public to learn a new language and the differences within Braille across the world depend on the country.

SECOND POTENTIAL PRODUCT AND SERVICE
FOR THE GENERAL PUBLIC MOSTLY AND VISUALLY IMPAIRED WHO CAN STILL SEE TO USE VR AND AR

INFORMATIVE WEBSITE/ MOBILE APP/ ONLINE AND PRINT MAGAZINE about the screens of digital devices, a variety of it, including basic information about the history of development as well as aiming to inform the public about Virtual Reality and Augemnation Reality, the differences, history, failure and potential while taking aspect of health and eyesight into account by promoting healthy good balance usage of it for those who are interested in. Additional health, and safety policies and warnings, frequently asked questions, forums, expertise articles, academic research new findings and upcoming emerging innovative technologies such as smart contact AR lenses by Mojo Vision etc. Including aspects of the 1st idea as well.

THIRD POTENTIAL DESIGN PRODUCT
FOR THE GENERAL PUBLIC AND VISUALLY IMPAIRED (Large Print Format, Braille etc.)

THE STORYTELLING AND PERSONAL DAIRY
It could be "I, eye" which in English sounds the same.
The I, EYE will be the own character in the storytelling with a variety of styles of illustrations depending oneth the audience, adults and children audiences.

The personalised EYE as a person will be a storyteller while at the same time giving space to a personal diary to help own eyes see better and rest by taking care of them daily by writing notes in an actual paper notebook instead of the commonly many wellness mobile apps. Information about eyesight among family relatives could be included, recommended healthy advice by the health sector, how the brain and eyes do see, including the information about visual differences across the animal kingdom and humans, timeline history of vision technologies or just space to reflect on eyes, including more abstract forms of what interesting was seen today or what imagination could see without the use of the eye. There could be a space to draw and to write and express

feelings, dreams and thoughts. This could be in form of a paper-recommended notebook however for those who wish to get a mobile app has more interaction within the product the Voice interface will be promoted more than Vison Infarce would be the main User Interface to help eyes rest.

Mobile App could be linked to Smart Watch and other digital devices including TV to inform users about the amount of time spent in front of the screens. Recommended breaks could be sent while giving positive tips to establish healthy habits and prevent any eyesight difficulties which are possibly prevented by acting responsibly.

FOURTH POTENTIAL DESIGN PRODUCT
FOR THE GENERAL PUBLIC AND VISUALLY IMPAIRED

THE BOOK and AUDIOBOOK
This could be a book and audiobook with all the above information as in all listed design ideas.

FIFTH POTENTIAL DESIGN PRODUCT AND SERVICE
FOR THE DESIGNERS AND TECH COMPANIES
EDUCATIONAL AND DESIGN WORKSHOPS
To provide educational and design workshops for-profit sector, tech companies, across big giants to startups in Ireland and beyond dedicated to all stakeholders and shareholders as listed but not limited to accessibility designers, UX researchers, UX/UI designers, web designers, developers, project managers, product owners, investors, and managers, directors to design accessible websites and mobile application including visually impaired people websites and mobile apps.

The aim is that the number of privately owned digital products will be accessible for visually impaired people and it will be as high as in the public sector as per shared information in the Inclusive Accessibility Labs, Digital Accessibility Index 2022 and as per government regulations and laws. Inclusion Accessibility Labs could be potential clients of the product and services described above or a new career opportunity position. This could potentially open a door for new Irish and EU disability policies.

This could as well be spread to non-digital products for example packaging design to be more inclusive and visually impaired friendly.

FURTHER RESEARCH

This research opens the potential for PhD studies proposal as recommended by my promotor. Within the possibility of going further within the research, a few steps could be established:

FIRST POTENTIAL RESEARCH

The next beneficial step in further research would be to contact the participants of the survey directly, those who shared their contact details and replied yes to the question:

43 participants out of 163 say yes, which is approx 1/4 of the entire number. It is a great number of participants who are willing to take part in the focus group workshops or 1:1 interviews or additional surveys, quantitate and quantitive data. By investigating data, those participants do have things in common but as well they do reply to certain questions differently including basic demographic questions and as well questions about their eyesight.

Focus group activities could create opportunities to investigate the subject on a much deeper level, by evaluating their opinions and behaviours for example Empathy Exercise followed by improvising the corrective glasses, and white canes, covering the eye with a blindfold etc.

This could be done in a group or individually in own time and shared experiences in the group, most likely online due to the various locations of participants. Certain participants who are willing to be part of further research are located in Ireland which brings the opportunity to meet in person and run together in person.

SECOND POTENTIAL RESEARCH

In the beginning, the 1st draft of the survey did include questions similar to the same asked but about the other people in the same household and their awareness, and attitudes about vision augmentation technologies. However, to aim for clarity and within time constraints to keep the survey short under 7-9 minutes, the questions about family members were excluded.

Going further with the ethics approval as part of the PhD it will be good to ask the same first survey participants about their relatives, people in the same household, including children, if any and their eyesight and relationship with vision augmentative technologies. It will be beneficial to ask if, for example, children or spouses, partners or family members, or relatives do bring any restrictions to using mobile devices, tablets, TV, or computers when they together gather at the table by having family meals, or outdoor spending quality time in nature, or fine dining in the restaurants or visiting friends, families. If mobile devices are prohibited from bedrooms both adults and children maintain the rest from screens as well as aim for privacy, quality sleep time, and intimacy.

Separate questions could revalue the relationship between hard copy books and e-readers, e.g Kindle and the reason why is chosen. If the lighting at bedtime is disturbing the spouse, and the partner has changed to fall asleep what can be done about it? Helping people with their wellness by increasing awareness about digital devices' impact on the eyes could be one of the potential aspects of promoting reading hard copy books in other settings, times or rooms and even potentially influencing better outcomes for both partners.

THIRD POTENTIAL RESEARCH

It will be conducted through interviews with open and closed questions as well as quantified and qualitative surveys with Experts from non-profit organisations, for example, the National Council for Blindness in Ireland or HSE, opticians, and doctors to investigate their opinions on the subject itself, and the findings of the primary research across the general public.

It will also be beneficial to treat them as public and do ask them to answer the same questions to see what are their opinions, feelings, and behaviours towards the usage of digital screens, and augmentation technologies, especially for the purpose of desire, and entertainment. It will really interesting to see their daily exposition on screens and respond to any computer vision syndrome.

Also, it will be important to ask what is done now to increase public awareness about eyesight, potential harm, and health and safety warnings, and what kind of policies are forced currently on digital devices, VR, and AR producers if any.

It will be beneficial to share the data and bring support to the National Council for Blindness in Ireland to erase the list of their website myths about visually impaired people by proposing the potential solution described in the Outcomes while reevaluating the insights.

Conducted further research studies could take into account staff policies from usage or non-usage of VR and AR in the work placement and the rights and protection of employees to refuse to do so.

While at the same time interview and surveys with the for-profit companies which produce digital devices such as mobiles, tablets, e-readers desktop computers, laptops, VR and AR will be good to conduct to see their points of view on the global WHO statistics about the rapidly growing eyesight vision partial loss due to natural major aspects as ageing versus exposition of users on the digital screens often without the limit because actually the limit is not announced when comes to mobile devices, computers and tablets or TV.

It will be beneficial to compare the findings from non-profit and for-profit and find out if there are possible policies and prevention for users similar to current health and safety warnings while using digital technologies as VR.

As well it will be good to share the outcomes about the feelings about Virtual Reality headsets and Augemenative Reality glasses which are quite low in terms of willingness to try or have an attitude towards them. Would this change the production planning and investors' funding or change the direction of the products by directing less to the public domain and more to specific industry fields? Of course, 163 participants in the survey is still a fraction to change the direction of production and advertisement. The number of participants would have to be much bigger to potentially reevaluate the business models. It is a good starting point.

Interviews could be part of potential PhD or individual design further research conduction and planning. Due to constraints such as time, while taking promotor feedback into account the interviews with experts as optional were put on hold however I am looking toward to conducted them as part of further investigation into the subject of research while at the same time applying for a PhD or while applying for the new career position.

FINAL *THOUGHTS*

SELF-FEEDBACK

Beneficial studies had been conducted across the public domain in which the research shows a few interesting aspects and as well clear conclusions of behaviours and exposition on digital devices, versus eyesight awareness, personal care about health and maintaining healthy eyesight within the awareness about the assistive technologies, attitudes towards VR and AR and the acceptance of the innovative technologies versus the digital technologies and assistive technologies of eyesight.

The primary research went beyond the initial expectations because of a much larger amount of participants than initially aim what is of course a big plus for the results. None of the participants didn't drop out of the survey which is a highly positive achievement and highly appreciated. The 45 questions were asked and the survey was 7 minutes on average to complete.

The survey was open almost for 2 weeks which gave a good amount of time for reaching the participants and letting participants answer in their own time, especially in one of the busiest periods of the year, both personal and professional, the end of the year in December, before Christmas and New Year Holiday, which is for many is a period of celebration and gathering where people do travel more frequently and busy with home preparation, as well as finalising the financial year for businesses, schools, work projects etc.The survey findings show a few important aspects and could be a great opening for the dialogue between non-profit health sector government organisations, and for-profit companies producing digital devices, VR and AR as well as digital web and app products.

As per the design plan and production, the survey needed to be finalised to bring final findings and, outcomes, insights, and conclusion however definitely it will be good to continue it to receive even more public opinions and reevaluate further acceptance, attitudes and awareness, which might bring more insights..

The goal of the primary research went very well which brought a feeling of completion, delighted with the willingness to do the survey and being willing to be open to more questions and research studies in the future. The direct messages were as well received within the shared positive opinions. People found that the topic itself and the questions were interesting too which is another good plus as it looks as if it matters to the public and that's why

the contribution was so high. Channels such as LinkedIn, Slack, What App, and Email did help a lot. Answers were collected from networks known and unknown, and 90% of participants were never met in person or online which minimises any sort of direction towards one or another's opinion.

More than 110 anonymous answers versus almost 43 shared contact details which is also a great proportion truly unexpected. The survey went very well even the branching didn't cause initial challenges as questions if yes, and no couldn't be established easily with the MS Forms Student Account which can be easily done on a private MS Forms account or within Google forms or any other. However, following the requirements and restrictions IADT MS Forms was used which was consulted well with the promotor. Even if this obstacle the survey achieved great success.

Positively as well went the literature view on the final subject even when the thesis proposal during the secondary research did change the course from bionic limbs, and smart prosthesis, to posthumanism, through augmentative technologies of the future human body and mind. This was an interesting aspect of the journey and would not be changed at all even if it took a bit of extra time. Definitely, the discovery stage benefits the define stage and because of that finding the gaps in the academic peer paper reviews was clear.

The establishment from the early days of good cooperation with the truly inspiring and supportive promotor and supervisors by taking all consecutive feedback into account was truly grateful for and helped evaluate the research aims and objectives on a deeper and better level while at the same time independently conducting the research further in the right direction.

The findings of the gaps in the peer paper reviews, within the personal and project aims and objectives, finding the rationals, design planning and production overall went well within the final design product and service propositions and future next steps to take.

The primary research participants' answers and testing phase participants' feedback and usage of products do inspire me to further investigate and establish a career in design for good, for a good change that matters for all.
Whenever something is done for the first time it

is a bit challenging even if done previously in certain aspects although it is still different.

This academic journey itself is a great lesson to appreciate and learn from. The tips which came now for further research on this topic or any other for non-profits to design for change will be to have a much more clear definition of the production time and stick with it more rigid.

The amusement of finding so many interesting subjects did impact the time and this is a well good lesson to take to stay clear with one topic, one course and then be brought to many, similar but indeed different. The Christmas break for many print offices also should be taken into account and the final print could be an appointment before. But it all worked out super well in the end.

With the spirit of Christmas and good values, the missions and goals of the research studies to help support the public and potentially interesting future clients, I am highly satisfied with the project although as in every design, there is room for improvements, especially time management while combining the professional work with clients and master thesis together and own wellbeing.

Overall the final research major project is successful in both the established research questions and areas of research to narrow down the research by aiming for the best results, chosen design methodology, strategic planning and design, outcomes and design ideas within the visual communication editorial design itself and the solution products design proposal within practical and preferences testing.

Gratitude and appreciation to all who were part of this journey in 1st and 2 years of Design for Change, Master of Arts studies at IADT, including all lectures, tutors, supervisors, staff, classmate students, Charrette student participants and major research project participants with special thanks to supervisor Dr Hilary Kenna for making it happen.

Thank you.
Kind Regards,
Katarzyna Haśnik