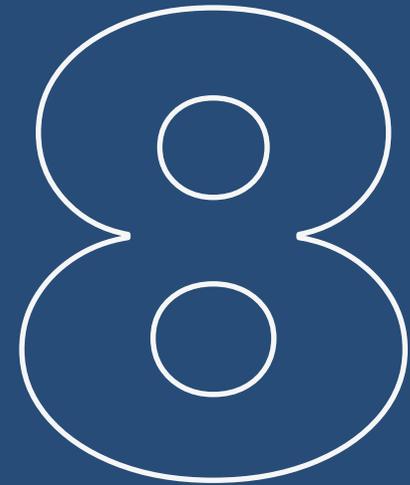


UNHEARD SIGNALS
APPENDIX



Appendix A - Interview Questions

Appendix A1 - Interview Questions (non-Phonak ActiveVent users)

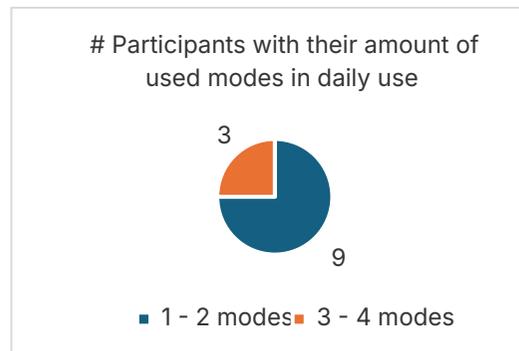
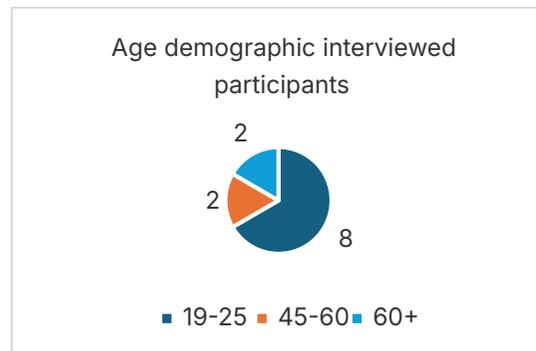
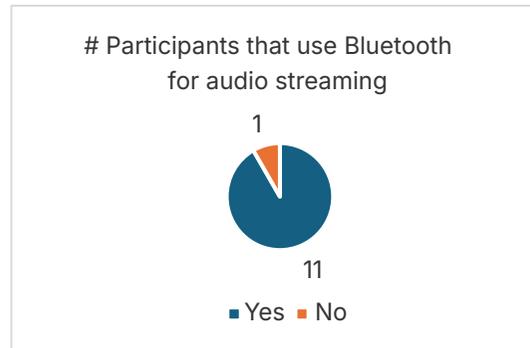
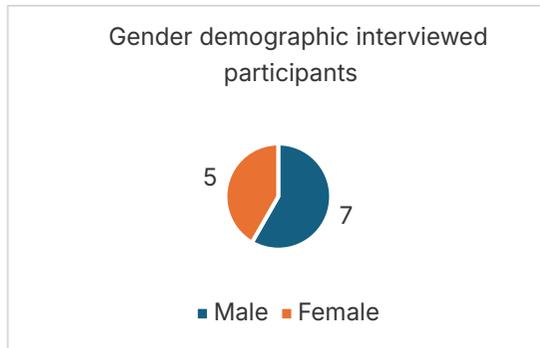
- May I record this conversation?
- What is your age?
- How long have you had hearing loss? Could you tell me how it started / what the diagnosis is?
- Which model do you use? May I take a photo of it?
- Have you used other models before this one? How long is a hearing aid typically used?
- In what respects is your current model an improvement or a deterioration?
- Do you notice a difference in personal stigma before and after owning a hearing aid?
- In which situations do you experience the greatest benefit from your hearing aid?
- In which situations do you experience the greatest disadvantages of your hearing aid? What are the main frustrations?
- How do you experience the sound quality?
- How comfortable is your hearing aid? Do you experience pressure, occlusion, or irritation?
- Do you have experience with ventilation vents in your hearing aid? How do you experience them?
- How do you experience the maintenance of your hearing aid?
- To what extent do you have control or autonomy over the product?
- What would you like to see changed or improved in your hearing aid?
- Would you be willing to use a more technical or mechanical system in your hearing aid if it improved your comfort and autonomy?
- Is there any additional information you would like to share?
- May I contact you again in the future to test and evaluate prototypes?

Appendix A2 - Interview Questions (Phonak ActiveVent users)

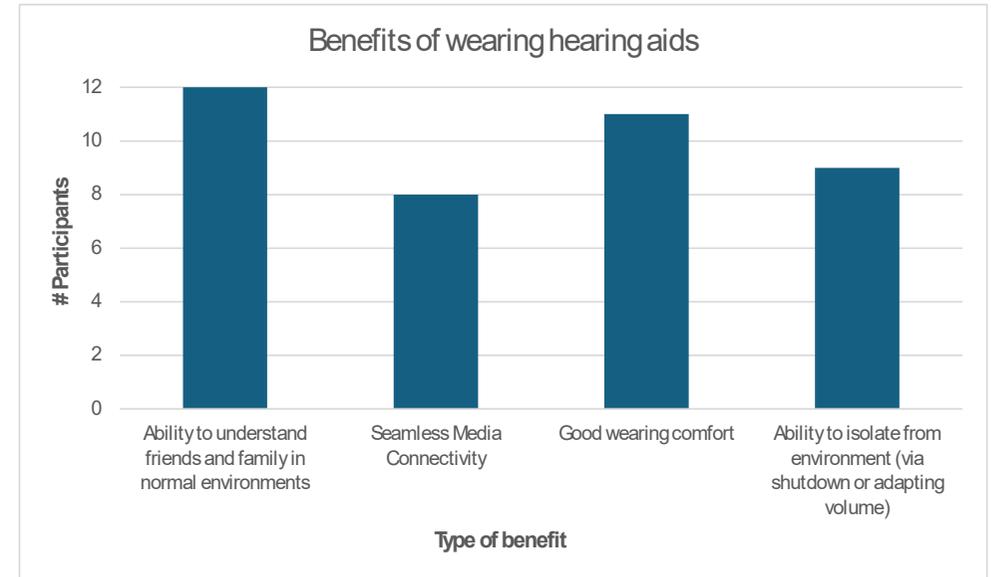
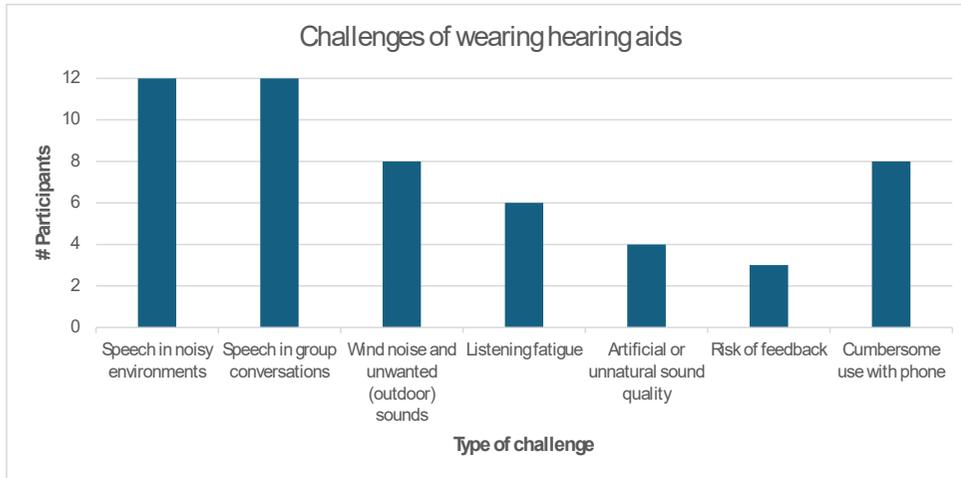
- May I record this conversation?
- What is your age?
- How long have you had hearing loss? Could you tell me how it started / what the diagnosis is?
- May I take a photo of your hearing aid?
- Have you used other models before this one? How long is a hearing aid typically used?
- In what respects is your current model an improvement or a deterioration?
- Do you notice a difference in personal stigma before and after owning a hearing aid?
- Why did you start using (or were you advised to use) the ActiveVent?
- How do you use the ActiveVent in daily life? In which situations would you switch from an open to a closed system?
- How do you experience the switching?
- In which situations or moments do you experience the greatest benefits of your hearing aid?
- In which situations or moments do you experience the greatest disadvantages of your hearing aid? What are the main frustrations?
- How do you experience the sound quality (compared to your previous model)?
- How do you experience the wearing comfort of the ActiveVent (pressure, occlusion, irritation)?
- How do you experience the maintenance of your hearing aid?
- To what extent do you feel you have personal control over the use of the ActiveVent?
- What would you like to see changed or improved in your hearing aid?
- Would you be willing to use a more technical or mechanical system in your hearing aid if it improved your comfort and autonomy?
- Is there any additional information you would like to share?
- May I contact you again in the future to test and evaluate prototypes?

Appendix B - Gathered insights from user interviews

Appendix B1 - Pie charts showing demographic information



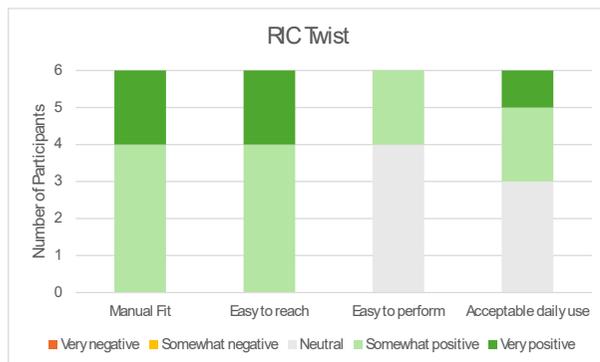
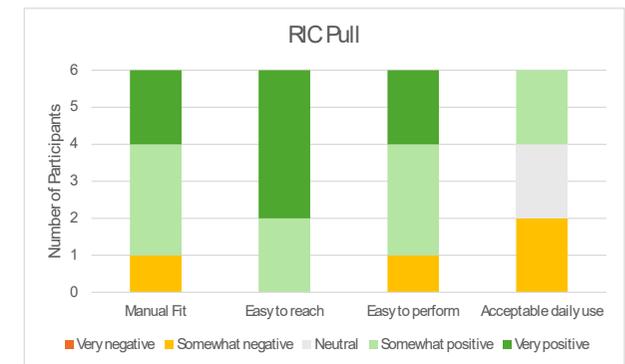
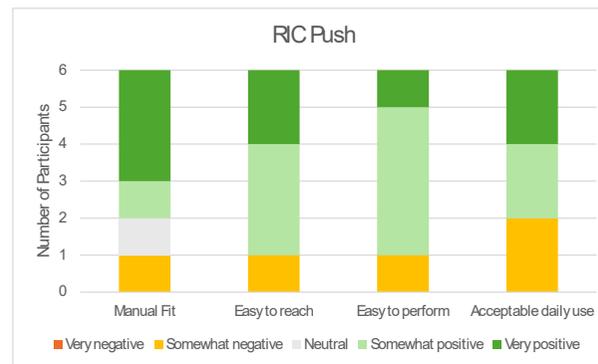
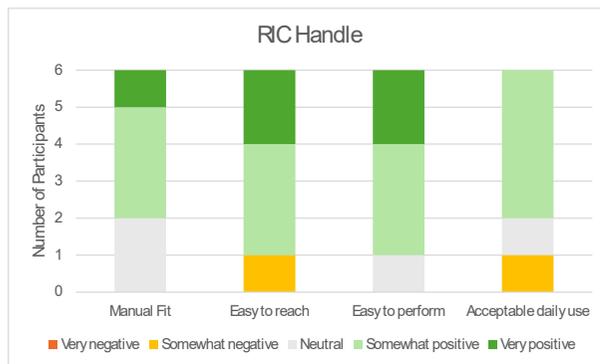
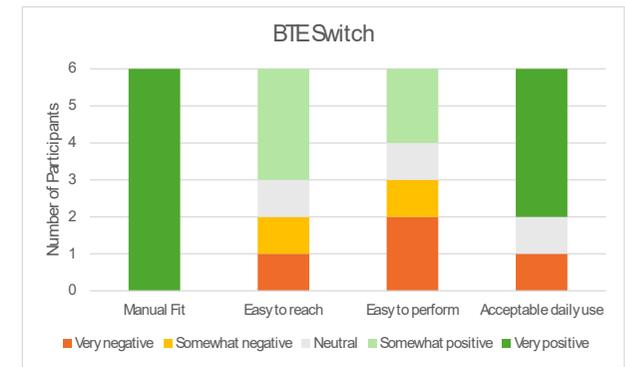
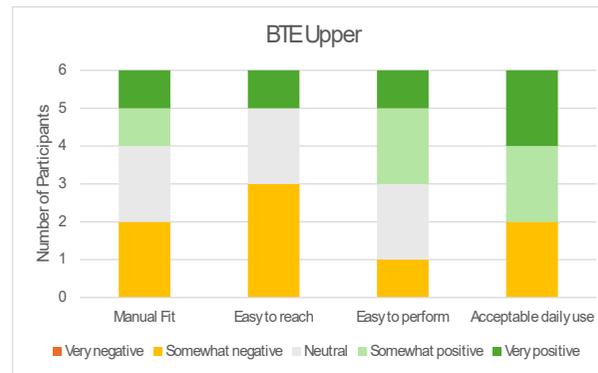
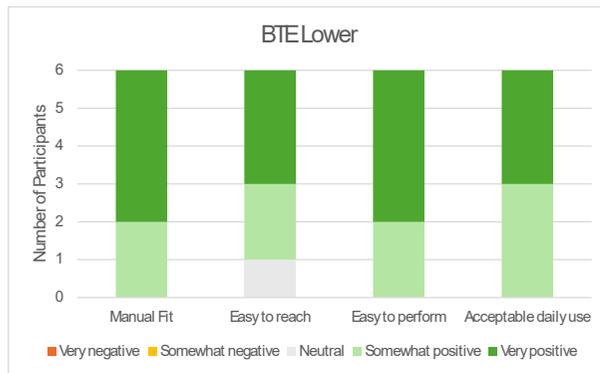
Appendix B2 - Bar charts showing challenges and benefits of wearing hearing aids



Appendix C - List of requirements

	Description	Must have (M) Should have (S) Could have (C) Will not (W)	Verification	Tracking
#	Requirement		Verification method	Source
R1	Performance (acoustic)			
R1.1	The design must contain a manual mechanism that provides an open vent and a closed vent system	M	Check	Sonion Netherlands
R1.2	Vent size diameter could be adjustable	C	Check	Ch. 2.2.1
R1.3	Vent must be placed close to the dome	M	Check	Ch. 2.2.1
R1.4	Mechanism must provide open vent (3-4 mm) and closed vent (0 mm)	M	Measure	Sonion Netherlands
R1.5	Sound outlet must be positioned after the vent holes	M	Check	Ch. 2.2.4
R1.6	The design must preserve the current tube's cross section	M	Check	Ch. 2.2.4
R1.7	The product should not create hearing discomfort to users	S	Check	Sonion Netherlands & Author
R2	User comfort and Ergonomics			
R2.1	The user has manual control over the product	M	Check	Sonion Netherlands
R2.2	The design must offer the ability to the user to adjust their perceived sound	M	Check	Ch. 2.3.2 & Ch. 2.5.2
R2.3	Mechanism should have an instant switch	S	Check	Ch. 2.5.2
R2.4	The mechanism should be intuitive to use	S	Check	Ch. 2.5.2
R2.5	The product should not create wearing discomfort to users	S	Check	Sonion Netherlands & Author
R2.6	The product mechanism should be operable using only one finger or fingernail	S	Check	Ch. 4.5.3
R2.7	The product should contain clear tactile or mechanical feedback	S	Check	Ch. 4.5.3
R3	Design constraints			
R3.1	The design must ensure reliable vent locking	M	Check	Ch. 2.2.3
R3.2	The design must be <= to the dimensions of the ActiveVent	M	Check	Ch. 4.3
R3.3	The mechanism must be compatible with an internal architecture in which all components are permanently glued together	M	Check	Ch. 4.3
R3.4	The design must be compatible with a soft dome	M	Check	Ch. 4.4
R4	Durability and Reliability			
R4.1	The mechanism must be robust to insertion and removal forces	M	Measure	Sonion Netherlands
R4.2	The product should be moisture and earwax resistant	S	Measure	Sonion Netherlands
R5	Manufacturability			
R5.1	The product must be produceable with existing manufacturing methods	M	Check	Sonion Netherlands
R5.2	The product must be manufacturable within the current RIC manufacturing tolerances	M	Check	Sonion Netherlands
R5.3	The mechanism should be produced automatically	S	Check	Sonion Netherlands
R6	Aesthetics			
R6.1	The product should not contribute to stigmatisation	S	Measure	Ch. 2.1.2
R7	Sustainability			
R7.1	Assembly allows for modular repairability	C	Check	Author
R8	Storage and transport			
R8.1	Product components should be packed in existing packaging	S	Check	Author

Appendix D - Results Intuitive Interaction Test



Appendix E - Project Brief



Personal Project Brief – IDE Master Graduation Project

Name student _____ Student number _____

PROJECT TITLE, INTRODUCTION, PROBLEM DEFINITION and ASSIGNMENT

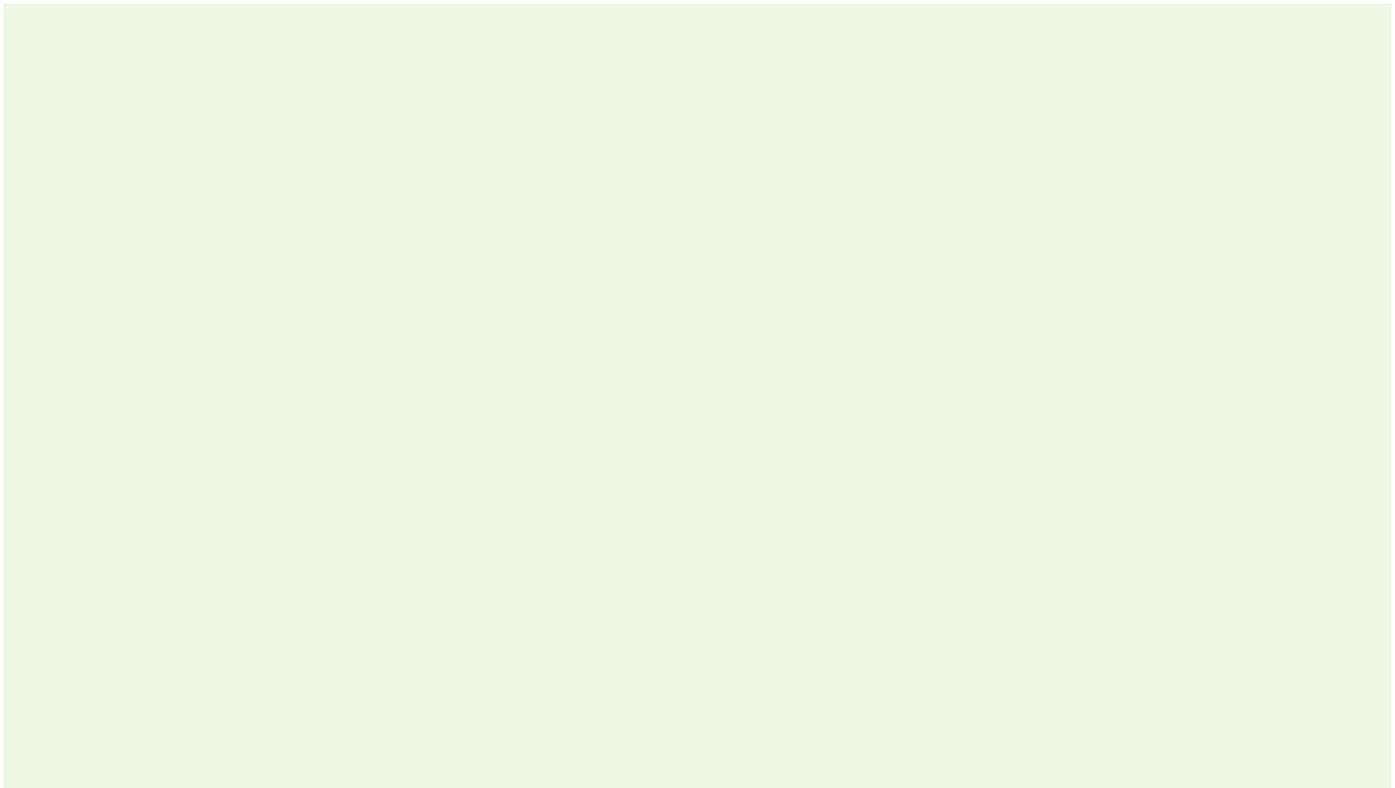
Complete all fields, keep information clear, specific and concise

Project title _____

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

Introduction

Describe the context of your project here; What is the domain in which your project takes place? Who are the main stakeholders and what interests are at stake? Describe the opportunities (and limitations) in this domain to better serve the stakeholder interests. (max 250 words)



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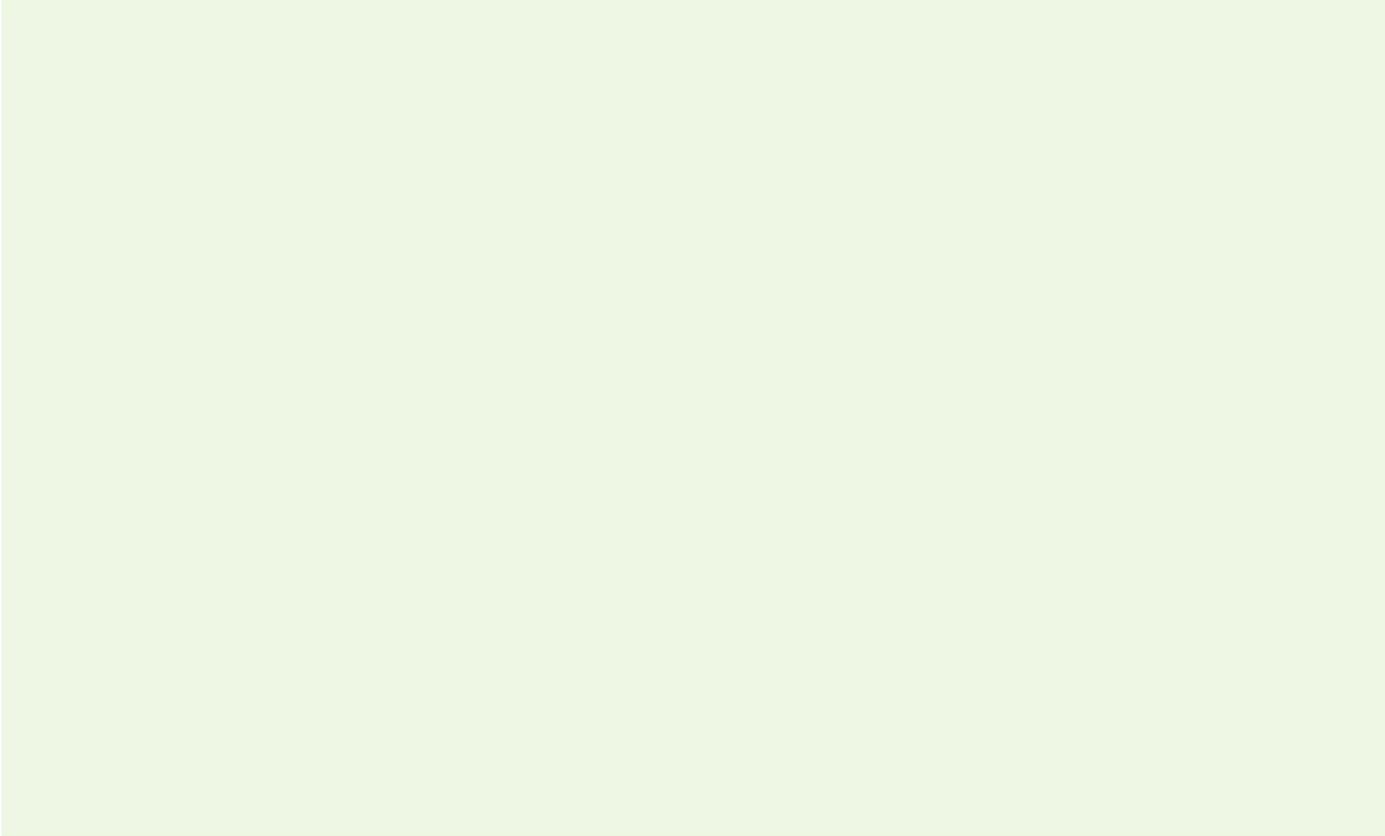


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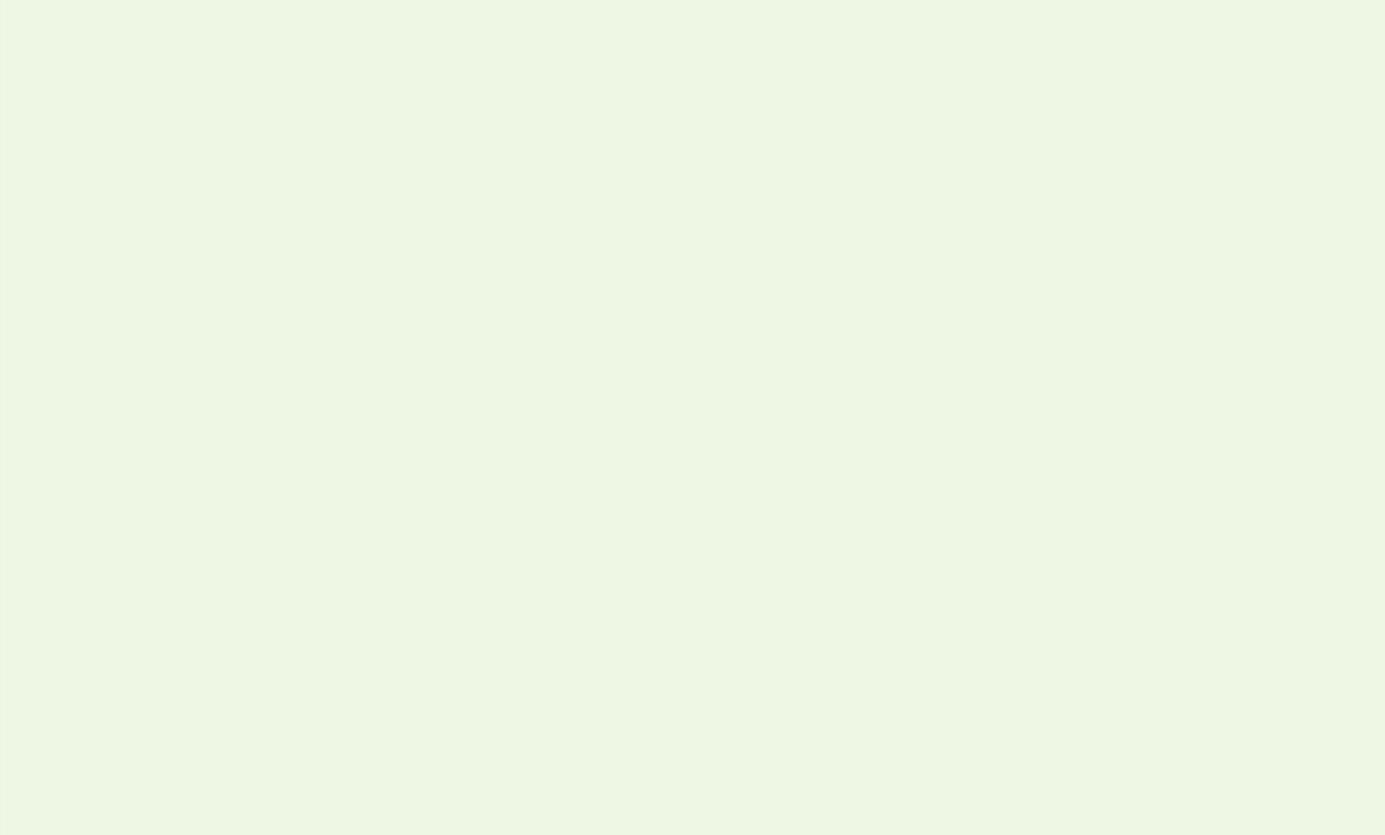


image / figure 2

Personal Project Brief – IDE Master Graduation Project

Problem Definition

*What problem do you want to solve in the context described in the introduction, and within the available time frame of 100 working days? (= Master Graduation Project of 30 EC). What opportunities do you see to create added value for the described stakeholders? Substantiate your choice.
(max 200 words)*

Assignment

This is the most important part of the project brief because it will give a clear direction of what you are heading for. Formulate an assignment to yourself regarding what you expect to deliver as result at the end of your project. (1 sentence) As you graduate as an industrial design engineer, your assignment will start with a verb (Design/Investigate/Validate/Create), and you may use the green text format:

Then explain your project approach to carrying out your graduation project and what research and design methods you plan to use to generate your design solution (max 150 words)

Project planning and key moments

To make visible how you plan to spend your time, you must make a planning for the full project. You are advised to use a Gantt chart format to show the different phases of your project, deliverables you have in mind, meetings and in-between deadlines. Keep in mind that all activities should fit within the given run time of 100 working days. Your planning should include a **kick-off meeting, mid-term evaluation meeting, green light meeting and graduation ceremony**. Please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any (for instance because of holidays or parallel course activities).

Make sure to attach the full plan to this project brief.
The four key moment dates must be filled in below

Kick off meeting _____
Mid-term evaluation _____
Green light meeting _____
Graduation ceremony _____

In exceptional cases (part of) the Graduation Project may need to be scheduled part-time. Indicate here if such applies to your project

Part of project scheduled part-time	
For how many project weeks	
Number of project days per week	

Comments:

Motivation and personal ambitions

Explain why you wish to start this project, what competencies you want to prove or develop (e.g. competencies acquired in your MSc programme, electives, extra-curricular activities or other).

Optionally, describe whether you have some personal learning ambitions which you explicitly want to address in this project, on top of the learning objectives of the Graduation Project itself. You might think of e.g. acquiring in depth knowledge on a specific subject, broadening your competencies or experimenting with a specific tool or methodology. Personal learning ambitions are limited to a maximum number of five.

(200 words max)

