# IDE Master Graduation Project

## Project team, procedural checks and Personal Project Brief

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

- Student defines the team, what the student is going to do/deliver and how that will come about
- Chair of the supervisory team signs, to formally approve the project's setup / Project brief
- SSC E&SA (Shared Service Centre, Education & Student Affairs) report on the student's registration and study progress
- IDE's Board of Examiners confirms the proposed supervisory team on their eligibility, and whether the student is allowed to start the Graduation Project

### STUDENT DATA & MASTER PROGRAMME

Complete all fields and indicate which master(s) you are in

| | |
|---|---|
| Family name | Che |
| Initials | X.Che |
| Given name | Xiaoyu |
| Student number | 5707188 |

| | |
|---|---|
| IDE master(s) | IPD ☐ Dfl ☐ SPD ✔ |
| 2nd non-IDE master | |
| Individual programme *(date of approval)* | |
| Medisign | ✔ |
| HPM | ☐ |

### SUPERVISORY TEAM

Fill in he required information of supervisory team members. If applicable, company mentor is added as 2nd mentor

| | | | |
|---|---|---|---|
| Chair | Jiwon Jung | dept./section | DOS |
| mentor | Maaike Kleinsmann | dept./section | DOS |
| 2nd mentor | Yvonne Gillis | | |
| client: | Syntilio | | |
| city: | Amsterdam | country: | the Netherlands |
| optional comments | As a Medisign project, I need guidance from professionals in the medical design field. In the comp any, I can collaborate closely with colleagues from backgrounds in interaction design(2nd mentor Yvonne), technology, and management, thus receiving guidance from multiple perspectives. | | |

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

! Chair should request the IDE Board of Examiners for approval when a non-IDE mentor is proposed. Include CV and motivation letter.

! 2nd mentor only applies when a client is involved.

### APPROVAL OF CHAIR on PROJECT PROPOSAL / PROJECT BRIEF -> to be filled in **by the Chair** of the supervisory team

Sign for approval (Chair)

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Name Jiwon Jung Date 13 May 2024 Signature

## CHECK ON STUDY PROGRESS

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

Master electives no. of EC accumulated in total _____ EC

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

| | | |
|---|---|---|
| | **YES** | all 1st year master courses passed |
| | **NO** | missing 1st year courses |

Comments:

Sign for approval (SSC E&SA)

Name _____ Date _____ Signature _____

## APPROVAL OF BOARD OF EXAMINERS IDE on SUPERVISORY TEAM -> to be checked and filled in by IDE's Board of Examiners

Does the composition of the Supervisory Team comply with regulations?

| | | |
|---|---|---|
| **YES** | | Supervisory Team approved |
| **NO** | | Supervisory Team not approved |

Comments:

Based on study progress, students is …

| | |
|---|---|
| | **ALLOWED** to start the graduation project |
| | **NOT** allowed to start the graduation project |

Comments:

Sign for approval (BoEx)

Name _____ Date _____ Signature _____

# Personal Project Brief – IDE Master Graduation Project

**Name student** Xiaoyu Che **Student number** 5,707,188

## PROJECT TITLE, INTRODUCTION, PROBLEM DEFINITION and ASSIGNMENT

Complete all fields, keep information clear, specific and concise

**Project title** One step towards hybrid homecare service:
Enhancing the workflow of remote centralists with an integrated digital plarform

*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)*

Most elderly people in the Netherlands strive to maintain their independence for as long as possible, leading to a preference for home care ("thuiszorg" in Dutch) as their primary form of aged care. Homecare organizations offer personalized care plans tailored to individual needs, providing skilled caregivers who assist with medical tasks like injections and medication, as well as daily activities such as bathing and eating.

Medical resources for Dutch citizens receiving home care are regionally allocated. In cases of temporary needs or emergency medical conditions, elderly can contact homecare organizations. Remote centralists are responsible for quickly assessing and dispatching suitable nursing personnel, ranging from neighborhood assistance to hospital ambulances.

With an expected rise of 860 thousand people aged 65 and above in the Netherlands between 2020 and 2030, the home care industry anticipates heightened demand. However, the growth rate of professional caregivers is not expected to match this surge. Consequently, many organizations started to integrate medical devices like automatic medication dispensers and fall detection devices to supplement care services, leading to a shift towards a hybrid care model.

During this transition, the centralist's working content will undergo the greatest change.This is not only due to the divergence in communication between device-triggered events and traditional patient calls but also because of the increasing number of device-triggered events, resulting in an overall increase in the centralist's responsibility for delivering home care services. Therefore, optimizing the workflow of centralists emerges as a pivotal opportunity during this transition, where Syntilio can contribute by updating their working tools.

➔ *space available for images / figures on next page*

*introduction (continued): space for images*



image / figure 1



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)*

I want to enhance the workflow for centralists handling hybrid home care requests. Under remote-care conditions, centralists are challenged to swiftly understand event situations, access patient personal information, medical records, and care team information to make informed decisions. With the integration of medical devices, numerous communication tasks will be automated by these devices, further driving the integration of this process into digital platforms. However, the current software used in the Dutch homecare industry is generally outdated and cannot adapt to the needs of centralists' work. Additionally, as care tasks shift towards a hybrid patient care model, new values and needs may emerge.

Furthermore, optimizing workflows presents an opportunity to enhance the overall quality of nursing services and allocate remote care resources more effectively in the region. Involving more informal caregivers like family members and neighbors in handling non-urgent medical events could reduce the burden on professional nursing staff and minimize unnecessary use of emergency resources, thereby elevating the overall quality of home care services and improving the distribution of remote care resources in the area.

## 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:*

Design a working prototype for centralists from care organizations to enhance the quality of remote care and optimize their working experience in device initiated homecare cases.

*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)*

My project plan is based on the triple diamond design process proposed by Zendesk.
The project progresses through three main phases: Discovery, Define, and Development.
During the Discovery phase (estimated six weeks), the primary objective is to achieve a shared vision among key stakeholders. The planned design activities involve reviewing literature, conducting user research (interviews + observation), and a blue printing session.

Define (expected in four weeks) aims to propose the ideal workflow journey.Specifically, it includes co-creation session, market research, and ideation.
The first two diamonds are not linear but iterative processes.

The final Develop+Validate phase aims to deliver the overall solution.?Drawing on Syntilio's agile development method, I will start this phase with two rounds of agile development for key touchpoints/features and test them internally within the team and with students. Then, take the prototype to different care organizations for validation.

## 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** | 24 Apr 2024 |
| **Mid-term evaluation** | 21 Jun 2024 |
| **Green light meeting** | 16 Aug 2024 |
| **Graduation ceremony** | 13 Sep 2024 |

*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 | 20 |
| Number of project days per week | 5,0 |

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)*

The complexity of the system captivates me. In reality, various stakeholders frequently encounter value conflicts and barrier s to sharing information and resources, leading to rare instances of harmonious services. I believe this is why delving into the fuzzy front end holds significant value for services. Only by comprehending each stakeholder's pain and gains can one constr uct a comprehensive view of the system and glean valuable insights.

Moreover, besides being a service design project, this project also encompasses unique facets of medical design, which furth er piqued my interest. TU Delft possesses ample expertise and project experience in medisign, making it the most suitable pl ace for me to undertake a healthcare-related design project. Compared to other fields, engaging in a medical project instills a deeper sense of responsibility in me, propelling me to fully immerse myself in the project.

As this my first time independently completing a large-scale design project, I aspire to acquire project management expertise through this experience. Additionally, I aim to use this project as an opportunity to revisit the knowledge and tools I've learn ed over the past year and a half, while also embracing the opportunity to acquire new service design experience along the w ay.

**Delft University of Technology**
**INFORMED CONSENT**

You are being invited to participate in an interview study regarding the emotional need of Centralists in dutch remote Homecare Centers. This study is being conducted by Xiaoyu Che from the TU Delft in collaboration with Syntilio.

**Purpose of the Study**
The purpose of this interview is twofold: first, to validate some of the assumptions we made about the emotional challenges and needs of Centralists based on previous research findings; second, to brainstorm promising design directions together and gather deeper insights into related work scenarios. The interview will be conducted in person and is expected to take approximately 60 minutes.

**Research Procedure**

As a participant, you will be asked to provide feedback and generate creative ideas related to the design topic. This will include:
• Sharing you current and previous work experience in related domains(e.g hospitals or other call centers)
• review and give feedback upon 4 existing design directions
• Ideate design concepts aimed at improving homecare Centralists' affective wellbeing in the previous four design directions: control&autonomy, empathy vs. urgency, meaningful conversation, reward&appreciation.

During the session, audio recordings and photos will be made to capture the discussions and interactions. These materials will be used for further analysis and to inform the next steps in the design process.

**Data Handling and Privacy**
The interview and usability test will involve audio recording and written notes, with transcriptions converting recordings to text. Only the research team will have access to the raw data, and the original recordings will be destroyed after transcription. Your anonymous data will be securely stored in Project Storage at Delft University of Technology for analysis, research presentations, publications, and the thesis.

As with any online activity the risk of a breach is always possible. To the best of our ability your answers in this study will remain confidential. We will minimize any risks by making the the interview completely anonymous, any of your personal information (name, gender, address, company name, etc.) wouldn't be used in thesis or further publications.

Your participation in this study is entirely voluntary and you can withdraw at any time without giving any reasons. You are free to omit any questions.

**Contact Information**
If you have any questions or need further information, please contact:

- Xiaoyu Che
- Responsible Researcher: Jiwon Jung

Thank you for considering participating in this study. Your input is valuable and will contribute significantly to the advancement of knowledge in this field.

**TEMPLATE 2: Explicit Consent points**

*Please make sure that you select (and amend as necessary) any Explicit Consent points which are relevant to your study and exclude those which do not apply. You should also add further points and necessary to address your specific research situation.*

| PLEASE TICK THE APPROPRIATE BOXES | Yes | No |
|---|---|---|
| **A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICPANT TASKS AND VOLUNTARY PARTICIPATION** | | |
| 1. I have read and understood the study information dated [ / / ], or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction. | ☐ | ☐ |
| 2. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason. | ☐ | ☐ |
| 3. I understand that taking part in the study involves: Data will be collected during the video-recorded co-creation session, such as *written notes, photos and audio recordings*. I give permission for collecting this data and for making photos and video recordings during the research. Data will be processed and analysed anonymously (without my name or other identifiable information). The data will only be accessible to the research team. The video recording will be destroyed after transcribed as text, and the photos will be not recognisable in publications and reports about the project. | ☐ | ☐ |
| **B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)** | | |
| 4. I understand that the following steps will be taken to minimise the threat of a data breach, and protect my identity in the event of such a breach:<br>*Anonymous data collection, transcription, blurring image, audio modification.* | ☐ | ☐ |
| 5. I understand that personal information collected about me that can identify me, such as *my name and my workplace*, will not be shared beyond the study team. | ☐ | ☐ |
| 6. I understand that the (identifiable) personal data I provide will be destroyed after 6 months. | ☐ | ☐ |
| **C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION** | | |
| 7. I understand that after the research study the de-identified information I provide will be used for master graduation thesis, reports, and publications. | ☐ | ☐ |
| 8. *If you want to use quotes in research outputs then add extra question:* I agree that my responses, views or other input can be quoted anonymously in research outputs | ☐ | ☐ |

**Signatures**

| _____ | _____ | _____ |
|---|---|---|
| Name of participant [printed] | Signature | Date |

*[Add legal representative, and/or amend text for assent where participants cannot give consent as applicable]*

I, as legal representative, have witnessed the accurate reading of the consent form with the potential participant and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

| _____ | _____ | _____ |
|---|---|---|
| Name of witness [printed] | Signature | Date |

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

| _____ | _____ | _____ |
|---|---|---|
| Researcher name [printed] | Signature | Date |

Study contact details for further information: [*Name, phone number, email address*]

**Back to text**

**Delft University of Technology**
**INFORMED CONSENT**

You are being invited to participate in a co-creation workshop for a digital work platform of homecare industry. This study is being conducted by Xiaoyu Che from the TU Delft in collaboration with Syntilio.

**Purpose of the Study**
The purpose of this co-creation session is to share the findings from the research and engage participants in discussions to explore potential design directions. The session will involve active participation from all attendees in the form of discussions and collaborative activities.

**Research Procedure**

As a participant, you will be asked to provide feedback and generate creative ideas related to the design topic. This will include:
• Co-creating design concepts aimed at improving homecare Centralists' sense of control and autonomy in their work.• Identification of the triggers that influenced your mood.
• Clustering, rating, and prioritizing both your own and others' design ideas.

During the session, audio and video recordings will be made to capture the discussions and interactions. These materials will be used for further analysis and to inform the next steps in the design process.

**Data Handling and Privacy**
Only the research team will have access to the raw data.The original video recordings will be destroyed after analysis.
Your anonymous data will be securely stored in Project Storage at Delft University of Technology for analysis, research presentations, publications, and the thesis.

As with any online activity the risk of a breach is always possible. We will minimize this risk by ensuring the confidentiality of your responses. All data will be anonymized, and personal information (name, gender, address, company name, etc.) will not be used in the thesis or further publications.

Your participation in this study is entirely voluntary and you can withdraw at any time without giving any reasons. You are free to omit any questions.

**Contact Information**
If you have any questions or need further information, please contact:

- Xiaoyu Che
- Responsible Researcher: Jiwon Jung

Thank you for considering participating in this study. Your input is valuable and will contribute significantly to the advancement of knowledge in this field.

**TEMPLATE 2: Explicit Consent points**

*Please make sure that you select (and amend as necessary) any Explicit Consent points which are relevant to your study and exclude those which do not apply. You should also add further points and necessary to address your specific research situation.*

| PLEASE TICK THE APPROPRIATE BOXES | Yes | No |
|---|---|---|
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| 1. I have read and understood the study information dated [ / / ], or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction. | ☐ | ☐ |
| 2. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason. | ☐ | ☐ |
| 3. I understand that taking part in the study involves: Data will be collected during the video-recorded co-creation session, such as *written notes, screenshots video recordings*. I give permission for collecting this data and for making photos and video recordings during the research. Data will be processed and analysed anonymously (without my name or other identifiable information). The data will only be accessible to the research team. The video recording will be destroyed after transcribed as text, and the photos will be not recognisable in publications and reports about the project. | ☐ | ☐ |
| **B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)** | | |
| 4. I understand that the following steps will be taken to minimise the threat of a data breach, and protect my identity in the event of such a breach:<br>*Anonymous data collection, transcription, blurring image, voice modification.* | ☐ | ☐ |
| 5. I understand that personal information collected about me that can identify me, such as *my name and my workplace*, will not be shared beyond the study team. | ☐ | ☐ |
| 6. I understand that the (identifiable) personal data I provide will be destroyed after 6 months. | ☐ | ☐ |
| **C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION** | | |
| 7. I understand that after the research study the de-identified information I provide will be used for master graduation thesis, reports, and publications. | ☐ | ☐ |
| 8. *If you want to use quotes in research outputs then add extra question:* I agree that my responses, views or other input can be quoted anonymously in research outputs | ☐ | ☐ |

**Signatures**

| _____ | _____ | _____ |
|---|---|---|
| Name of participant [printed] | Signature | Date |

*[Add legal representative, and/or amend text for assent where participants cannot give consent as applicable]*

I, as legal representative, have witnessed the accurate reading of the consent form with the potential participant and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

| _____ | _____ | _____ |
|---|---|---|
| Name of witness [printed] | Signature | Date |

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

| _____ | _____ | _____ |
|---|---|---|
| Researcher name [printed] | Signature | Date |

Study contact details for further information: [*Name, phone number, email address*]

**Back to text**

**Delft University of Technology**
**INFORMED CONSENT**

You are being invited to participate in a diary research study titled Moody Journal. This study is being conducted by Xiaoyu Che from the TU Delft in collaboration with Syntilio.

**Purpose of the Study**
The purpose of this research study is to capture the emotional events of participants (homecare centralists) while working in a care centre and collect the triggers that cause these emotions. The study will take approximately one workday to complete.

**Research Procedure**
As a participant, you will be asked to fill in mood cards throughout your workday. These cards will include:

- A rating of your emotional state at various times.
- Identification of the triggers that influenced your mood.
- Completion of a mood statement describing your feelings.

**Data Handling and Privacy**
Only the research team will have access to the raw data. The original mood cards will be destroyed after analysis. Your anonymous data will be securely stored in Project Storage at Delft University of Technology for analysis, research presentations, publications, and the thesis.

As with any online activity the risk of a breach is always possible. We will minimize this risk by ensuring the confidentiality of your responses. All data will be anonymized, and personal information (name, gender, address, company name, etc.) will not be used in the thesis or further publications.

Your participation in this study is entirely voluntary and you can withdraw at any time without giving any reasons. You are free to omit any questions.

**Contact Information**
If you have any questions or need further information, please contact:

- Xiaoyu Che
- Responsible Researcher: Jiwon Jung

Thank you for considering participating in this study. Your input is valuable and will contribute significantly to the advancement of knowledge in this field.

| PLEASE TICK THE APPROPRIATE BOXES | Yes | No |
|---|---|---|
| **A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICPANT TASKS AND VOLUNTARY PARTICIPATION** | | |
| 1. I have read and understood the study information dated [ / / ], or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction. | ☐ | ☐ |
| 2. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason. | ☐ | ☐ |
| 3. I understand that taking part in the study involves: data will be collected during the research, such as *notes on mood cards*. I give permission for collecting this data. Data will be processed and analysed anonymously (without my name or other identifiable information). The data will only be accessible to the research team. | ☐ | ☐ |

| PLEASE TICK THE APPROPRIATE BOXES | Yes | No |
|---|---|---|
| **B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)** | | |
| 4. I understand that the following steps will be taken to minimise the threat of a data breach, and protect my identity in the event of such a breach:<br>*Anonymous data collection, handwriting digitalization.* | ☐ | ☐ |
| 5. I understand that personal information collected about me that can identify me, such as *my name and my position and my workplace*, will not be shared beyond the study team. | ☐ | ☐ |
| 6. I understand that the (identifiable) personal data I provide will be destroyed after 6 months. | ☐ | ☐ |
| **C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION** | | |
| 7. I understand that after the research study the de-identified information I provide will be used for master graduation thesis, reports, and publications. | ☐ | ☐ |
| 8. I agree that my responses, views or other input can be quoted anonymously in research outputs | ☐ | ☐ |

**Signatures**

_____ _____ _____

Name of participant [printed] Signature Date

*[Add legal representative, and/or amend text for assent where participants cannot give consent as applicable]*

I, as legal representative, have witnessed the accurate reading of the consent form with the potential participant and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

_____ _____ _____

Name of witness [printed] Signature Date

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

_____ _____ _____

Researcher name [printed] Signature Date

Study contact details for further information: [*Name, phone number, email address*]

Appendix B1

# Interview Guide at Care Center B.

## Part One _Getting to know

Could you tell me a bit about yourself as a centralist?
-What is your current position, and what types of cases do you manage?
-How many years of experience do you have as a centralist?
-What is your educational background?
-What is your future plan for career? What will be your next move after this job?

Could you tell me how is the set up/structure of Care Center B?
-What types of cases will be handeled in Care Center?
-Are there different types of Centralists in care center here? What is their responsibilities?

Energy taker vs Engergy giver
In academic theory, the concept of employees' affective well-being suggests that various factors in the work environment—such as physical, psychological, and environmental elements—can influence their mental energy. If we use the analogy of an energy battery, supportive factors in the work environment can be seen as "energy givers," while work demands and negative factors are "energy takers." This continuous charging and draining process leads to two possible outcomes: a positive result, which is high employee engagement, or a negative result, which is burnout.

-From your own perspective, what aspects of your work as a Centralist role provide you with the most emotional support or replenishment? Are there specific factors or elements that come to mind that contribute to this?
-On the contrary, what aspects of your work or specific situations are particularly draining on your emotional energy, or are things you prefer to avoid?

## Part Two _ Design Themes Ideation

-From your experience at Centeralists, do you think these four topics I've found make sense to you?
Do they seem like real needs or problems that actually exist? Why?
-Out of these four topics, which one do you think is the most important or urgent, or should have the highest priority? And which one feels less important to you, and why?

## Reward and Appreciation

-The first theme I'm interested in is reward and appreciation. It refers to the positive feedback you can get at work. When we talk about these terms, what comes to mind for you?

-Under this topic, we've found that clients and other caregivers (like colleagues) are the two main groups that provide positive feedback and recognition. Do you agree with this? Is that how you see it?

-If we want to improve in this area, what design direction or focus would you recommend? For example, should we emphasize getting more encouragement from clients or from other caregivers?

## Control and Autonomy

-From your experience in your current role at Centralist, how much control or autonomy do you feel you have?
-In what areas do you feel you have a lot of control, and in which areas do you think you need more autonomy or control?

-In my preliminary research, I found three promising and interesting design directions.
The first is related to Data Management. We noticed that managing user data is still quite conventional, and there's potential for improvement here.

The second is about balancing work time and managing control during busy periods or when handling a lot of cases.

The third direction is about increasing flexibility and autonomy in the case handling process. Out of these three directions, which do you think is the most important? What are your thoughts on these directions?

## Empathy and Urgency

The next topic is about empathy and urgency, or rationality.
-When I mention this topic, what comes to mind for you?
Our main finding about this topic is that it mostly relates to the process of making triage decisions.
We found that centralists often get caught between trying to provide the best service to clients and dealing with practical realities.
-Do you think these findings are the most relevant to this topic?
-And do you think this applies to the situation at Envida as well?

## Meaningful Communication

The final topic is meaningful communication or meaningful bonding.
-What does this keyword can make you think of?

Regarding the topic of meaningful communication or bonding, our previous findings focus on meaningful conversations between centralists and clients, as well as between centralists and colleagues, including building special connections.
-How do these two directions—building closer connections with clients versus with colleagues—differ in significance for you? And which one do you prioritize higher?

## Part Three _ Future Discussion

I understand that at Care Center B, you use specialized softwares and workflows to handle cases triggered by digital devices, such as Medido and alarm buttons. Now, we categorize all device-triggered cases as one type, while all other cases—whether administrative or medical—are considered another type.
Our research shows that the trend in the Dutch homecare industry is to continue promoting and encouraging the use of digital devices.
Therefore, in the future, we can anticipate that the proportion of device-triggered cases will steadily increase.

-From your perspective as a Centralist, do you view this trend or shift as positive? Why or why not?
-How do you think this will challenge your current way of working?Or what do you think is an urgent need of change in your current way of working considering this trend?

Appendix B2

# Detailed Evidence for Interviews at Care Center B.

## Integrated Information as a fundamental and primary need

While “Integrated Information” was not identified as an emotional dilemma in the same way as the other themes, its impact was evident throughout the interviews. When asked about factors that exert the greatest emotional influence, interviewees highlighted aspects such as “support from colleagues and protocols (energy givers), and frustrated clients (energy takers)” (as noted by Interviewee 1) and “leisure time with coworkers, warm conversations with clients (energy givers),” alongside “limited breaks during peak periods and cross-departmental call transfers (energy takers)” (as noted by Interviewee 2). “Integrated Information” was not explicitly mentioned as a direct emotional influence in these responses.

However, its importance emerged repeatedly when discussing the four other themes. Information fragmentation often surfaced as a root cause of frustration or a focal point for improvement suggestions. For instance, Interviewee 2 proposed enhancing their sense of control by introducing a feature on the client page that allows direct contact with the caregiver responsible for this specific client. Similarly, during discussions on “Meaningful Communication,” challenges in accessing critical patient information—such as local care plans—were highlighted as factors contributing to communication breakdowns.

## 11 specific care scenarios related to Control and Autonomy

### ①Limited Access to Cross-Departmental Information

In situations requiring collaboration with other departments. Centralists’ ability to maintain a sense of control is significantly hindered by the fact that the amount of information they have access to is often no greater than what is available to the patients themselves. Even when Centralists recognize that obtaining follow-up feedback on cases from other departments would be beneficial, there is no established channel for making such requests or receiving this critical information.

### ②Barriers to Accessing Key Client Alerts

Interviewee 1 highlighted another scenario that can lead to errors in their work. A small subset of clients (fewer than 1%) have specific alerts or precautions, such as patients with dementia who are ineligible to modify their care plans or clients who explicitly refuse male caregivers. This critical information, however, is not prominently displayed on the client page and requires manual verification. Given the efficiency pressures inherent in their work, Centralists are often unable to perform thorough checks for every case, which can lead to errors in decision-making. The lack of easily accessible, relevant information thus directly undermines their ability to exercise informed control over their work and maintain a high standard of care.

## ③Care Centers used for Cross-Department Coordination

Participant 2 outlined an example of inefficient care requests within their daily work. When two internal care departments need to communicate, they often rely on the care center's line to facilitate internal transfers due to the lack of direct contact information for other departments. This often results in clients being "pushed back," creating delays and an overall suboptimal experience for them.

## ④Shift Handover Challenges

During shift handovers, particularly around 10:00 p.m., a high volume of staff changes across multiple teams and external personnel often leads to issues such as unanswered calls and missing or incomplete handover information. While night shifts officially commence at 9:45 p.m., staff members scheduled to remain on duty until 10:00 or 10:10 p.m. may occasionally leave early, resulting in a gap in phone coverage during this crucial time frame.

This situation is further exacerbated by the absence of a dedicated manager to oversee and coordinate the handover process, as Centralists often hold similar ranks without any designated authority figure to ensure a smooth transition.

## ⑤Medication Management During Shift Changes

A significant challenge faced by Centralists is the rigid scheduling of medication times, with many patients' medications set to be administered at a fixed time, such as 9:00 p.m. This arrangement often leads to a surge in missed medication events just before shift changes (e.g., around 9:45 p.m.). The resulting peak period creates unnecessary coordination burdens, as off-duty staff may need to be recalled to address missed doses, potentially extending their work hours and disrupting shift transitions. Participant 1 emphasized that concentrating all patients' medication times at the same point is inherently inefficient, as it fails to distribute tasks evenly, thereby creating unnecessary workload peaks and complicating workflow management for Centralists.

## ⑥Inflexible Protocols

When dealing with special cases, such as clients with alcohol addiction or frequent callers seeking attention, care staff expressed a desire for more direct communication to address inappropriate behaviors. However, existing protocols mandate maintaining a consistently friendly and impartial demeanor, limiting their ability to respond candidly. This rigidity increases emotional strain on staff, who must continuously manage challenging interactions within narrow boundaries.

## ⑦Manual Clients' Logbooks

Care teams have developed a manual system using individual client logbooks to track and share relevant information about clients requiring special attention. Centralists can document patterns, such as frequent calls for attention, allowing the entire team to adopt a more proactive and coordinated approach, such as involving a client's family. This illustrates the creative strategies care staff use to navigate institutional constraints.

## ⑧Shared Weekly Word Document for Collective Information Management

One notable example of proactive information management within the care center is the use of a shared Word document, which serves as a collective record for team members. This document logs daily updates, tracks special arrangements, and records critical needs or conditions of individual clients.

Information such as required follow-up calls or specific handling instructions for certain clients is manually entered, ensuring it is accessible to all team members.
While this manual documentation process aims to facilitate real-time information sharing and coordination, it also symbolizes the care center's proactive attempt to integrate critical patient information. This effort arises from the challenge that important updates about clients may be scattered across multiple sources, such as client files, daily emails, and individual logbooks.Navigating these disparate data streams before gaining a comprehensive understanding of a situation or determining the best course of action can be cumbersome, highlighting the need for more streamlined solutions.

## ⑨Managing Multiple Calls from the Same Client

An opportunity arises from the need to manage cases that inherently require multiple interactions to resolve. Interviewees noted that certain situations cannot be addressed through a single call and necessitate ongoing communication. Centralists often anticipate these cases and understand the likely progression of interactions. However, when calls are randomly routed to coworkers unfamiliar with the client's history, it can lead to inconsistent care and frustration for both clients and staff. Centralists expressed a desire for a system that would allow such cases to be directed to the same person, ensuring continuity and personalized care delivery.

## ⑩Varied Authority Levels of Data Management

The interviews revealed notable disparities in data management authority among remote caregivers. For instance, when the acute care team reports new observations from a client's home visit—such as the presence of a large dog—Centralists can document this information in a temporary client-specific logbook. However, only senior nurses have the authority to make formal updates to the client's internal record. This hierarchical structure can lead to delays and requires a high degree of initiative from staff to ensure important information is properly maintained, potentially impacting the accuracy and timeliness of client records.

## ⑪Authority to Adjust Protocols

Senior Centralists possess the authority to modify protocols as needed. For example, due to limited staffing during night shifts, initial protocols required immediate dispatch in response to alarm button calls. This was later revised to first verify the urgency of the situation via a phone call, responding only if the situation was confirmed to be critical. This change, made by senior managers after numerous false alarms, aimed to prevent resource waste and ensure more efficient allocation of personnel.