

2022

**Maria Mercedes
Cartay Briceno**

**A CONTRIBUTION OF PRODUCT
DESIGN FOR PROMOTING HEALTH
AND WELL-BEING AT HOME OFFICE
WORK:**

**ADDRESSING THE ROLE OF
PSYCHOLOGICAL DETACHMENT.**

2022

**Maria Mercedes
Cartay Briceno**

**A CONTRIBUTION OF PRODUCT
DESIGN FOR PROMOTING HEALTH
AND WELL-BEING AT HOME OFFICE
WORK:**

**ADDRESSING THE ROLE OF
PSYCHOLOGICAL DETACHMENT.**

Dissertação apresentada ao IADE - Faculdade de Design, Tecnologia e Comunicação da Universidade Europeia, para cumprimento dos requisitos necessários à obtenção do grau de Mestre em Design de Produto e Espaço realizado sob a orientação científica da Doutora Maria Emília Capucho Duarte, Professora Associada da Universidade Europeia.

Acknowledgments

I would like to thank my advisor Emilia Duarte, who has been an enormous source of knowledge and has guided me in the process of completing this dissertation.

Special mention to my family; my husband Pedro, my mother Maria Eugenia and brother Juan, who constantly give me all their support and love. Motivating me every day to continue growing and learning.

Keywords

Product design, Well-being, work-life balance, work from home, switch off from work, psychological detachment.

Abstract

Esta dissertação do Mestrado em Design de Produto e do Espaço, procura responder a uma problemática atual, que tem que ver com o impacto do trabalho remoto, a partir de casa, na saúde mental dos "trabalhadores do conhecimento" em particular. Uma das maiores dificuldades que as pessoas relatam ter é não serem capazes de se desligar do trabalho, por forma a alcançar um estado conhecido no campo da psicologia como Desprendimento Psicológico. Neste contexto, o principal objetivo deste trabalho foi criar um produto capaz de ajudar as pessoas no processo de desconexão do trabalho em casa. Para isso, estabelecemos uma investigação interdisciplinar, onde se destacou o contributo da psicologia. Após a realização de uma revisão da literatura, que culminou na definição de um quadro teórico, realizámos pesquisas com utilizadores, começando com inquéritos para conhecer aos utilizadores que estão a ser afetados e concluímos esta etapa com um grupo de discussão/oficina, onde os utilizadores foram encorajados a conceber soluções para os ajudar a desligarem-se do trabalho. Deste processo colaborativo e iterativo resultaram várias ideias, que emergiram juntamente com o quadro teórico, e que culminaram com a proposta de três conceitos de produto especificamente destinados a ajudar as pessoas a desligarem-se. Estes foram subsequentemente avaliados pelos utilizadores e, de acordo com as suas percepções, um dos conceitos foi escolhido para refinamento. Devido a constrangimentos impostos pela pandemia de COVID-19 não foi possível produzir um protótipo deste conceito para avaliação com utilizadores, o que limita este estudo.

Table of contents

Introduction	19
1.1. Problem Statement	21
1.2. Research aim and objectives	22
1.3. Research questions	23
1.4. Motivation	23
1.5. Relevance / Impact	24
1.6. Design of the study/research	25
1.7. Thesis structure	25
State of the Art	28
2.1. Context: Historical moment	28
2.2. Literature review	34
2.2.1. Psychological Detachment	39
2.2.2. Boundaries and Micro role transitions	43
2.2.3. Managing physical artifacts	45
2.2.4. Product and space design	47
2.2.5. Vision in Product Design approach	48
2.2.6. Design with intent and metaphors	51
Theoretical framework and hypothesis	58
3.1. Theoretical Framework	58
3.2. Summary of strategies	66
3.3. Hypothesis	67
Design Research	69
4.1. Sense Intent	69
4.2. Research	70
4.2.1. Know the context	70
4.2.2. Know people	74
4.2.2.1. Questionnaire	74
4.2.2.2. Focus-group/workshops	80
4.3. Analysis	85
4.3.1. Frame insights	85
4.3.2. Personas and User Journey	86
4.4. Synthesis	90
4.4.1. Explore concepts	90

4.4.2. Ideation	96
Concept 1 - Desk Scale	96
Concept 2 - Bird factor	97
Concept 3 - Time Reels	98
4.4.3. Evaluation with potential users	99
4.4.4. Frame solutions	107
4.5. Realization	109
4.5.1. Realize offerings	109
Final remarks	116
5.1. Conclusions	116
5.2. Limitations and future considerations	118
References	120
Appendix	124
I: Timeline of activities	124
II: Questionnaire	126
III: Workshops ideation boards	135
IV: Evaluation with potential users (UEQ)	139

Index of Figures

Figure 1. Study diagram	7
Figure 2. A model of Work-home Boundary Work	18
Figure 3. Stages of the VIP process	22
Figure 4. Metaphors and analogies map	28
Figure 5. Summary of strategies.	38
Figure 6. Pomodoro technique	42
Figure 7. Time Timer	43
Figure 8. Categories of strategies indicated by questionnaire participants	49
Figure 9. Beginning of the work routine	51
Figure 10. End of the work routine	51
Figure 11. Workshops ideation boards	55
Figure 12. Psychological Detachment components	57
Figure 13. Persona 1: High level of PD	58
Figure 14. Persona 2: Medium level of PD	59
Figure 15. Persona 3: Low level of PD	60
Figure 16. A day in Ana's life.	61
Figure 17. "End of shift" proposed symbols	63
Figure 18. "Balance" proposed symbols	64
Figure 19. Game approach concept	65
Figure 20. Totem approach concept	66
Figure 21. Visual mark approach concept	67
Figure 22. Desk scale concept illustration	68

Figure 23. Bird factor concept illustration	69
Figure 24. Time Reels concept illustration	70
Figure 25. Scale structure of the The user experience questionnaire (UEQ)	72
Figure 26. Desk Scale benchmark evaluation graph	74
Figure 27. Bird factor benchmark evaluation graph	75
Figure 28. Time Reels benchmark evaluation graph	76
Figure 29. Mean results of the User Experience Questionnaire (UEQ)	77
Figure 30. Reminders database	81
Figure 31. Bird appearance	82
Figure 32. Bird appearance deteriorated state	83
Figure 33. Bird appearance END reminder	83
Figure 34. Bird positions	84
Figure 35. Bird mechanism	85

Index of Tables

Table 1. Search record	8
Table 2. Key findings	10
Table 3. Participants' demographic characteristics	53

Glossary of terms and acronyms

WFH: Working from home

UCD: User-centered design

PD: Psychological Detachment

Knowledge workers: A person employed to produce or analyse ideas and information. (WordReference.com. September 2021)

Remote work: The practice of an employee working at their home, or in some other place that is not an organization's usual place of business. (Cambridge Business English Dictionary. September 2021)

1. Introduction

This dissertation addresses one of the main struggles that knowledge workers are having nowadays, while working remotely from their homes, according to the latest surveys on the experience of working from home such as the report of the State of Remote Work 2021 (Buffer, 2021), that is “Not being able to unplug”, which is related to the process of “switching off”.

This subject is related to the term, known in the field of psychology as Psychologically Detachment from work, and refers to the inability to stop thinking about work. According to the reviewed literature this issue can be related to the lack or blur boundaries that people are experiencing due to the poor physical differentiations between the two domains. Previous studies have determined that psychological detachment from work during off-hours is beneficial for well-being (Sonnentag & Fritz 2014). “Well-being is a broad concept that comprises both favorable short-term affective states (e.g., enthusiasm, relaxation) and more long-term aspects of psychological health (e.g., life satisfaction, absence of burnout).” (Sonnentag, 2012, p. 115)

Home seems to be the preferred workplace spot for those working in remote mode, followed by coworking spaces and cafes (Buffer, 2021). However, due to the current context of COVID-19 homes became almost the obligatory place of work. Moreover, many companies are considering remote work permanently, or at least, to adopt a hybrid way of working, referring to the mixed approach of offering employees the possibility to continue working remotely for a few days a week. This situation raises some concerns about how people are going to adapt their living spaces for working from home in a long-term situation and how they are going to manage their physical and mental well-being.

In a situation where the workplace no longer necessarily has a space (Physical) distinct from home, understanding the complex relation of work-home interactions is critical. The research on this topic has mainly focused on defining how this “Spillover” of work into people’s lives or the inability to “psychological detach” from work has a direct negative impact on health and well-being. Failure to successfully achieve psychological detachment from work has been associated with several health-related problems, such as sleep disturbance, dysphoria and cardiovascular disease (Cropley & Millward 2009). Switching-off from work is therefore an important means to prevent work-related long-term health problems.

Despite the relevance of this topic, there is less research focused on proposing actionable strategies to help people manage the role transitions that happen when the boundaries between work and leisure activities are crossed is scarce, especially in the design area. Thus, the aim of this study was to design a product that could help to embody this role transition that happens at home when people finish working and have the need to psychologically detach from work and, ultimately, contribute to people’s work-life balance and, ultimately, promote their wellbeing.

To achieve this goal, we started by reviewing the literature, mostly from the psychology field, looking for strategies and theories related to psychological detachment from work that could feed the design process. User studies were carried out next, with the objective of ideating and proposing a design solution for a physical artifact that can help cue or mark the role transitions between work life and personal life at home. The proposed solutions were then evaluated with potential users and the results were analysed and contrasted with the hypothesis.

1.1. Problem Statement

This study focused on the following problem: How can product design help achieve the process of psychological detachment from work at home.

And its specific components are:

1. User (Remote worker, WFH)
2. Behaviours (Before, during and after working hours at home)
3. Psychology Knowledge about the process of psychological detachment
4. Product design; The development of a Physical artifact.
5. Context, home.

From the latest State of Remote Work report, carried out by Buffer (2021), for the last three consecutive years of this survey the biggest struggle with working remotely has been “Not being able to unplug”. It's important to highlight that also the biggest benefits of working remotely are related to having a flexible schedule and the flexibility of working from anywhere. So, we could say the same reasons that are being stated as benefits, are becoming the reasons for struggling also.

In the first questionnaire on Teleworking and Occupational Health, of the Covid-19 Barometer of the National School of Public Health, the results show that 54% (n = 581) of the respondents are satisfied with their situation of teleworking. However, only 37% (n = 400) are satisfied with the balance between telework and personal life. These data may be related to the perception of respondents whose work requirements are higher when telecommuting (40%). In fact, 59% (n = 661) consider that “they work more hours than usual” and 42% (n = 453) considers that it is not possible to “disconnect work” to be able to rest. However, approximately 70% of respondents consider that they have full autonomy and flexibility so they can decide how and when the job is done. 41% “sometimes” establish a working

schedule. These factors can be a contribution to maintaining job satisfaction referred to previously.

From the psychology field, this issue is framed on the spatial and technological boundary arrangements between work and home, and people's ability to create and maintain boundaries between their work and non-work roles (Ashforth, 2000). Thus, we tried to understand the phenomenon and to collect actionable strategies aiming to translate them into a physical product with the intent of easing the role transitions and providing marks or signs that could help identify the need for unplugging.

1.2. Research aims and objectives

This research aims to contribute to the improvement of people's relationship of work-life balance while WFH and, ultimately, contribute to their wellbeing.

As specific objectives we have:

- > Tackling a complex problem related to home interactions, a place that is suffering changes and going through transitions, from a design perspective.
- > To understand the problem of Psychological Detachment from work from the psychology point of view and feed the design process with strategies that could be transferable into a physical object capable of having a positive impact on changing behaviours.
- > To learn about users' experience of working from home, their routines, habits, and their strategies for managing boundaries and switching off at the end of the day.

1.3. Research questions

Every stage of the development of this research has been carried out in order to answer the following questions:

- To frame the problem and define the scope:

RQ1: What are the fundamental struggles or difficulties that people working from home are having?

- To navigate the literature and find key references and build the framework:

RQ2: What are the most common strategies implemented by users for achieving psychological detachment, and maintaining the work-home boundaries?

- Our main concern while conducting user research:

RQ3: What patterns, in daily routines of remote workers working from home, can be seen as an opportunity for implementing a design solution that could help to disconnect from work?

- And as the main question, guiding throughout this entire process:

RQ4: How can product design help achieve psychological detachment from work?

1.4. Motivation

The proliferation of home-based work, increased slowly in the 10 years before the Covid-19 outbreak, according to EU-LFS data retrieved from Eurostat “just above 11% in 2019, and in 2020 close to 40% of those currently working in the EU began to telework fulltime as a result of the pandemic”.

It can also be seen as an opportunity for raising awareness and encouraging the development of healthier work practices, as the overwork has been a reality

affecting many people. The current pandemic context made the unsustainability of this situation more evident than never and showed how severe the effects can be in the long term. You hear it in the stories of family and friends, when they express the urgent need to improve working conditions and, especially at home, to create a healthier environment. Thus, we saw this as a good opportunity to do design research with high impact for people.

1.5. Relevance / Impact

The technological developments in the last decades have made it possible to accomplish new work practices, where more dynamic, accessible, and flexible ways of working have been installed, benefiting companies and employees. Nonetheless, it has also raised new challenges on mental health, where the so-called “always on” culture can have a detrimental effect on employee wellbeing (Deloitte, 2020).

There’s an evident increased interest on the subject of employees’ mental health, in all scale companies, mostly because it is directly impacting productivity and worker relationships, compromising companies interests. As referred in Deloitte’s Mental health and employers report (2020), this can be grasped from the use of terms such as *presenteeism*, “where people work when they are not at their most productive”, and the newer trend of *leaveism* “where employees feel they must work outside of their normal working hours”. This challenges the preconceptions and cultural forms that “overworking” is acceptable and is related to success.

The relevance of this study thus lies on the one hand in the intention to promote the individual capacity of each of us to make better decisions regarding our health and well-being and, on the other hand, to assume the mediating role of artefacts, as agents capable of mediating human behaviour and, thus, transforming society.

1.6. Design of the study/research

The following diagram (see Figure 1) visually illustrates how this study was organised, its main stages and the interconnections between moments.

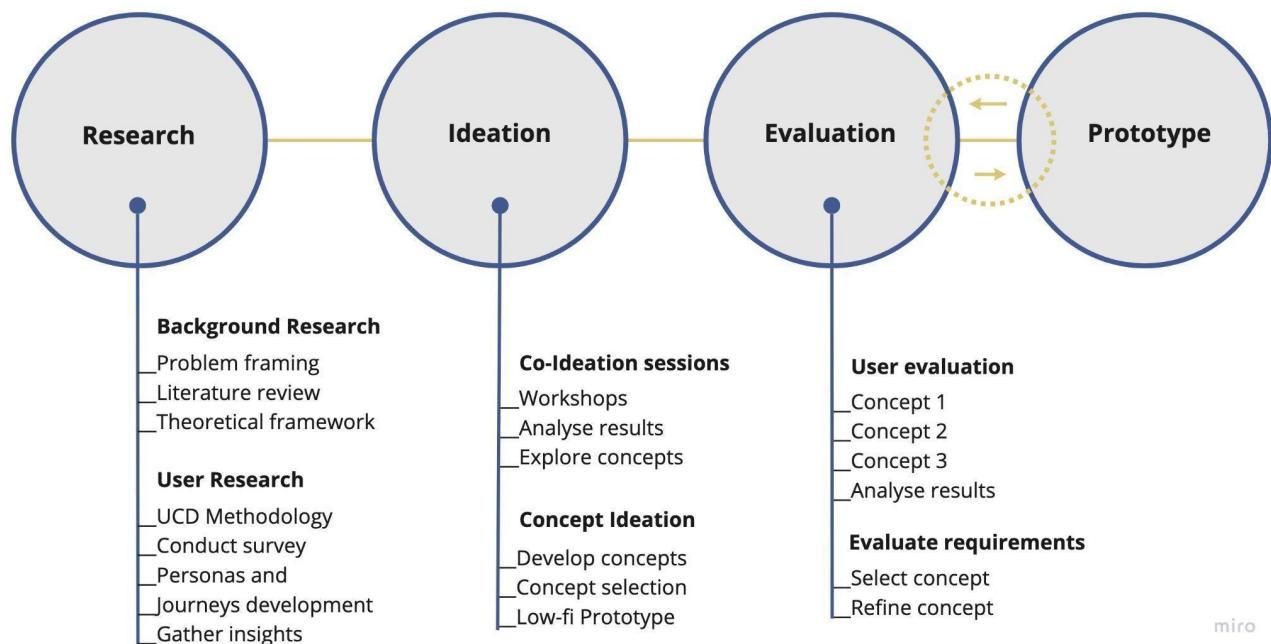


Figure 1. Study diagram

1.7. Thesis structure

This document is structured as follows: Chapter 1 presents the introduction to the study and the scope in which it is inserted, the problem, aim and objectives of the study, as well as the motivation and impact. In Chapter 2, the context of the research is evidenced, and all the key references are shown, dividing the literature review into two parts, reference material from the Psychology field and the Design field. Subsequently, in Chapter 3, the hypothesis and fundamental theories that

shaped the framework are presented. Chapter 4 consists of the development of the study, from the initial phases of user research, through the stages of ideation, evaluation, to the phases of design and implementation of a prototype. Finally, in Chapter 5 the conclusions are presented, as well as the limitations of the study and future developments.

2. State of the Art

2.1. Context: Historical moment

On March 11, 2020 — WHO (World Health Organization) Declares COVID-19 a Pandemic, Tedros Adhanom Ghebreyesus, director general of WHO, said at a briefing in Geneva the agency is “deeply concerned by the alarming levels of spread and severity” of the outbreak and by April 2020, 2.6 billion people had gone into lockdown (Weforum.org retrieved 09 Apr 2020). Ever since we have been living in this Pandemic context that is still in development, going back and forth in its stages, with restrictive measures and for periods, mandatory confinements at home in most countries. It has profoundly changed every aspect of people's lives around the world.

For the workforce “A total of 81% of the global workforce of 3.3 billion people have had their workplace fully or partly closed” (BBC News retrieved 7 April 2020), it has meant drastic changes and great challenges for companies and employees, to adapt to changing and unprecedented situations, especially for companies that did not have incorporated remote work modality and had to quickly adapt in order to overcome the moment of crisis; In terms of infrastructure, work dynamics, technology, communication tools and above all, cope with the complexity on a human level of dealing with difficult times.

Regarding the present state and future of work, there is still no consensus what the future holds, many have the opinion that this situation will lead to the end of the office spaces, such as Barclays Bank's chief executive Jes Staley has said in an interview in BBC news; “having thousands of workers in big expensive city offices

may be a thing of the past as the home-working lockdown era proves many can do their jobs perfectly well at home". Many Big tech companies, such as Twitter, state that remote work will be permanent, as its co-founder Jack Dorsey announced, "Twitter employees can now work from home forever" (The Washington Post, retrieved 1 October 2020) and Microsoft also reportedly allow its 150,000 employees to work from home permanently (Forbes, retrieved 9 October 2020). As well as other companies are planning to adopt a hybrid model with more people returning to the office but still working from home for a few days a week, for example IBM announced its proposed system of remote working, with 80% of the workforce working at least three days a week in the office. Like American Real Estate Developer Mr. Van Oostrom said from now on it will be necessary "to seduce people to come into the office, making offices fun places will be more important than ever".

We will certainly see how workspaces go through transformations, especially to accommodate sanitary requirements such as, to name a few: ventilation and regular disinfection of spaces, circulation, capacity, distribution, and social distancing of workers in office spaces. New challenges will have to be addressed in the design of these spaces, as mentioned in the Issue 05 of Vitra's e-paper, "Since not all workers can be physically present or seen by managers in hybrid organisations, it's best to identify and address potential sources of difficulty in advance. These issues will shape the design of workspaces in a distributed setup"

Remote work and home office

Also referred to as WFH or telecommuting, "is a type of flexible working arrangement that allows an employee to work from a remote location outside of corporate offices." (Gartner, retrieved 6 february 2022). These remote work

arrangements can be temporary or permanent, part-time or full-time, occasional or frequent and the difference with the term 'home office' or 'working from home', is that in this case the designated place for remote working is at home.

As a trend, accelerated by this crisis, many companies have taken the path of remote work, offering this modality as a strategy for attracting and retaining talent, reducing costs and facilitating collaborative work in different parts of the world. As for the individuals, benefits are many, such as the possibility to work from anywhere particularly millennials interest in becoming "Digital nomads" and having the opportunity to travel while working, or just reduced costs living by choosing freely the place according to the budget and not according to the office locating, eliminating commuting and having more personal time for personal activities and sharing with family and friends. According to surveys on Remote work, such as Buffer (2021), the main chosen place to work from tends to be people's home, followed by coworking spaces and cafes.

Vitra's CEO, Nora Fehlbauer, in Home Dynamics issue 06 (Released April 2021) says - "A crisis as severe as the one we are currently living through has an impact on people and on the environments that surround us. The Spanish flu and tuberculosis gave way to modern architecture – with its wide-open spaces, daylight, linear forms, and clean materials. Many homes and lives will remain uprooted and transformed, even after things eventually return to more normal conditions." Living spaces are undergoing a transformation, the dynamics have changed, and large and small spaces must adapt to accommodate all the activities that are taking place at home, that is not just a home anymore. As Poldma (2010) states in her comparison of the old and new paradigms of living/working: People worked in the office, lived at home, and enjoyed leisure time in the movie theatre. In the new paradigms of living and working, both experiences and tasks overlap one another constantly, lived experiences overlap and intersect the boundaries of

space and place/time. “Realities are defined in practice and practice is defined in space, one that can be local or global, imagined or actual, and which often cuts across boundaries physical/virtual.” (Poldma, 2010).

“In the last two decades, we have observed how offices became more home-like. Sofas entered the workspace, and soft materials and textiles created a more casual, relaxed environment. Now we are seeing signs of work and productivity entering the home with height-adjustable tables and task chairs. Still, there appears to be potential for improving high cognitive performance at home” (Vitra Issue 6, 2021). In a study called The home report (2021), the author and trend expert Oona Horx-Strathern takes a look at these critical changes: “Hoffice” space is facing a seminal moment, of active change where the open spaces of the 20th century are reshaping, in many ways; The “transversality” of furniture that accommodate the different activities, warmer materials as opposition to the technological presence, the differentiation between spaces according to functions and layouts adapting to home/work balance.

As for the challenges of working from home, they are firstly related to physical and ergonomics conditions, meaning having an adequate space for working that has acceptable acoustics and lighting for allowing work. Secondly, they are related to the aspects of the psychological state, interpersonal relationships, loneliness, stress, and time management. Having healthy routines and managing boundaries when all roles collapse into one place: Home.

Mental health

Mental health problems have serious effects not only for the people that suffer, but also for business and companies because it affects employee performance and

productivity. A Deloitte report (2020) addressing Employees Mental health affirms that “A sixth of workers are experiencing a mental health problem; stress, anxiety and depression are thought to be responsible for almost half of working days lost in Britain due to health issues. The relationship between mental health and the workplace is a complex one.” (Deloitte, 2020).

Rates of Leaveism are rising. Leaveism “is a term that describes the growing tendency of individuals to be unable to ‘switch off’ from work. It is becoming increasingly common as working remotely and flexible working have become easier thanks to technology, and can lead to overworking, a reduction in workforce morale, and burnout.” (Deloitte, 2020). Described as one of the consequences of a technology-enabled, this is the ‘always-on’ workplace culture.

On 21 January 2021, the European Parliament asked the EU Commission to present a law to allow workers to digitally disconnect from work during non-working hours without any consequences and to establish minimum standards for remote work. The “right to disconnect” is a fundamental right, which allows workers to refrain from performing work-related tasks such as phone calls, email messages and other digital communications outside of their working hours, including holidays and other types of license. Member States are encouraged to take all necessary measures to enable workers to exercise this right, through collective agreements between social partners. Member States must ensure that workers are not subjected to discrimination, criticism of or other acts of retaliation by employers.
(<https://www.europarl.europa.eu>)

Studies carried out by Eurofound (2021) show that people who work regularly at home are more than twice as likely to exceed the maximum limit of 48 hours a week, compared to those who work in office buildings. Almost 30% of people who work

from home say they work during their free time every day or several times a week, compared to less than 5% of those who work in an office environment.

Mental health problems can affect work performance in terms of increase in error rates, poor decision-making, loss of motivation and commitment, tension, and conflicts between colleagues (Harnois & Gabriel, 2000). Burnout and depression, as well as stress related physical conditions such as high blood pressure, sleeping disorders and low resistance to infections can result in an increase in overall sickness absence. Work-related stress and poor mental health are major reasons not only for absenteeism but also for occupational disability and for workers seeking early retirement (e.g., Baumann, A., Muijen, M., Gaebel, W., & World Health Organization. 2010).

In 2019 the World Health Organization included burnout in its International Classification of Diseases, and is included as an occupational phenomenon, not classified as a medical condition, describing it as “a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed.” (WHO, 2019). Acknowledging that burnout is more than just an employee problem; it’s an organizational problem that requires an organizational solution.

As stated, the seriousness of the matter is forcing companies to prioritize the psychological well-being of employees during this period and in the future “We find that there is more that employers can be doing to support mental health among the workforces. More can be done to tackle the stigma associated with mental health problems, increase awareness, and provide adequate training for employees” (Deloitte, 2020). On the other hand, work increases self-esteem and the quality of life and providing a healthy and inclusive working environment can prevent mental health problems, there is more that employers can be doing to support mental health

among the workforce (Baumann, A., Muijen, M., Gaebel, W., & World Health Organization. 2010).

2.2. Literature review

Psychology

To understand the general concepts and causes related to the identified problem of study, the difficulty to unplug from work while working from home, a literature review was conducted in various stages. In this first stage, a systematic review allowed us to discover a set of important concepts from psychology, associated with the difficulty of disconnecting from work. The search criteria was determined by defining the categories of information desired as: key concepts involved in the phenomenon, measurement tools, study design, theories, methodologies, key authors, gaps/further research. Including: research papers, journals, books, scientific articles focus on the subject matter and that propose or analyses strategies to achieve detachment. Excluding: relation with work performance and lack of sleep, family conflicts or other's consequences of not achieving detachment from work. The search record can be seen in Table 1.

After having the notion about the various terms used in the area, we moved into a second stage and ran a wide search with different keywords to find other areas or fields where this subject was studied. The Publish or Perish platform (<http://harzing.com/resources/publish-or-perish>) was used to obtain large results in different databases. Later, the material selected was reviewed with the objective of finding actionable strategies or identifying tools to help home based workers to increase psychological detachment.

Table 1. Search record

Date Searched	Database / Search Engine	Search typed in	Filters applied	Number of Results	Notes - Quality of Results
21/08/2020	Crossref	Psychological detachment from work	Non	70	Filter by hand. - try some new
22/08/2020	Crossref	Role transitions	Non	X	Too wide, not specific
22/08/2020	Crossref	Role transitions from work at home	Years from 2000 X		Too wide, not specific
24/08/2020	Crossref	Role exit	Years from 2000 X		Too wide, not specific
25/08/2020	Crossref	Activities shift / Mental switch	Years from 2000 X		Too wide, not specific
26/08/2020	Crossref	work life boundaries working from home	Non	182	Large number of results with sj
26/08/2020	Crossref	Work recurrent thoughts	Non	X	Too wide, not specific
29/08/2020	Google Scholar	Switch off from work	Non	4	The majority of results on other
29/08/2020	Google Scholar	Psychological detachment from work	Non	7	All from the author Sonnentag
10/09/2020	Google Scholar	Micro role transitions	Non	65	Stands out the work of BE Ash
12/10/2020	Google Scholar	Physical artifacts to negotiate the work-home b	Non	49	Large number of results with sj
15/10/2020	Google Scholar	Boundary management tactics	Non	41	Large number of results with N
15/10/2020	Google Scholar	Managing Work-Nonwork Boundaries	Non	330	Large number of results, speci
16/10/2020	Google Scholar	boundary work tactics	Non	29	small amount of content relate
16/10/2020	Google Scholar	work-to-home boundary crossing	Non	110	Large number of results, speci

After the wide findings in the search, the papers related to the subject, according to the title and abstract, were filtered and selected to find and review in detail, from the ones reviewed in detail the main objective was to find actionable strategies, and specific research in the subject.

After consecutively reviewing in detail the selected relevant papers, the most important findings were collected, some of them shown in Table 2. The selection intended to narrow the search and increase focus. Psychological detachment was found to be one of the most relevant concepts and Sabine Sonnentag as one the main references in the subject.

Table 2. Key findings

Search	Authors	Reference	Work area/ Field	Key concepts	Main work contribution	Methodology
Switch off from work	Mark Cropley and Lynne J. Millward	Mark Cropley & Lynne J. Millward (2009) How do individuals 'switch-off' from work during leisure? A qualitative description of the unwinding process in high and low ruminator. Leisure Studies, 28(3), 333-347. DOI: 10.1080/02643750802283444	Psychology	Switch off from work during leisure. High ruminator. Low Unwinding.	Three master themes were identified that were pertinent in differentiating the unwinding process between high and low ruminators: (1) work philosophy, (2) coping strategies and (3) coping outcomes.	This paper aims to address this gap by exploring how workers 'switch-off' and unwind from work during their leisure time. Adopted a process-oriented qualitative approach and conducted interviews to examine the unwinding process from the perspective of the individual.
	Sonnentag and Bayer	Sonnentag, S., Bayer, U. (2005). Switching off mentally: Predictors and consequences of psychological detachment from work during off-job time. Journal of Occupational Health Psychology, 10(4), 393-414. doi:10.1037/1076-898X.10.4.393	Psychology	Job stress, overload, psychological detachment, recovery, well-being	Short-term psychological detachment from work occurring during the evenings of normal work weeks. Two specific goals: First, the relationship between work-situation variables, particularly quantitative workload and psychological detachment. Second, examined whether psychological detachment from work during evening hours helps in improving well-being after work.	Data collection procedure was based on questionnaire and daily survey measures. Participants had to complete the questionnaire before they started to fill in the daily survey. We used the questionnaire to assess chronic workload and control variables at the person level.
Psychological detachment	Sonnentag and Hahn	Hahn, V., Binnewies, C., Sonnentag, S., & Mojza, E. (2011). Learning how to recover from job stress: Effects of a recovery training program on recovery, recovery-related self-efficacy, and well-being. Journal Of Occupational Health Psychology, 16(2), 202-216. doi: 10.1037/a0022888	Psychology	Recovery from job stress Recovery experience Psychological detachment	Their experimental study is the first to examine whether recovery experiences are malleable and can be deliberately promoted. And by using a waitlist control group design, we test if such a training program has positive effects on recovery-related self-efficacy (i.e., a person's belief that he or she can successfully recuperate from job stress) and on well-being indicators (e.g., emotional exhaustion).	The quasi-experimental design of this study comprised one preintervention and two postintervention measurements comparing a recovery training group to a waitlist control group. Recovery training encompassed two training sessions at an interval of one week. The first session comprised five hours, the second four hours (including breaks).
	Sonnentag, Kuttler and Fritz	Sonnentag, S., Kuttler, I., & Fritz, C. (2010). Job stressors, emotional exhaustion, and need for recovery: A multi-source study on the benefits of psychological detachment. Journal Of Vocational Behavior, 76(3), 355-365. doi: 10.1016/j.jvb.2010.06.004	Psychology	Job stressors Psychological detachment Emotional exhaustion Need for recovery	This paper examines psychological detachment (i.e., mentally "switching off") from work during non-work time as a partial mediator between job stressors and low work-home boundaries on the one hand and strain reactions (emotional exhaustion, need for recovery) on the other hand.	Survey data were collected from a sample of Protestant pastors (N = 136) and their spouses (N = 97). Analyses showed that high workload, emotional dissonance, and low spatial work-home boundaries were related to poor psychological detachment from work during non-work time. Poor psychological detachment in turn predicted high levels of emotional exhaustion and need for recovery.
	Sonnentag, Binnewies, Mojza	Sonnentag, S., Binnewies, C. and Mojza, E. (2010). Staying well and engaged when demands are high: The role of psychological detachment. Journal of Applied Psychology, 95(5), pp.965-976.	Psychology	Job demands, emotional exhaustion, work engagement, psychological detachment, recovery, Burnout	The authors of this study examined the relation between job demands and psychological detachment from work during off-job time (i.e., mentally switching off) with psychological well-being and work engagement. They hypothesized that high job demands and low levels of psychological detachment predict poor well-being and low work engagement. They proposed that psychological detachment buffers the negative impact of high job demands on well-being and work engagement.	A longitudinal study (12-month time lag) with 309 human service employees showed that high job demands predicted emotional exhaustion, psychosomatic complaints, and low work engagement over time. Psychological detachment from work during off-job time predicted emotional exhaustion and buffered the relation between job demands and an increase in psychosomatic complaints and between job demands and a decrease in work engagement. The findings of this study suggest

Well-being is a keyword in the WHO definition of health; “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”. According to the Merriam-Webster dictionary definition is “the state of being happy, healthy, or prosperous”. Multiple studies across different disciplines have shown how work conditions directly impact individuals’ well-being. “Stressful work situations are associated with poor individual well-being and increase health risks, particularly high workload” (Sonnentag & Bayer, 2005, p.393). In the current context of extensive use of remote work practices, the term of working from home is often seen as a “double-edged sword” as this practice can increase the chances of conflicts between the domains; “exposure to stressors in a given domain (e.g., work) may lead to irritability, fatigue, or preoccupation with those problems, thereby limiting one’s ability to meet the demands of other domains of life (e.g., family), thus leading to work-family conflict.” (Clark, 2000).

Clark (2000) defines this balance as “satisfaction and good functioning at work and at home with a minimum of role conflict”. Most of the work in this area makes a simplistic distinction between home-life and work-life and does not differentiate between different classifications of responsibilities within each sphere. Williams (2000) suggests that we can map people’s work–life needs within three different but connected areas of their lives. First, there is personal time and space: what do we need for the care of self and maintenance of body, mind and soul. Second, care time and space: what do we need to care properly for others? And thirdly there is work time and space: what do we need to enable us to gain economic self- sufficiency? According to Williams (2000), a balance between work and daily life could be said to be achieved when each of these areas are balanced together.

In the search for balance, where the meaning of “home” and “work” concepts start blurring and juxtaposing, depending on the level of “integration” or “segmentation”

that each person has in their dynamics (Nippert-Eng, 1996), the fundamental difference between the space where we live and the space where we work are matters of significance and meaning. Both have potentially the possibility to foster a wide range of activities and, in relation to how they are structured, are filled with cues that leads on how to use and navigate them although most spaces are created with a primary purpose and this purpose “determines their design and sensory characteristics, the objects and facilities they require, and the kinds of individuals and related activities that will be found in them” (Proshansky, 1983). Each place gives people the structure to perform certain type of activities and to manage different types of roles. Depending on the activity that is taking place, some physical transitions can help manage the role transitions as suggested by Proshansky (1983), “Whatever the role of an individual (e.g. wife, father, son, doctor, or banker), there are appropriate physical settings that not only help to define this role but indeed determine by virtue of how well they measure up as supporting physical systems”.

The ease of transitions between these two domains, seems to be a fundamental factor for developing a balanced relationship within the daily activities and the different roles that those activities entail, “the nature of role transitions - That is, the psychological (and, where relevant, physical) movement between roles, including disengaging from one role (Role exit) and engagement in another (Role entry)” (Ashforth, Kreiner & Fugate, 2000). In the subject of transitions, two main themes arise, both within the psychology field, that not only gives us the tools for understanding the phenomenon but have extensive research and user studies to comprehend the underlying mechanism of role transitions, boundaries management and recovery process, specifically - Psychological detachment.

2.2.1. Psychological Detachment

In traditional work arrangements, strictly related to fulfillment of an 8 hours working day for example, physically leaving the workplace was, for most people, the opportunity to detach from their work. In the present, being physically away from the workspace is not enough to free their mind from work because people are more concerned with meeting the goals and work objectives. This led to the need to perform additional job-related activities at home and outside of work hours, such as reading and preparing materials for the next working day and “when not deliberately accomplishing job-related tasks, individuals may continue to think about their jobs, ruminate about job-related problems, or reflect about future opportunities. When staying psychologically attached to their jobs during evening hours, individuals may not fully benefit from their off-job time.” (Sonnentag & Bayer, 2005, p.395).

The term was introduced by Etzion, Eden, and Lapidot (1998), describing “the individual’s sense of being away from the work situation”. For example, when a person is detached from work, will not engage in work activities such as answering phone calls or responding emails, and in the psychological aspects it involves stop ruminating about work problems or opportunities. “The term psychological detachment is used to emphasize the psychological component of disengaging from work during off-job time as opposed to being simply physically absent from the workplace. Psychological detachment implies a distraction from job-related thoughts. For psychological detachment to occur, it is not sufficient for one to change location by leaving the working place; one must also take a break from thinking about work- related issues.” (Sonnentag & Bayer, 2005, p.395).

Psychological detachment plays a fundamental role in recovery processes. Recovery from work refers to the process of reducing or eliminating physical and psychological strain symptoms that have been caused by job demands and

stressful events at work (Craig & Cooper, 1992). “Studies demonstrated that recovery processes during leisure time predict employee strain reactions, well-being, and job-related behaviors. One particularly powerful recovery experience is psychological detachment from work during nonwork time.” (Sonnentag & Fritz, 2015).

Recovery process

Work, particularly under stressful conditions, leads to physical and mental strain reactions. To bring this strain process to an end, recovery is needed. Recovery refers to the process that undoes strain reactions caused by job stressors (Meijman & Mulder, 1998). An important condition for recovery to occur is that the stressors causing strain reactions are no longer present (Haun, Binnewies, Sonnentag, & Mojza, 2011). Sonnentag and Fritz (2007) proposed four distinct off-job experiences that are essential in the recovery process: psychological detachment from work, relaxation, mastery, and control. Empirical studies confirmed that these experiences are positively related to well-being indicators.

Who suffers it and what causes it?

Individuals differ in the degree to which they detach from work during off-hours. For instance, people who generally react more strongly to negative events tend to detach less from work, and those who are given more work at their jobs than they feel they can accomplish during the workday switch off less from work when they are at home. It is probable that a heavy workload and high time pressure increase people’s general level of arousal, such that people find it difficult to unwind when leaving their workplace at the end of the workday and instead stay cognitively busy with work-related matters (Sonnentag, S. 2012). In addition, the combination of a heavy workload and high time pressure implies that tasks remain unfinished when

employees leave the workplace, which might increase their tendency to continue thinking about work related issues.

Various factors have been associated with poor unwinding. For instance, studies have shown that individuals reporting high demands and low control at work, ruminate more about work issues during their leisure time and take longer to unwind during the evening, compared to workers reporting low demands and high control at work. The teaching and the medical professions have been identified as being particularly demanding environments in which to work, and accordingly, studies have shown that a high proportion of workers in these types of occupations find it difficult to 'switch-off' post work. It is also known that the environment plays an important role and home workers find it particularly difficult to switch-off from work especially if they have to work in their everyday living environment (e.g., kitchen, living room, bedroom), as they are continually reminded about their work (Cropley & Millward, 2009).

The ways and places in which people spend their off-job time is an important factor in their degree of psychological detachment from work. For instance, involvement in meaningful off-job activities (e.g., volunteer work) helps people to detach from (paid) work (Mojza, Sonnentag, & Bornemann, 2011). Research on restorative environments has suggested that specific environmental features facilitate psychological detachment and recovery from work. When describing how environments can help people recover from fatigue associated with directed attention, Kaplan (1995) argued that restorative environments enable fascination and the experiences of being away are characterized by extent (i.e., richness, coherence, and scope) and have features that are compatible with people's specific momentary interests about how to spend time in the environment. The most important component of restorative environments, fascination, is the experience of effortless attention in a setting (e.g., a natural environment) that provides "soft" stimuli, which allow for reflection, so that inhibitory mechanisms

needed for directed attention can be restored. Thus, factors that are crucial for psychological detachment include not only aspects of individuals and work situations, but also the settings in which people spend their off-job time. (Sonnentag, 2012).

2.2.2. Boundaries and Micro role transitions

The theoretical framework underlying boundary theory focuses on the process of individuals' "micro" role transitions between roles, such as the transition between work and home roles (Ashforth, 2000, p. 472). Within each domain, individuals construct boundaries around their roles, with each role boundary indicating the scope of a particular role. Any pair of roles may fall along a continuum from high segmentation to high integration. Segmentation is the act of partitioning, and integration is the act of overlapping, work and non-work time, space, artefacts, and activities. Preferences for segmenting or integrating may be influenced by job structure, individual differences (Kossek et al., 2005) and the perceived benefits and drawbacks of separating or blurring role domains. Segmenting strategies diminish the blurring between work and home roles and can facilitate coping with multiple role expectations (Hewlin, 2003), help individuals preserve their personal lives (Rothbard et al., 2005), compartmentalise role identities (Ashforth, 2000) and limit interference between work and home (Rothbard & Edwards, 2003).

The concept of boundaries has been used in numerous disciplines to refer to the physical, temporal, emotional, cognitive, and/or relational limits that define entities as separate from one another (Ashforth, Kreiner & Fugate, 2000).

"The nature of role transitions - That is, the psychological (And where relevant, physical) movement between roles, including disengagement from one role (role exit) and engagement in another (role entry). "Micro" transitions - That is frequent and

usually recurring transitions, such as the commute between work and home.”
(Ashforth, Kreiner, & Fugate, 2000).

Nippert-Eng defines boundary work as "the strategies, principles, and practices that we use to create, maintain and modify cultural categories" (Nippert-Eng,1996). Boundary work is used to foster either greater segmentation or integration, that is to construct or modify the temporal, spatial, and other boundaries that demark roles and, in so doing, to create "more or less distinct territories of the self" (Nippert-Eng,1996).

Using “boundary theory” as a framework, we describe role transitions as a boundary-crossing activity, where one exits and enters roles by surmounting boundaries. Individuals create and maintain boundaries as a means of simplifying and ordering the environment. “Mental fences” (Zerubel,1991, p.2). The process results in the creation of slices of reality -domains- that have particular meaning for the individual(s) creating and maintaining boundaries. “home”, “work”, “church” are examples of social domains created by boundaries (Ashforth, Kreiner, & Fugate, 2000).

“Because of the magnitude of the transition between segmented roles, certain rites of passage tend to facilitate such transitions (Ritcher,1990). Van Gennerp (1960) defined rites of passage as ritual or ceremonies that facilitate movement of one role to another. Rites may include the presence and involvement of others, the manipulation of emotionally charged symbols (e.g., settings, props, clothing) and more-or-less formulaic behavior. Van Gennerp (1960) rites of passage comprise three types: rites of separation, which facilitates role exit; rites of transition, which facilitates psychological (and, if appropriate, physical) movement; and rites of incorporation, which facilitates role entry (Ashforth, Kreiner, & Fugate, 2000). Micro role transitions theory, with examples from the three major domains of everyday role transitions involving work: (1) work-home transitions (i.e., commuting

and home-based work), (2) work-work or at-work transitions (e.g., between one's roles of subordinate, peer, superordinate, and organizational representative; between multiple jobs), and (3) work-"third place" transitions (i.e., between work and other social domains, such as a church, health club, and neighborhood bar).

Nippert-Eng (1996) found that individuals differ in the degree to which they segment or integrate their work and home roles. Similarly, Hartmann (1997) found that individuals vary in the degree to which they have "thick" (segmented) or "thin" (integrated) boundaries around roles and other categorizations. The primary benefit of segmentation is that it reduces the blurring between roles, thus clarifying the nature of the transition. However, the primary cost is that the high contrast between roles increases the magnitude of the transition. Thus, the transition challenge in highly segmented roles lies in crossing the role boundaries: to psychologically (and, where relevant, physically) exit one role and enter the other.

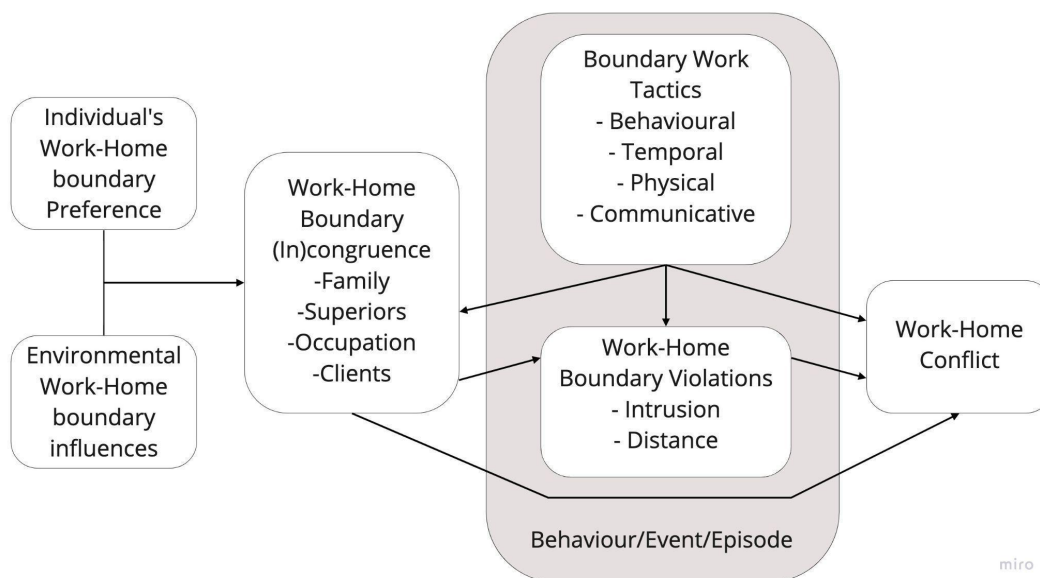


Figure 2. A model of Work-home Boundary Work (gathered from Kreiner, Hollensbe, & Sheep, 2009).

2.2.3. Managing physical artifacts

“Artifacts are visually salient, typically tangible markers that serve as cues about a culture, a domain, or an identity” (Elsbach, 2004). Some individuals use one key ring for all doors and functions; others use separate key rings for work and home as symbols to differentiate the two domains. Postal mail was also a physical artifact that some of our interviewees consciously managed, such as by (dis)allowing work-related mail to come to the home (Kreiner, Hollensbe, & Sheep, 2009). In her original study on boundary work, Nippert-Eng (1996) found that individuals use physical artifacts (often subconsciously) as ways to negotiate the work-home border. The power of the artifacts as cues or signals is shown in this example: “My children are young so I will often take off at 3:00 p.m. to go to ballet or soccer or baseball or whatever and then come back and work in the evening. Even my two-year-old knows when I put on a collar that I’m going to a meeting”. Specific examples were found, of many types of artifacts being used instrumentally, which was consistent with previous observational work on artifact use (Nippert-Eng, 1996).

As part of the boundary work tactics categories proposed by Kreiner, Hollensbe, and Sheep (2009) that are: Behavioral tactics (Including communicating expectations, confronting violators, leveraging technology, and using other people), Temporal tactics (Controlling work time and finding respite), Cognitive tactics (invoking triage and allowing differential permeability) and Physical tactics.

Physical tactics

In this study, we had a specific focus on physical tactics, because they involve space and artifacts as mediators of boundaries, and as conceptualized by Nippert-Eng (1996) one of boundary theory’s key components is the management

of the physical borders between work and home. The author notes that “work” and “home” represent two physical domains around which lie borders of various strengths. Weak physical boundaries are easily passed through, while strong physical boundaries can require significant effort to cross. Such boundaries might be a wall, a commute distance, a window, a door, or a line, although these boundaries can be manipulated (Kreiner, Hollensbe, & Sheep, 2009).

Design

To translate knowledge from the psychology field into the design process of developing an artifact, it was necessary to research what methods or models in design could be helpful for approaching this design challenge. We started by looking for materials from the references in Emotional design and behavioural science oriented design processes.

2.2.4. Product and space design

The fundamental difference between the space where we live and the space where we work are matters of significance and meaning. Both have potentially the possibility to foster a wide range of activities and in relation to how they are structured are filled with cues that lead on how to use and navigate them. Although most spaces are created with a primary purpose and this purpose “determines their design and sensory characteristics, the objects and facilities they require, and the kinds of individuals and related activities that will be found in them” (Proshansky, 1983).

The meaning of “home” is commonly related to the concept of shelter “that allows a person to live a distinctly individual life in comfort. But to see the picture more clearly, we must turn to the kinds of emotions people associate with their homes (Csikszentmihalyi, & Halton, 2012). The home is considered “to be the 'place' of

greatest personal significance in one's life, the central reference point of human existence” (Relph, 1976). Nonetheless the idea of “exclusiveness” of uses no longer has the same importance, since the way we live has suffered drastic changes in its dynamics and the relationship with spaces, people are finding themselves living and working very differently than even 5-10 years ago. In this technologically and digitally enhanced world, objects are transitory, spaces can be virtual or physical, while communication and interactions are varied and changing constantly, all affecting social and political norms. Spaces are no longer designed for one specific use, nor as the determinant of a particular set of activities (Poldma, 2010). This fluidity of spaces and activities can create some difficulties in building and maintaining these physical barriers, affecting the psychological boundaries.

2.2.5. Vision in Product Design approach

In the Delft Design Guide, where is provided an overview of the perspectives, models, approaches, and methods used in their academic projects and research on design subject we can find the context-driven and interaction centred approach called VIP - Vision in Product Design developed by Paul Hekkert and Van Dijk.

“Vision in Product Design is an approach that supports innovators of any kind to ‘design’ the vision underlying their design or intervention, for example, its reason ‘why’” (Van Boeijen, Daalhuizen, & Zijlstra, 2020). By proposing ‘the statement’ related to a future context, addressing: What do I want to offer people? What do I want them to understand, experience or do? “This statement is not directly translated into a product, products are just a means for accomplishing appropriate actions, interactions and relationships; products provide meaning for people only through interaction.” (Van Boeijen, Daalhuizen, & Zijlstra, 2020). And, by considering the desired future interaction, not knowing what to design yet, the vision of the product is conceptualized, an image of the way the product is going to be viewed, used, understood and experienced. And after envisioning the interaction between

user and product, the product character is defined, “for example the qualitative characteristics that the product has to embody. The statement, interaction and product vision together form the basis for further conceptualisation and materialisation.” (Van Boeijen, Daalhuizen, & Zijlstra, 2020)

ViP is a design approach that has three starting points:

1. Design is about looking for possibilities, and possible futures, instead of solving present-day problems.
2. Products are a means of accomplishing appropriate actions, interactions, and relationships. In interaction with people, products obtain their meaning. This is why ViP is interaction-centred.
3. The appropriateness of an interaction is determined by the context for which it is designed. This context can be the world of today, tomorrow, or may lie years ahead. Future contexts demand new and different behaviours. This makes ViP context-driven.

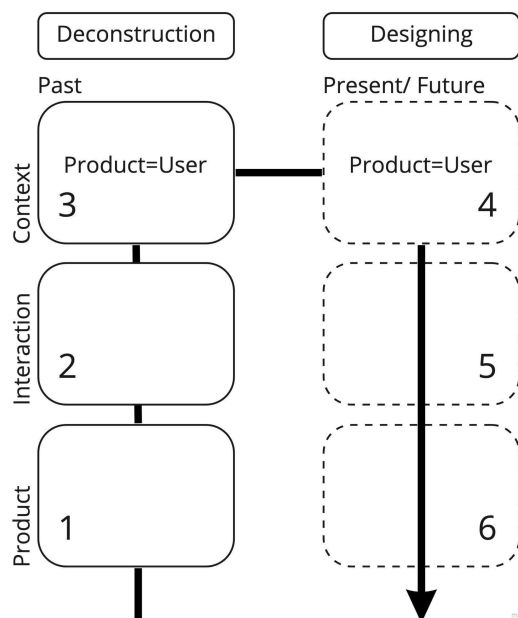


Figure 3. Stages of the ViP process (gathered from Hekkert, & Dijk, 2011).

The stages of the VIP design process are six (See Figure 4), half of them focus on Deconstructing the past, gathering information, carrying critical observation to understand the underlying factor of a product; on a product level, interaction level and context level. The other half is focused on the present/future, and the design of new interactions, starting by thinking of context factors; principles, states, developments, and trends that can be related to the domain you have chosen and will help you in formulating a statement of your design aims. From there proposing a list of interaction qualities that relate to the vision statement. Some will lead to other more refined or complex qualities. Culminating the process at the product level, and finally defining properties and qualities in detail.

Considering this method as a tool for abstraction and development of innovative ideas that could be considered as a guide for this thesis design process, in the following stages of Design research. A process that does not start by knowing what product will be designed, otherwise starts by understanding the context and the interactions that want to be created with the user, having a clear aim, and purpose embedded in the statement on what this product must fulfil. Quote from the authors (Hekkert, & Dijk, 2011), encouraging to designing based the vision of interactions, and not focusing on products or existing ideas of products;

“Your interaction vision lists the requirements that a ‘product’ must fulfil. But beware, qualities of interaction can be achieved in many ways, and not necessarily using physical form. Take care to think of different ways with which to achieve the same qualities. Try not to think of what is expected of you. Try to design an anti-product. Think low-tech, think invisible, think high-tech. Think simple, think complicated.”

2.2.6. Design with intent and metaphors

All design affects people's behaviour, across physical and digital products, services, and environments. As Herbert Simon's definition for 'designer' implies "Everyone designs who devises courses of action aimed at changing existing situations into preferred ones." Referring that all designs must embody models of human decision-making and motivations. To design aiming for behaviour change, where design is used strategically to influence particular actions, for intended commercial, social or environmental benefit, has grown significantly in the last years. Designers and researchers have to understand not only areas of social science, psychology, ethnography and other disciplines, but also the confidence to carry out research with people as part of the process (Lockton, Harrison, & Stanton, 2009).

The Design with Intent Method, suggests relevant design techniques for influencing types of behaviour, and providing examples of how similar problems have been tackled elsewhere. Defining 'Design with Intent' (Dwl) as 'design intended to influence or result in certain user behaviour', the authors have reviewed examples from a variety of disciplines, supported by a blog website and more recently an ongoing survey of designers, receiving comments, suggestions, and examples from readers around the world, and incorporated this analysis into a tool for designers (Lockton, Harrison, & Stanton, 2009). The method is structured in two 'modes', inspiration and prescription; In Inspiration mode, "the designer is inspired from a set of design patterns which are applicable to a wide range of target behaviours, grouped into six different 'lenses' representing particular disciplinary perspectives on using design to influence behaviour. The patterns, illustrated with examples from different fields, serve as a creative trigger." And In Prescription mode, "the designer formulates the brief in terms of one of a range of target behaviours, describing interactions; for each target behaviour, a subset of the most applicable design patterns from each lens is presented" (Lockton, Harrison, & Stanton, 2009).

The six 'lenses' are a way of grouping design patterns which share similar considerations, behavioural understanding or assumptions about how to influence users, the perspective according to a particular discipline might approach a brief on influencing behaviour.

All the patterns are really about interaction design in one form or another, but the Persuasive Lens "brings together some of the most common design elements of interfaces where users' interactions with the system affect how their behaviour is influenced. This lens also includes some patterns from the growing field of Persuasive Technology, where computers, mobile phones and other systems with interfaces are used to persuade users: changing attitudes and changing behaviour through contextual information, advice and guidance." (Lockton, Harrison, & Stanton, 2009).

Other relevant examples within the Persuasive lenses category (Lockton, Harrison, & Stanton, 2009):

- *Summary feedback* - "Can you give a report on what they've been doing, or its effect?" Example: GreenPrint, software that reduces wasted prints through better usability, provides users with a summary of resources saved.
- *Kairos* - "Can you give users a suggestion at exactly the right moment for them to change their behaviour?" Example: Automatic warning signs can alert drivers to upcoming dangers at the right point for them to respond and slow down accordingly.
- *Partial completion* - "Can you show that the first stage of a process has been completed already, to give users confidence to do the next?" Example: Pre-filled details such as delivery addresses can be an effective way of speeding up an order process and reducing 'shopping cart abandonment'.
- *Progress bar* - "Can you let users know their progress towards achieving a goal?" Example: As demonstrated by examples from LinkedIn and Wikipedia,

progress bars showing 'nearly complete' can make a goal seem more achievable.

- *Real-time feedback* - "Can you let users know how what they're doing is affecting the system?" Example: Energy meters can allow house- holders to see which appliances use the most electricity, and how much this is costing.

Visual lens "combines ideas from product semantics, semiotics, ecological psychology and Gestalt psychology about how users perceive patterns and meanings as they interact with the systems around them and puts them into forms which invite the designer to think about how they might influence people's behaviour. Most are predominantly visual, but they need not be: sounds, smells, textures and so on can all be used, individually or in combination."

- *Mood* - "Can you use colour, images or other sensory stimuli to set a particular mood for a user's interaction with your system?" Example: Changes in hue, saturation and brightness can set moods in rooms.
- *Perceived affordances* - Can you design the form of your system to suggest particular actions (or constraints on action) to users? Example: Reshaping the holes on bins to match the 'form' of different types of waste has been shown to increase recycling levels significantly.
- *Watermarking* - "Can you make a user feel like he or she (or someone else) 'owns' or has responsibility for something?" Example: One UK shopkeeper writes customers' names on the packaging of snacks they buy, discouraging littering through 'taking ownership'.
- *Metaphors* - Can you employ a metaphor / analogy of something familiar, so people understand or use your system the same way? Example: Tipjar.com, launched in the late 1990s, was one of the first simple micropayment systems, using the familiar metaphor of a tip jar.

The Cognitive Lens “draws on research in behavioural economics and cognitive psychology looking at how people make decisions, and how this is affected by ‘heuristics’ and ‘biases’. If designers understand how users make interaction decisions, that knowledge can be used to influence interaction behaviour. Equally, where users often make poor decisions, design can help counter this, although this may lead to a ‘we know what’s best for you’ attitude.” (Lockton, Harrison, & Stanton, 2009).

- *Emotional engagement* - “Can you design your system to engage people’s emotions, or make them emotionally connected to their behaviour?”

Example: The open beak of these ‘baby bird’ litter bins at a city farm (visited by lots of children) suggests that they are hungry and would like to be fed.

- *Habits* - Can you make it easy for a new behaviour to become habitual, by building it into an existing routine? Example: Simply choosing to take the stairs rather than the lift / elevator can quickly become part of a daily routine at home or work.

Metaphors

“The essence of a metaphor is understanding and experiencing one thing in terms of another” (Lakoff & Johnson, 1980). Metaphors are commonly used in the design process, at different stages, in early stages as a tool for understanding the problem and later on as a tool to generate solutions, largely implemented in art, architectural and design, especially product design in order to transfer the properties from one domain to another.

In the domain of product design, metaphors are used as communication channels between designers and users, through the metaphor the user can interpret the

designer's intention by incorporating cognitive or emotional messages, with particular meanings. Either by its function, aesthetics or system to relate, of the final product. Eight different types of intentions have been identified that a designer may want to communicate through a product; draw attention to the product, encourage recognition of the product type, support comprehension of a function, generate attraction or desire, foster attribution of qualities, promote personal identification, stimulate emotion, and/or provoke action (Crilly, Maier, & Clarkson, 2008). The first three intentions are related to the function and use of the product and the rest related to the experience.

Analogies and metaphors are usually seen as a mapping between a source and a target domain (Fig. 5). The target domain is the domain to be understood (Hey, Linsey, Julie, Agogino & Wood, 2008).

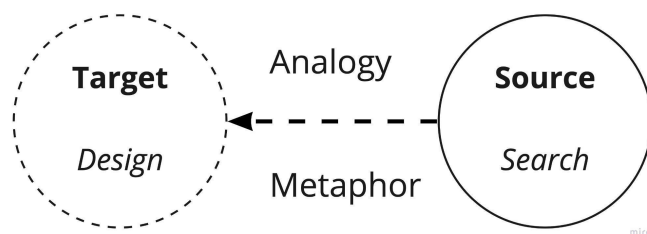


Figure 4. Metaphors and analogies map from a source domain to a target domain. (gathered from Hey, Linsey, Julie, Agogino & Wood, 2008)

3. Theoretical framework and hypothesis

3.1. Theoretical Framework

In this section, the relevant theories and key concepts will be presented, focused on proposed actionable strategies to achieve disconnection from work at home. This framework will allow the interpretation and analysis of future stages of this research. These strategies were selected during the literature review, cited from different authors in the field of psychology using different terms to describe them, therefore, in the following lines, they will be expanded, and we will seek to establish relationships between them.

According to Smit (2015), who's research is dedicated to explore why, how, and when employees will experience psychological detachment from work, "without a clear understanding of the mechanisms driving detachment, intervention efforts aimed towards promoting recovery will be impeded because it is unclear what the intervention should target." (Smit, 2015) Although literature has explored few solutions such as joint partner activities during weekends, mindfulness and volunteering, these practical recommendations for increasing detachment have not been tested for their efficacy and might not be adequate to implement on a daily basis. Smit argues that goals are theoretically relevant to psychological detachment "because of the varied and powerful ways they shape human cognition". For example, "research on the Zeigarnik (1927) effect documents how unfulfilled goals continue to capture attentional resources until the goal has been either completed or abandoned, which may have important implications for employees' ability to detach." (Smit, 2015)

Smit study *Successfully leaving work at work: The self-regulatory underpinnings of psychological detachment* (2015) provided supportive evidence for a specific, effective remedy for employees who have difficulty detaching from work, aiming to fill the gap in the literature providing concrete recommendations for facilitating detachment. This study illustrates that “creating specific plans for how to complete unfulfilled tasks frees employees attention to be directed towards other matters. Given how often employees transition between work and home roles, this simple, low-cost method has the potential to improve occupational health while preserving, or even improving, job performance on a daily basis” (Smit, 2015).

Goals are defined as “mental representations of end states that guide behaviour, as well as shape emotions and evaluations” (Smit, 2015). And when goals are complex and ambitious and cannot be achieved in a day, individuals are forced to keep them in mind and tend to resume them iteratively over the course of days, weeks, months, or even years. “Given that human cognition is strongly biased towards goal completion once a goal has been activated” (Förster, 2007). Therefore, unfulfilled goals remain active and accessible and consequently, those goals remain accessible, and when not achieved, can split attention and create distractions that disrupt activities in other domains. For example, “individuals may have difficulty disengaging from a work mindset and/or difficulty engaging in other roles due to continued work-goal accessibility.”

Another aspect is the “Implementation intentions” that reduces the accessibility of unfinished work goals. Implementation intentions are plans that describe with specifics on where, when, and how of behavioural goal pursuit (Gollwitzer, 1993). Such as stating, ‘When I finish working’ consequently ‘I will go to the gym’. Implementation intentions facilitate goal pursuit in several aspects, intentions eliminates the ambiguity of how specific goals should be accomplish and by

specifying the situational conditions that will prompt goal pursuit (i.e., ‘When situation x arises. . .’), implementation intentions both provide reminder prompts to work on a goal.

Practitioner points (Smit, 2015)

- Creating plans at the end of the day that describe where, when, and how unfulfilled work goals will be completed is an effective, low-cost intervention that enhances psychological detachment among employees, which will ultimately improve occupational health and performance.
- The planning intervention was primarily effective among employees who typically have difficulty detaching from work during leisure time, indicating that intervention efforts should be targeted at specific types of employees.
- When setting daily work goals, employees should be encouraged to focus on smaller, concrete goals at the end of the day in order to reduce unfulfilled work goals and facilitate psychological detachment.

In the study *Learning How To Recover From Job Stress* (Haun, Binnewies, Sonnentag, & Mojza, 2011) it is supported that recovery experiences are malleable and can be promoted through a training intervention. “Up to our knowledge, our study is the first one to show that recovery processes can be deliberately improved”, authors say.

The authors designed *The Recovery Training Program*, based on theoretical considerations and previous research, structured in four modules each according to the four recovery experiences (psychological detachment, relaxation, mastery, and control during off-job time identified by Sonnentag and Fritz, (2007), with group in individual exercises, provided by trainers using visual representations and printed material, they trained participants in forming implementation intentions, helping them

to form concrete goals (“If . . . then . . .”) “because research showed that forming implementation intentions fosters goal attainment” (Gollwitzer & Sheeran, 2006).

The trainers also explained to participants how to better manage their off-job time using time management techniques that have been shown as an effective intervention for spending time in activities one wants to pursue. In the psychological detachment stage of the training, participants were invited to solve a riddle, where it was shown how effective it was to intensively engage in an activity in order to detach from work. Afterward, participants shared the activities during which they easily forget their work. The trainers explained to participants how certain strategies for organizing one’s work can prevent thinking about work during off-job time. Participants were invited to reflect about *transition rituals* (Ashforth, Kreiner, & Fugate, 2000) that can help them to clearly separate work and nonwork time. In addition, the trainers presented some strategies to physically and cognitively separate work and nonwork (Kreiner, 2009).

Transition rituals, scripts and role schemas tend to emerge over time, easing the difficulty of role transitions and of re-entering roles following interruptions. “A script or event schema is a cognitive structure that specifies the typical (descriptive) or appropriate (normative) sequence of behaviours and events in a given goal-oriented situation or process” (Ashforth, Kreiner, & Fugate, 2000). Psychological and physical movement are facilitated by rites of transition and it involves likely a combination of attention and arousal, various rites of transition might help regulate attention and arousal. For example, commuting can be viewed as a rite of transition involving temporal and spatial boundaries. Role entry involves becoming psychologically and perhaps physically engaged in a role and is facilitated by rites of incorporation, for example, “an individual may routinely visit a neighbourhood bar for a drink after work. Exchanging greetings and pleasantries with other patrons and having his “usual” drink poured may serve as strong signals for the individual that leisure time

has commenced (Oldenburg, 1997). Ironically, the transition may be solidified by revisiting the prior role: recounting the day's activities may serve as a ritualistic means of summarizing and thereby attaining closure with the prior role.” (Oldenburg, 1997)

Role exit involves psychologically and perhaps physically disengaging from the role and is triggered by external and/or internal cues. Common external cues include the calendar and clock (Nippert-Eng, 1996) completion of a project or task, social signals, and requests. Common internal cues include "push" factors, such as a sense of closure, exhaustion, mood, guilt, and hunger and thirst, and the "pull" of the anticipated role to address push concerns or to otherwise provide a desired experience. Role exit may be triggered and facilitated by rites of separation, for example, “a commuter may begin to psychologically disengage from her home role and prepare for her work role by following her daily routine of showering, dressing in work attire, reading the business section of the newspaper over breakfast, and listening to traffic reports. The flow of the ritual creates a psychological momentum that effectively overcomes the inertia of the home role and eases her into the work role.” (Ashforth, Kreiner, & Fugate, 2000) and Disengagement from work at the end of the day “may be facilitated by a collective "winding down," where coworkers plan their next day's agenda, turn equipment off, rinse coffee mugs, and so on” (Nippert-Eng, 1996). Once the rites and psychological disengagement have begun, it may be very difficult to fully re-engage an individual in workplace issues, even if he or she is still physically present in the workplace.

In time, with repeated enactments of a transition script, both the cuing and the enactment of the transition process are likely to become relatively automatic or "mindless" (Ashforth & Fried, 1988), that is, performed with little conscious effort or awareness. The specific tasks become cognitively chunked together so that the

specifics are effectively forgotten relative to the more abstract, overarching subroutines. Therefore, the individual may transition easily from one role identity into another, as the author explains, the type of transition is related to the level of segmentation and integration of roles that the individual has.

Based on Boundary theory, the study *All in a day's work, at home* (Fonner, & Stache, 2012) analysed the cues and rituals that home-based workers used to facilitate transitions between home and work roles. And, as previously mentioned, this author also refers to Role exit is often triggered by cues such as calendars, clocks and the completion of tasks, as well as rites of separation such as clearing their desk or cleaning their coffee mug. Followed by rites of transition as means of moving psychologically, and sometimes physically, into a different role, examples include commuting or mentally preparing for the change in roles.

Finally, as individuals enter into a different role, they may engage in rites of incorporation, which signal the entry into the new role when the individuals may change from 'work clothes' into 'home clothes' for example (Fonner, & Stache, 2012). Throughout the study, with a qualitative approach open-ended responses were analysed regarding the complexities of how teleworkers manage the work-home interface and establish boundaries by responding to the following questions: "When you are teleworking, how do you mark the transition between when you are "at work" and "at home"? Are there clear markers (such as mental shifts, physical barriers or communication to your manager or family) that help you make the transition from one role to the other?" (Fonner, & Stache, 2012) Resulting in a set of four categories:

- *Space as cue for role transition*

"The predominant strategy involved teleworkers physically leaving the space associated with one role and entering space associated with another.

Teleworkers signalled entry into their work role by exiting the 'home' space and

entering a space designated specifically for work.” The majority of respondents, has an office space separated from the rest of the home, using physical barriers such as doors, to delimit the workspace and communicate that is an off-limits space to the other household members.

- Time as cue for role transition

Using routines to segment work from personal time, facilitating role exit and entry and communicating their schedule to managers, colleagues and family in order to role transitions at specific times during the day. In addition to using temporal routines to cue role transitions, the use of breaks to mark structured transitions from conducting work to focusing on personal roles. These breaks enabled teleworkers to exit work roles and enter personal roles within the scope of their ‘workday. “In general, teleworkers relied upon temporal routines and ‘clock time’ to delineate time spent on work versus home roles. Using breaks allowed teleworkers to deviate from their strict temporal routine and integrate work and personal roles as necessary but to maintain control over their role transitions during the day.”

- Technology as a cue for role transitions

Becoming ‘connected’, engaging in a symbolic rite of passage that signifies the shift from the home domain into the work role. Connectivity and the association with being available and log in into the organizational network, using work equipment (e.g. laptops, phones). And in the same way re-entering the home domain by disconnecting, logging off and discontinuing the use of the equipment.

- Communication as a cue for role transitions

Proactively communicating in order to encourage segmentation and facilitate role transitions. For example, some communicate with colleagues to indicate when they are exiting their work role, such as sending an email when they are

taking a break or done working for the day. “Communication can be used as a rite of passage to facilitate the movement between roles and to reassure work contacts that the role transition process is being managed with a continued focus on productivity and—if relevant—teamwork and collaboration.”

The category proposed by Fonner and Stache (2012) coincides with preceding category proposed by Kreiner, Hollensbe, and Sheep (2009) documenting the tactics used by workers in order to manage work-home boundary work, and it differs in the following aspects; Instead of technology, it refers to a wider category called “Behavioural tactics” that includes *leveraging technology* as well as *Using other people* highlighting the role of “border keepers” that refers to other individuals that help to maintain these boundaries, such as colleagues, family and friends. And expanding on spatial cues, by naming them *Physical tactics* incorporating the concept *Managing artifacts* referring to using tangible items, such as calendar, keys, photos, etc to separate or blend aspects of the two domains.

The researchers found evidence that these tactics could be often complementary, “That is, we suggest that the tactics reinforce each other, creating a multipronged approach to negotiating the work-home boundary. In addition, one behaviour can cue multiple tactics.” (Kreiner, Hollensbe, & Sheep, 2009). These tactics are used as mechanisms to delineate the work–life boundary and aid transitions between roles. Compensating between the arrangements of flexibility and structure, that paradoxically demand the home office dynamics, while negotiating the “ideal” level of balance between the two domains (Fonner, & Stache, 2012)

3.2. Summary of strategies

Figure 6 summarizes the strategies that have been identified during this stage of research.

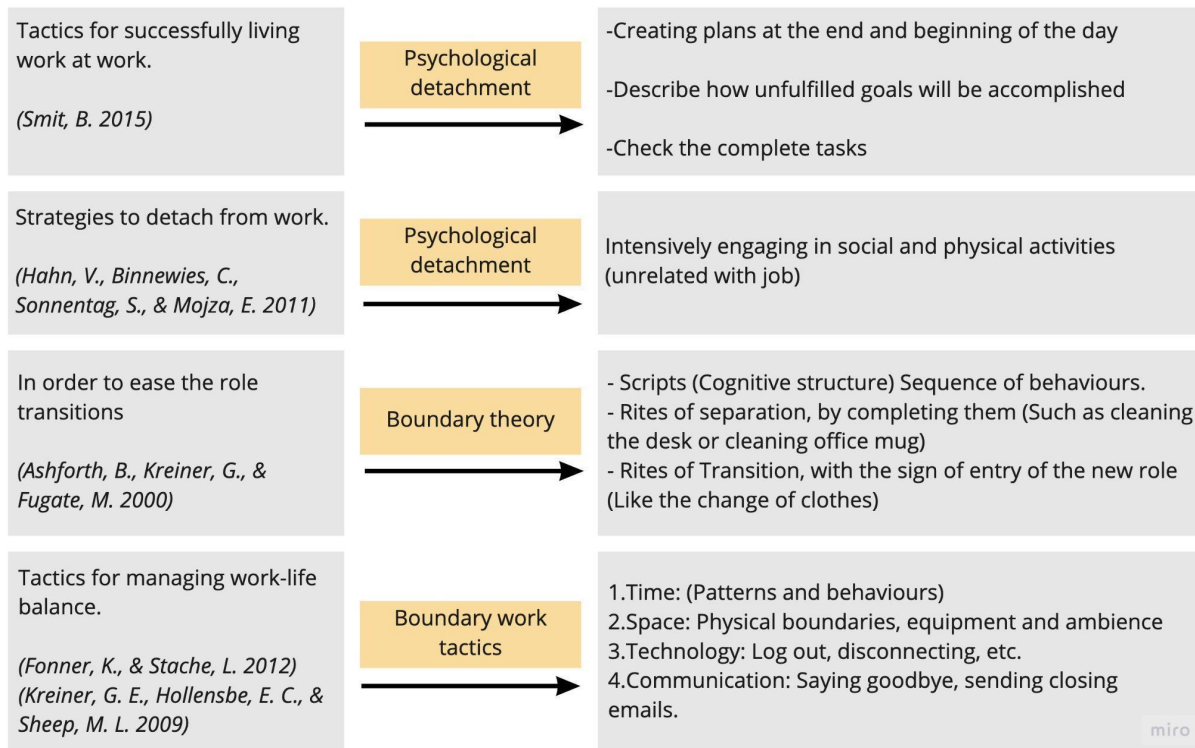


Figure 5. Summary of strategies.

3.3. Hypothesis

By implementing the proposed strategies previously presented, incorporating them to the design of an “Artifact” that embodies one or few of the cues that mark the role transitions, between homework domains, we expect to be able to help home-based workers achieve psychological detachment improving their health and wellbeing conditions.

- The state of Psychological Detachment from work can be increased through the design of physical artifacts created with this specific intent.

Dependent variable: The state of Psychological Detachment from work

Independent variable: The design of physical artifacts

4. Design Research

4.1. Sense Intent

According to Forbes article on “10 Remote Workplace Trends To Look Out For In 2021” (Retrieved on March 19, 2021), a Growing Respect For Non Work Times, referring to a recent survey by Kentik found that 51% of employees are concerned about their work-life balance - “Employers need to wake up to these facts and set clear rules and guidance about avoiding calls after work hours or requests that need an immediate response. In 2021, I expect to see app blockers and end-time emails become more common as people settle into their remote work roles.”

The growing concern about mental health and individual well-being, have caused that companies, employers and individuals, focus their energy on transforming the work culture into a more considerate and balance with individuals lives, overcoming the “always-on culture” and supporting the ability and the right that each person it's entitled to perform activities outside work and have the tools to manage work-life balance and create boundaries.

4.2. Research

4.2.1. Know the context

In the search of references in our current context we couldn't find available tools and products created with the specific intent of enabling Psychological detachment, nonetheless there are a large number of tools and products developed with other

objectives within the same area focusing on improving work conditions and specially managing time with the goal of increasing wellbeing. Many of these products also aim to create healthier habits, to highlight the importance of developing routines and daily planners, managing time and expectation in order to achieve productivity, all of these factors directly affect the chances of effectively disconnecting from work and achieving Psychological detachment.

Time management tools

One of the most known tools for time management is the Pomodoro technique (see Figure 7), it's main purpose is providing a simple tool/ process for improving productivity, by alleviating the anxiety of time passing, diminishing distractions and boosting motivation and determination to achieving goals while increasing awareness and self-evaluation. The technique consists in defining the tasks at the beginning of the day and setting for each one of them one or several 25 minutes intervals (called "Pomodoros"), having small breaks of 5 minutes between one activity and another and after every 4 pomodoros a taking break of 15-30 minutes, all this being setup in the tomato timer (Pomodoro, commonly used for culinary purposes), and using a paper sheet and pencil for marking the complete tasks with an X after each pomodoro.

There are available a great number of apps and softwares that are based on the use of the Pomodoro technique in the digital environment such as Pomodor and Marinara timer that are web-based apps to mention a few or simply setting the timer on smartphones or digital watch to track time intervals, however the author and creator of this technique Francesco Cirillo, refers that the most effective kind of Pomodoro would be the mechanical timer, mostly because the physical act of "Winding up the Pomodoro is a declaration of your determination to start working on the activity at hand" (Cirillo, 2018) as well as making time visible and audible, hearing the ticking sound and the signal that time's up and observing the remaining time.

The Pomodoro techniques also increase Psychological Detachment, as the author Cirillo remarks “frequent breaks with the Pomodoro are essential to achieving more lucid, conscious, and effective mental capacity resulting in increase in productivity. Detachment enhances the value of continuity” (Cirillo, 2018). The authors also refers that many people that use this technique have begun to understand the value and effectiveness of detachment, getting used to regularly stopping and disengaging from continuous work situations, encouraging consciousness and concentration. “It’s been proven that 20 to 45 minute time intervals can maximize a person’s attention and mental activity if they are followed by a short break.” (Cirillo, 2018)

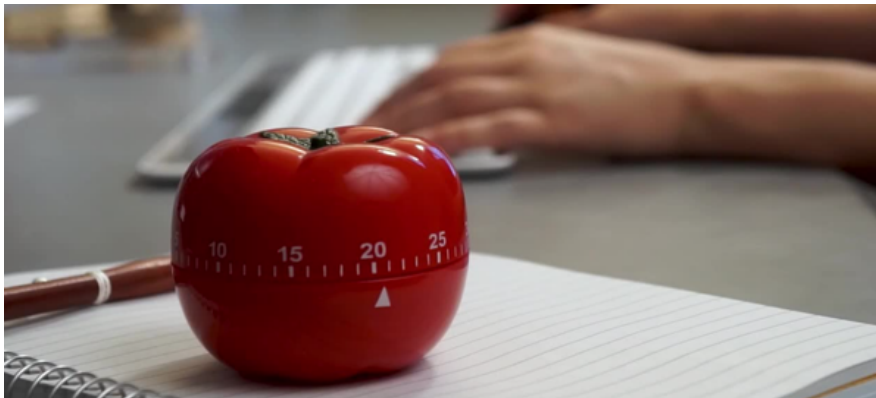


Figure 6. Pomodoro technique (Retrieved on 7/9/2021, from <https://blog.nfocus.co.uk/the-pomodoro-technique-an-agile-way-of-working>)

There's also worth mentioning an app called Forest that combines the Pomodoro technique with the challenge of reducing phone usage and diminishing distractions, while conducting tasks for a determined period of time. In a very easy and intuitive way, the app invites the user to set up a time to focus, choose the type of tree to plant, and the tree grows when the time is up, as long as the user don't leave the app while the three is growing, otherwise it will die, preventing them from using the phone in focus time. In this case, adding the factor of guilt and

disappointment when not achieving the ultimate goal seemingly “Growing a tree” while actually focusing on the task at hand and being present, until with time and repetition the habit of concentration is established.

The *Time Timer* (see Figure 8) is a visual tool designed to “show” the passage of time through the use of a patented red disk that disappears as time elapses, facilitating the reading of the remaining time that was determined for the task, increasing productivity by creating a sense of urgency.



Figure 7. Time Timer® (Retrieved on 7/9/2021, from <https://www.timetimer.com/products/time-timer-3-inch>)

Tasks and activities management tools

One of the most popular tools for Tasks (Project) management is *Trello*, a web-based, Kanban-style, list-making application that in a collaborative way organizes projects into boards. In one glance, Trello tells the user what's being worked on, who's working on what, and where something is in a process. Also, very similar to Trello, there is Asana and many more tools and apps that help manage tasks between teams or individuals.

And for tracking or managing personal affairs other than working, followed by the expression “there’s an app for everything” seems like there is, just as a quick recount on the different approaches and uses of available tools:

- Tracking habits, goals and routines: StickK, Habitica, Habitshare, and others.
- Healthy habits (water intake): Smart watches, Daily Water Tracker Reminder, Hydro Coach, WaterMinder, and others.
- Breathing and meditation: Headspace, Calm, Inscape, and others.
- Setting goals and intentions: Coach.me, GoalsOnTrack, Way Of Life, and others.
- Tracking tasks and creating to do lists: Todoist, TickTick, Things, and others.

All of these tools are very useful to know the various products that exist to meet the needs around the constant search to improve work conditions and maintain a work/life balance, only in this case we will focus in particular in finding a solution for the end of the work routine that aims to help achieve the PD.

4.2.2. Know people

In order to complete the understanding between scientific research and a real case situation, the plan is to get an understanding of the defined archetypes that could interact or use our final product. The final goal is to obtain insights from their experiences, combine that with the conclusion in the previous stage of the literature review, and document the insights resulting from this.

Research questions:

- RQ1: What patterns in daily routines of remote workers working from home, can be seen as an opportunity for implementing a design solution?

- RQ2: What are the most common strategies implemented by users for achieving psychological detachment, and maintaining the work-home boundaries (or not)?

4.2.2.1. Questionnaire

It was decided to conduct a questionnaire, in order to collect qualitative and quantitative information. The main objective is to learn about the process and experiences of people in relation to their ability to disconnect from work at home, focusing especially on the strategies applied by users to achieve psychological detachment. As well as a tool to select candidates for future stages and to identify areas for further research.

The questionnaire was built using as reference the key literature reviewed referring to individuals' management of the work-home boundary (Nippert-Eng, 1996; Ashforth, 2000). The codification and classification of open-ended questions was based on the categories of "Boundary work tactics" created by Kreiner (G. E., Hollensbe, E. C., & Sheep, M. L. 2009).

Sample

The data was collected from a total of 59 people, 56% (N=33) female and 44% (N=26) male, 45% (N=26) in the age ranges of 31-36 and 29% (N=17) of 25-30, 26% (N=16) of them living in Portugal, 20% (N=12) Argentina and other percentages of people in Brazil, Spain, UK, Germany, and Finland. 90% (N=53) working from home full time (+40 hours per week) and 75% (N=44) only since the pandemic started in 2020. Working in the industries of computer & IT 17% (N=10), Marketing & advertising 17% (N=10), Arts and design 14% (N=8) and Public administration services 14% (N=8) among others. 76% (N=44) working as Mid-level professionals and 65% (N=38) in companies that have +250 employees.

This study had no specific target because when the survey was launched (January 18, 2021), many people around the world were working from home due to pandemic imposed restrictions and we were interested in getting feedback from a broader perspective and context. Thus, the form was shared through different channels such as social media to acquaintances and within different circles of IADE and other professional areas, locally and internationally.

Instruments

To gather quantitative and qualitative data, the tool used was an online questionnaire that was conducted using Google forms; composed of open-ended questions and closed questions (polytomous) by choosing one of the alternatives of simple selection, all of them with the possibility of “other” for adding an answer. The open-ended responses given by respondents, describing their experience and their strategies for managing role transitions were contrasted with literature, in order to codify and classify after the content analysis based on the categories of “Boundary work tactics” (Kreiner, Hollensbe, & Sheep, 2009).

Procedure

The online questionnaire was created on Google forms and was consequently shared through social media and Whatsapp in order to find respondents. After receiving the 59 responses within three weeks, it was decided to continue with further analysis of the data. Coding and analysing the open-ended responses to group them according to the categories proposed by the literature.

Results and discussion

On the question referring to where the workspace is located at home; 48% (N=28) of the respondents indicated that they work from the Dining room/ Living room space and considering that only 10% (N=6) of the respondents lives alone, workspaces are located mainly in common areas and shared spaces with other household companions including partners 53% (N=31), roommates 22% (N=13) and partner and children 15% (N=9). This context presents serious challenges for homeworkers to manage boundaries, especially physical boundaries toward home and work life, given that they share the same 'core' space.

As well as the case of the respondents that indicated that their workspace is located in their bedroom space 24% (N=14), as one of the participant stated in the open comments section of the survey "It's really difficult when you have your workspace in the bedroom, it's such a personal space to others to see (in call meeting for example) and at the end of the day you don't feel 100% comfortable in the room (you lose the feeling of cozy space)" In this case, work invades personal space and compromises the environment that oppositely is destined for relaxation and rest, increasing the difficulty of maintaining physical and mental boundaries. Working from an established space, preferably separate and delimited from the rest of the house, is recommended in order to maintain at least the physical limits, which also contribute greatly to the psychological ones, and this is the case of 22% (N=13) of the respondents that carry out their work from a Studio/Office.

According to the survey 82% (N=48) of the respondents agrees with the importance of having work-life boundaries, and the most common ways to manage these boundaries are; Ignoring work related email and phone call outside work hours 38% (N=22), Maintaining strict work hours 29% (N=17), Having a separate workspace from the rest of the spaces 21% (N=12). Related with the previously mentioned

strategies; leveraging technology and communication, managing time and space, respectively (Fonner, & Stache, 2012).

Regarding their work-life balance 'appreciation' while working from home, it is interpreted as a contradiction, on the positive or beneficial side of the aspects of working from home 60% (N=35) of the respondents agreed with the statement "My work-life balance has improved since I work from home" and 70% (N=41) agreed with the statement that "Now that I work from home, I feel like I have more time for my personal activities" while on the less positive side 64% (N=37) agreed with the statement "It feels like I'm working longer hours now that I work from home instead of the office" and 85% (N=50) agrees with "When you work from home, it is difficult to know where the work ends".

The appreciation that being at home gives the opportunity to conduct more personal activities compared to being in the office, but actually resulting with the feeling of working more hours (overwork) and having the difficulty to end the work day to resume those personal activities. It is important to highlight that 67% (N=39) agreed that "I miss commuting, I used to disconnect from work on the way home" due to commuting being one of the seamless and effortless ways of physically and psychologically disconnecting from work, having a clear structure and (space) separation, delimiting where one ends and the other begins.

With the purpose of recollecting the strategies used among the respondents in order to disconnect from work at the end of the day, in an open-ended question, they were asked if they had any routine or activity that helps them take their mind off work after finishing working and to explain what it was. The responses were further analysed and subsequently grouped into the categories as shown in Figure 9.

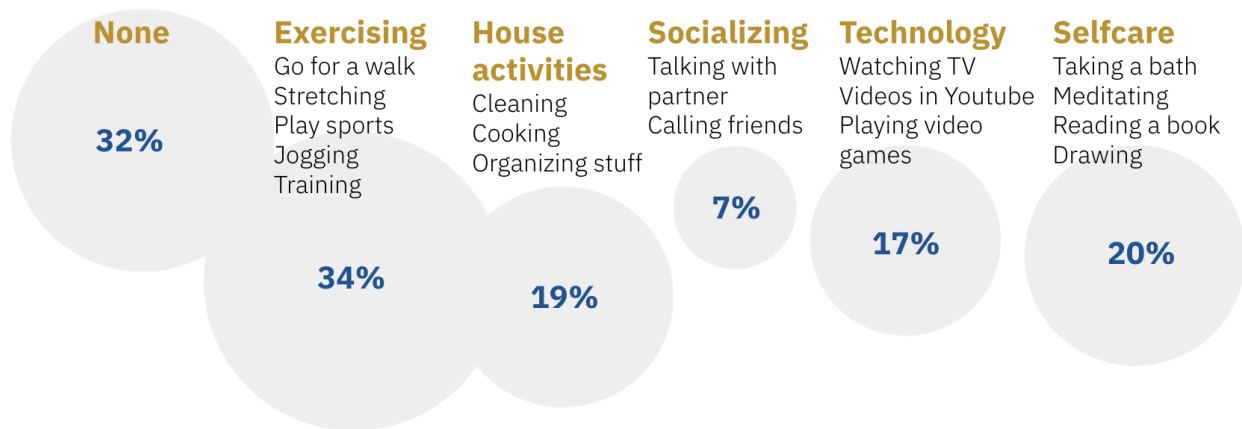


Figure 8. Categories of strategies indicated by questionnaire participants.

Exercising is the most common strategy used for disconnecting from work at the end of the day with 34% (N=20), including going for walks, stretching, training, and playing sports. Mainly because it is a highly engaging activity that requires attention and a specific set of conditions, that provides transition rituals between activities. 32% (N=19) of the respondents said they did not have any routine or activity (None), this would possibly refer to not having a routine because they do different stuff everyday or not having recognized an activity that helps them to disconnect. 20% (N=12) of the respondents mentioned activities related to relaxation and self care such as taking baths, meditating, or reading in order to conduct the transition from work. As well as house activities, technology and socializing related activities.

An analysis was carried out in order to identify marks or cues that determine the role transitions from work at home, participants were asked to choose between the following options, which would normally be the most important change they make to mark the transition of when they finish work, and the answers were; 57% (N=34) Leave or change space, 21% (N=12) Change of settings (Like lights or music), 17% (N=10) change clothing. Highlighting once again the importance of the physical boundaries by changing the space and the conditions of the environment to mark the transitions.

The open-ended questions referring to how the respondents usually start and end the work routine at home is meant to recognize patterns, and routines that help us identify the most common signifiers or transition marks between roles. The categories used in order to classify the answers is based on the Boundary work tactics (Kreiner, Hollensbe, & Sheep, 2009) as shown in Figure 10 and Figure 11 referring to the beginning and the end of the work routine, accordingly. The beginning of the work routine is closely related with the use of technology (open the computer and apps and log in) 93% (N=55) and is also relevant to the communicative category (Talk to colleagues, open chats, send mails and messages). The end of the routine is also related to technology 54% (N=32) nonetheless in this case is almost as equally important as the relevance of Time (Task and schedule) 34% (N=20) and Space (Organizing, cleaning and making changes) 36% (N=21) tactics categories.

Beginning of the Work routine

Categories based on the Boundary work tactics (Kreiner, G.E., Hollensbe, E.C., & Sheep, M.L. 2009)

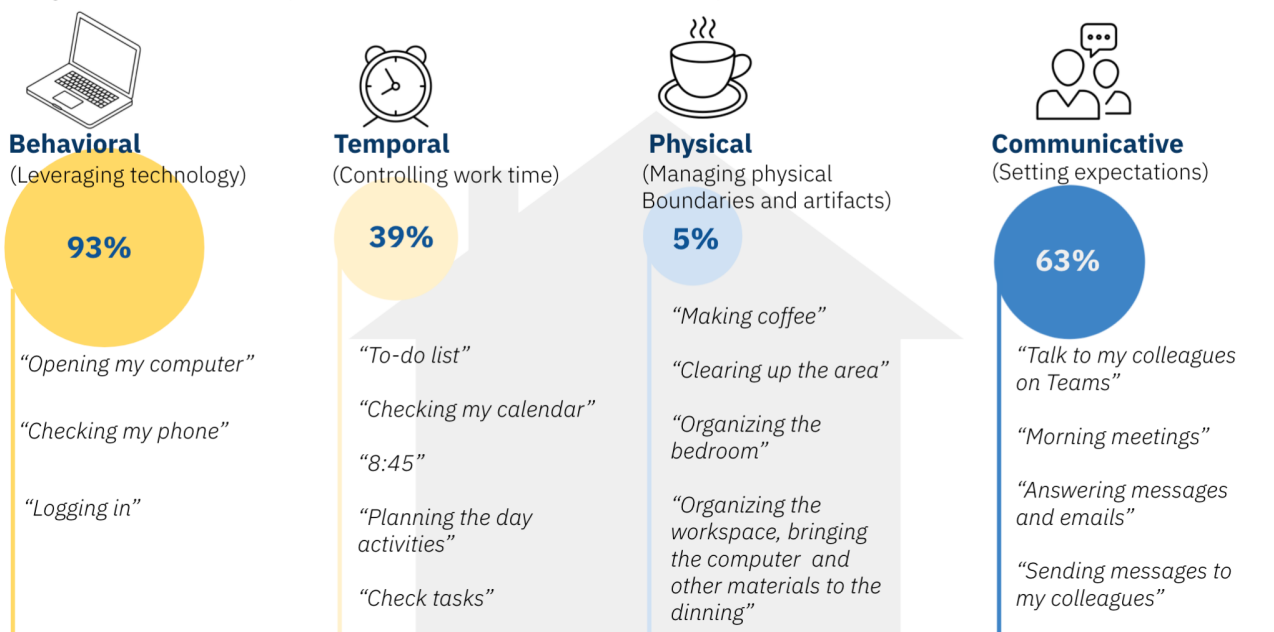


Figure 9. Beginning of the work routine summary of respondents' answers, according to the categories proposed by Kreiner, Hollensbe, & Sheep (2009).

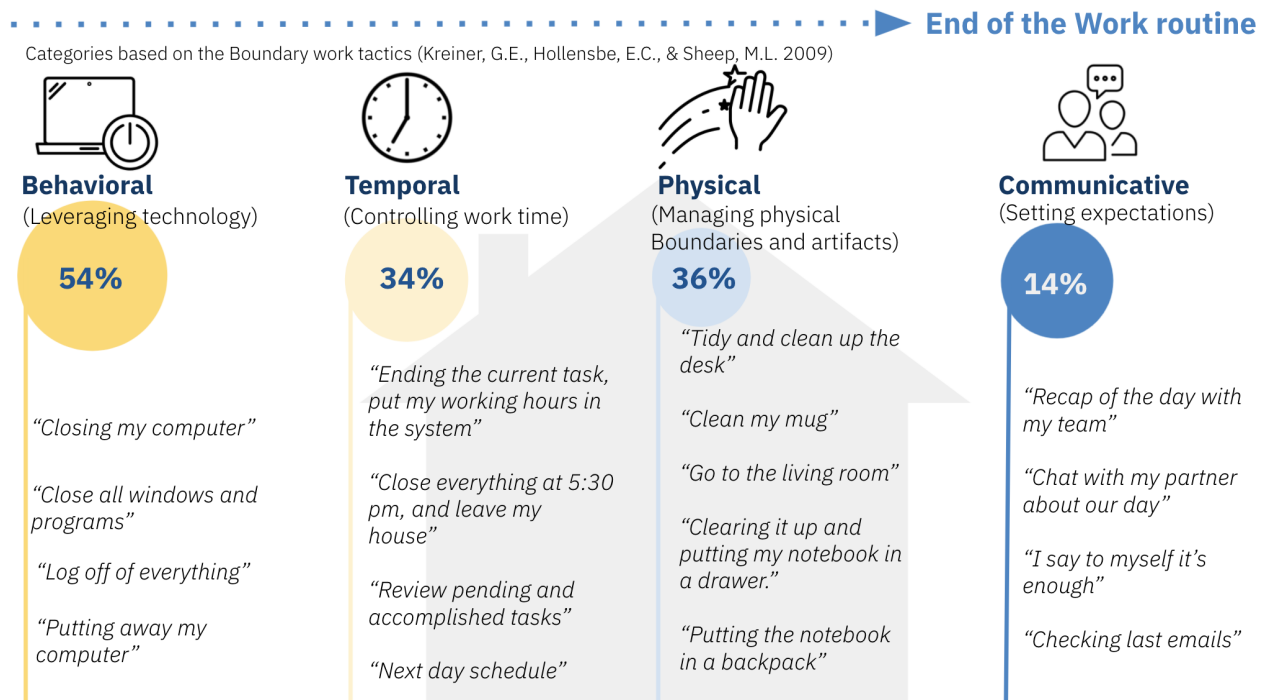


Figure 10. End of the work routine summary of respondents' answers, according to the categories proposed by Kreiner, Hollensbe, & Sheep (2009).

4.2.2.2. Ideation workshops

After analyzing the results of the questionnaire, we decided to convene some of the respondents to participate in Workshops, that had a dynamic of an ideation session. This was intended to open a direct dialogue on how this difficulty was being handled and could be handled in the future, directly with the affected users (at different levels) and to compare the results among them and collect their ideas, strategies, and thoughts.

Sample

Nine participants were invited to take part in the conducted online workshop, they were among the previous questionnaire respondents, and left their emails to be contacted for a possible next stage of the study. They were selected according to the level of psychological detachment that was indicated by the participants in the question #19 of the previously conducted questionnaire; “Would you consider that you have difficulties keeping your mind off work in your free time?” responding within the scale of 1 - 5, being 1 (Strongly disagree) and 5 (Strongly agree). The participants were distributed in three groups according to their stated level of psychological detachment (response given on a 5-point scale) - (5) Group 1: Low detachment 21% (N=12), (3) Group 2: Medium detachment 14% (N=5), (1) Group 3: High detachment 3% (N=2).

Three people of each group (see table 3) were consecutively contacted through email, proposing a tentative date to hold the workshop, according to the time zone and for one hour on the weekend, after receiving the confirmation the official invitations were created according to their availability.

Table 3. Participants’ demographic characteristics

Level of PD	Name	Gender	Age range	Occupation sector	Location
Low	Emily	Female	31-36	Medical health	Argentina
	Juan	Male	37-42	Computer & IT	Argentina
	Pedro	Male	37-42	Computer & IT	Portugal
Medium	Maisa	Female	25-30	Creative arts & Design	Portugal
	Ana	Female	37-42	Creative arts & Design	Portugal
	Kelly	Female	31-36	Education & training	Brazil
High	Veronica	Female	31-36	Computer & IT	UK
	Andrea	Female	25-30	Public services & Adm.	Argentina

Instruments

In order to gather insights and develop ideas on products that could help increase the level of PD based on close personal experience about the subject according to their own strategies, three online workshops were held in a collaborative platform called Miro, each session took part with the three different levels of PD identify (low, medium and high).

The categories suggested, as a starting point, to develop ideas for solutions on “How can we help Ana to achieve her goals?” are based on the categories of “Boundary work tactics” created by Kreiner, Hollensbe, and Sheep (2009). Ana was the developed persona that portraits the characteristics and struggles of the Low PD and was presented in the workshop as the person who we are “helping out” and developing ideas for, creating empathy and the perspective of an outsider. And Ana’s goals were related to improving her work life balance, time management, and the ability to disconnect after work at home.

Procedure

Previous to the workshop, the link of the scheduled Skype meeting was sent to the participants together with the invitation to share the working board in Miró, in order for them to create the account in advance and carry out the activity. The duration of the workshop was one hour in the three sessions, and was structured in three parts, the first one was to welcome the participants and give them a brief presentation of the thesis and the exercise to be done, then a small dynamic was proposed to teach them how to handle Miro and to break the ice. The activity consisted of going to the Miro wall where each participant was assigned a colour of post-it note, and were asked to look at their workspace at home and name 3 things they have on their

desk; “One that you need for work (Other than the computer)”, “One that you like a lot” and “One that shouldn't be there”.

The second part was focused on briefly explaining the problem; Keeping our minds from work in our free time. Showing them a 7 minutes-long video, summarizing the background of the problem, what we know so far and some key concepts to understand it, briefly introducing them to Ana, the person who represents the Low level of PD extreme case. Then, in order to evaluate how this problem affects each one of them, in a 10-minute session, the Hopes & Fears exercise was developed, where each participant freely expressed what they hoped and feared if they were to continue working from home.

The third part had a duration of 20 minutes including 5 min for presentation and was dedicated to ideate possible solutions for Ana's problem, participants were asked to put themselves in Ana's shoes and think of the question “What artifact from the future will help Ana to achieve her goals?”. And with the structure of “Ana would like to have a... So that she can...” each of them completed as many ideas as they could according to the three proposed categories; Time management, healthy routines & well-being, Managing physical space, furniture & decorations, Communication & technology. Example; (Communication & technology category) “Ana would like to have a device that reminds her when she has to finish work. So that she can be aware of her time.”

Results and discussion

The three different workshops with the three groups according to their level of detachment resulted in three boards filled with ideas for helping “Ana”, with her problem of keeping her mind of work, as shown in Figure 12. After each participant explained the ideas presented on the board, they were assigned to five red dots to

“vote” for their own or other participants' ideas that they liked the most in order to narrow down the list.

What artifact from the future will help Ana to achieve her goals?

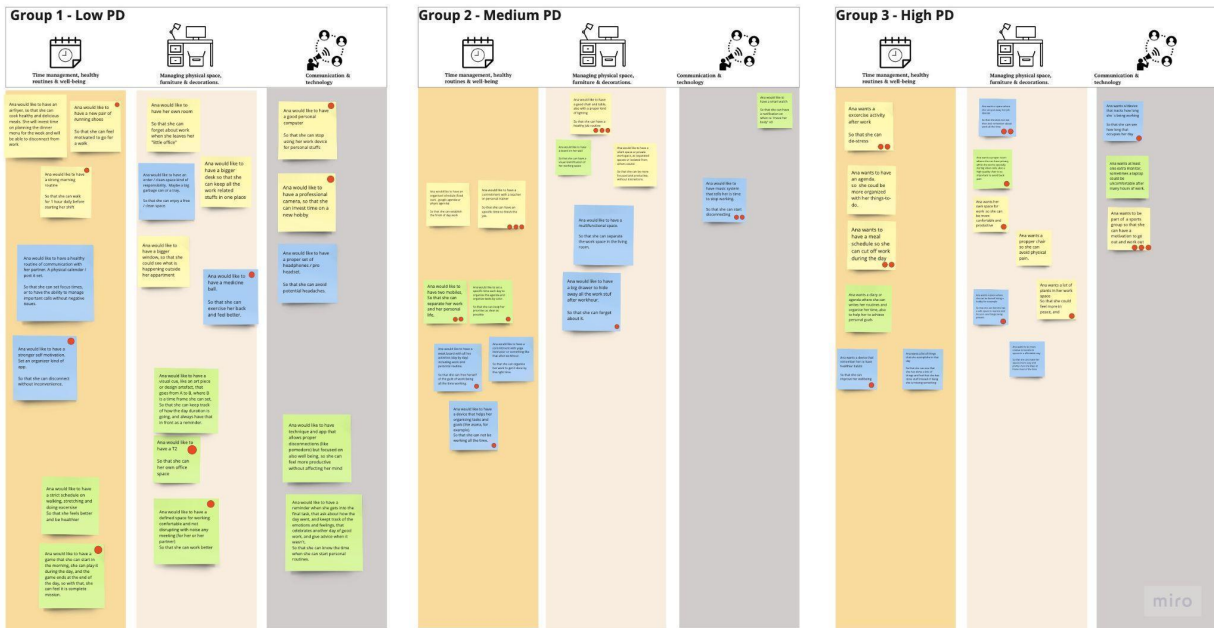


Figure 11. Workshops ideation boards (See detail of contents in Appendix III)

It was interesting to see how the ideas that each participant gave for helping Ana, were inspired by their own strategies and needs, and according to their level of detachment was notorious the level of detail for these strategies. For example, the group with the high level of detachment had very practical and straightforward solutions, mostly because they found effective ways to achieve PD, such as; “Ana wants a list of things that she accomplished that day, so that she can see that she has done a lots of things and feel that she has done stuff instead of feeling she is missing something” or “Ana wants to be part of a sports group, so that she can have a motivation to go out and work out”. On the contrary, the group with low levels of PD provided solutions mostly focused on their own very specific needs, other than concrete strategies, for example; “Ana would like to have technique and app that allows proper disconnections (like pomodoro) but focused on also well-being, so she

can feel more productive without affecting her mind” or “Ana would like to have a defined space for working comfortable and not disrupting with noise any meeting (for her or her partner), so that she can work better”.

4.3. Analysis

4.3.1. Frame insights

After learning about routines and peoples experience of what causes low psychological detachment when working from home and how do they manage it, we were able to identify two main components (see Figure 13); Physical component: On something tangible such as time that can be measure and productivity that can be evaluated in different ways according to completing task or achieving goals, and the second component has to do with the psychological side; acting thought the fear of losing the job, or having negative emotions of performing poorly or to simply not feel productive enough.

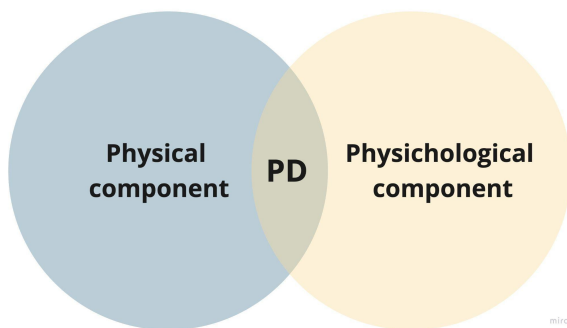


Figure 12. Psychological Detachment components identified through research.

After breaking the continuous working without boundaries, that leads to overwork and prevents or creates difficulty to achieve Psychological Detachment of people working from home, we wondered what's behind overwork? And after the workshop

sessions we were able to identify, from the interpretation of the participants' comments, the following aspects:

- The guilt factor, to demonstrate that you are a great worker.
- The sense of not being productive enough
- Or simply because they have too many things done for tomorrow's deadline.
(Matter of organizing time and manage expectations)

4.3.2. Personas and User Journey

Based on the information gathered throughout the conducted Questionnaire, three personas were developed, as fictional characters that synthesizes the collected information, in order to represent the three potential user types identified according to their level of detachment (Low, Medium and High) previously mentioned.

Psychological detachment:



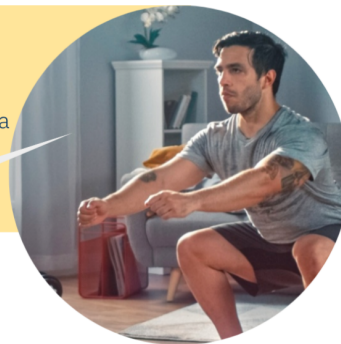
Ruben's Story

Age: 28

Location: Buenos Aires, Argentina

Living situation: He lives in TO apartment alone.

***"Exercise,
that's the key"***



Frustrations

- Working alone everyday, missing coworkers
- Being stock at the house all day
- Not doing physical exercises
- Having work related calls outside office hours

Bio

He works in a large department in public services and administration, he has been working from home full time since the pandemic started in 2020.

He doesn't have a fixed space to work, since he lives alone he moves around the house freely, he is very strict with his hours of work, starts at 9am everyday and at 6 pm closes his computer and tries to leave his house to clear up his mind.

Motivations

He does a lot of training in his free time. That's what helps him to end work and make the transition. For him it is very important to have work-life boundaries, so for that he tries to ignore emails and phone calls outside office hours.

Goals

- Schedule exercises everyday
- Maintaining work-life boundaries
- Improve his work space

Figure 13. Persona 1: High level of PD

Ruben's persona is the High level of Psychological detachment extreme case (see Figure 14), it emphasizes the importance of having a highly engaging activity after

work as a strategy to easily and regularly disconnect from work at the end of the work day. As exercising was one of the most common activities used as a strategy to disconnect, and the phrase “Exercise, that’s the key” was actually a comment made by one of the participants with a similar profile that did not have difficulties keeping their mind of work.

Psychological detachment:

MEDIUM

Teresa’s Story

Age: 30

Location: Barcelona, Spain

Living situation: She lives in T2 apartment with roommates.

“I just close my computer, without even checking what’s open. It’s refreshing. :)”



Frustrations

- Working in her room invaded her privacy
- Having work stuff around her room
- Being distracted while working
- To manage time in order to get things done

Bio

She works in a small Design agency, and has worked from home for at least for four years, did freelance work for a while and now the agency allows flexible work arrangements.

She usually works in her room, because the common spaces are shared and she prefers privacy for focusing on her work. She has flexible work schedules, sometimes when she has deadlines finish later that usual.

Motivations

After work, she does the things she loves the most, like drawing, reading a book, or talking to a friend while listening to music.

Goals

- Having a separate work space other than her bedroom
- Keeping her room organized
- Having the ability to disconnect quickly to enjoy her free time.

Figure 14. Persona 2: Medium level of PD

Teresa’s persona is the representation of the Medium level Psychological detachment case (see Figure 15), having flexible work hours creates the difficulty of not having established hours to manage time as a routine to maintain boundaries, the work day becomes oriented towards goals or tasks that doesn't necessary respond to time, so the working continuous can be the main cause of having experience poor detachment occasionally.

Ana is the persona that represents Low level of Psychological detachment extreme case (see Figure 16), working from home seems to occupy her entire life, she is experiencing burnout symptoms caused by the extended work hours and a great deal of stress, the amount of work feels heavier and so she feels the need to continue working in spite of the number of hours, and her physical and mental condition, leaving her with no time or energy to perform personal activities and her mind keeps thinking about work issues in a regular basis, interfering with her personal relationships and wellbeing state.

Level of Psychological detachment:

LOW

Ana's Story

Age: 33

Location: Lisbon, Portugal

Living situation:

She lives in T1 apartment with her partner.

"Feels like there's no definite end, I'm always thinking about work."



Frustrations

- Working too much and feeling tired
- Without energy for personal activities
- Thinking about work all the time
- Having the feeling of not finish her task

Bio

She's a Account Manager in a new Portuguese small marketing firm, and she has been working from home since the pandemic started in March, 2020.

She usually work in the living room. This is becoming very difficult for her because she has a lot of video calls during the day. She also share the space with her partner, who is also working from home. She considers that there is a lot of task to fulfill and she has to stay after office hours regularly, as a result she's getting very tired at the end of the day. After work, she usually cooks dinner and does housework.

Motivations

Feeling better about herself, reducing stress and improving her personal relationships. Having the time for her personal interests.

Goals

- Improve her time management
- Having healthier routines
- Find a better work-life balance

Figure 15. Persona 3: Low level of PD

Since Ana will be the main user of our product that aims to help achieve psychological detachment, it is important to understand how is her daily routine on a usual day of working from home (see Figure 17); Ana wakes up at 8 am every day, unless she has an earlier meeting that is her usual hour set in the alarm, she brushes her teeth and gets dressed in comfortable clothes, then goes to the kitchen and toasts some bread and makes coffee, sits at the dining table in the living room,

which is where his workspace is and has breakfast while he watches some things on his computer, at 8:30 am she starts her work day, her logs in to the company's website, opens the chats to chat with her colleagues and starts reading and answering emails, she usually decides her lunch time to be from 8:30 am to 8:30 am: 30 am she starts her work day.

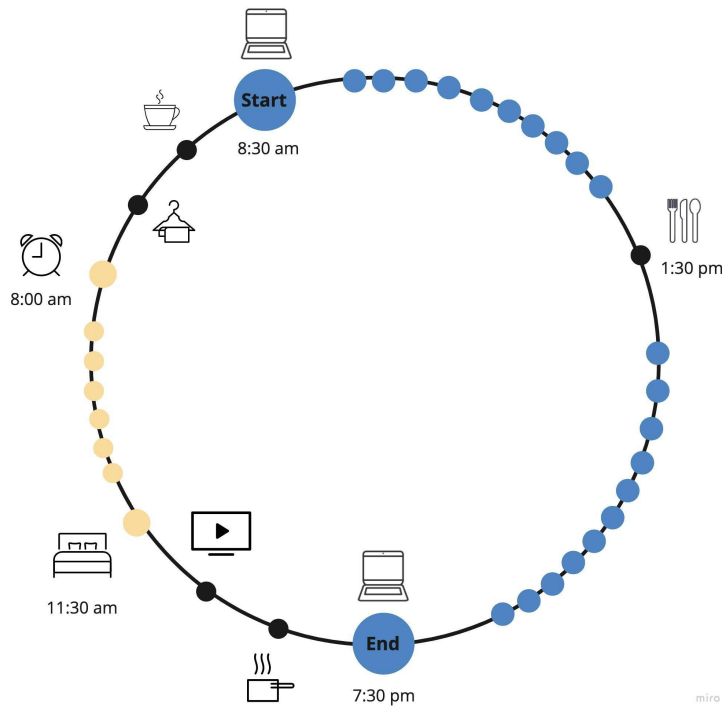


Figure 16. A day in Ana's life.

She logs in, opens the chats to say hello to her colleagues and starts reading and answering emails. She usually decides her lunch time according to the meetings she has. Sometimes she has only 20-30 min between meetings so she just goes to the kitchen for something quick to eat and then continues until the evening. She usually tries to finish the things she has pending no matter what time it is, sometimes she stops working because she is simply too tired or when her partner asks her to prepare dinner together, then Ana closes the computer and starts to organize some

things at home, eat some dinner and watch a TV show. Then, tired and feeling that she is still thinking about work, she goes to bed to sleep but it usually takes her some time to fall asleep.

4.4. Synthesis

4.4.1. Explore concepts

Searching for references on metaphors and strategies to change behaviours, the book *Switch* (2011) written by authors Chip Heath and Dan Heath consider the two components previously presented, the psychological and the physical as different systems that rule the mind and compete for control; The rational mind and the emotional mind. And proposes that change in our own behaviours can be led and encouraged by focusing on the three forces that influence it: the rider, the elephant and the path, as an analogy to our brain the rational rider, the emotional side and the environment consequently in which the change is supposed to happen. According to the authors there are 3 ways to influence change:

- Focus on one specific, critical aspect of the change, so the rider doesn't have to decide.
- Get the elephant moving with a powerful emotion.
- Make the path of change easy to follow because human behaviour is highly situational.

Based on this approach and in order to achieve greater influence in behaviour change, in this case specifically on PD after work at home, aiming to propose and develop concepts of physical artefacts that can enable PD each concept must include these three forces previously mentioned.

In relation to the exploration of concepts through metaphors, several questions arose during the workshops with the participants and also referring to the answers by respondents of the online questionnaire carried out: “How do you usually end your workday at home? (Example: Clearing out your schedule and cleaning your mug, etc.)” referring to what emerged from participants' comments, it was important to explore what would be the physical representation or form of these concepts. For example: What makes you feel you are done working?

After the workshop, taking into account some of the actions mentioned by the participants that for them symbolized the end of the working day and what balance represented, and after considering some of the most culturally representative stimuli of the end of the working day, a brainstorming session was held, resulting in the proposal of boards of references that symbolize the end of the working day (see Figure 18) and the balance between working time/YOU (Figure 19). This, with the intention of building a “toolbar” to be used in the next stages in order to incorporate these symbols in the development of the concepts.

What makes you feel you are done working?

“END OF SHIFT” Metaphor (Intent)

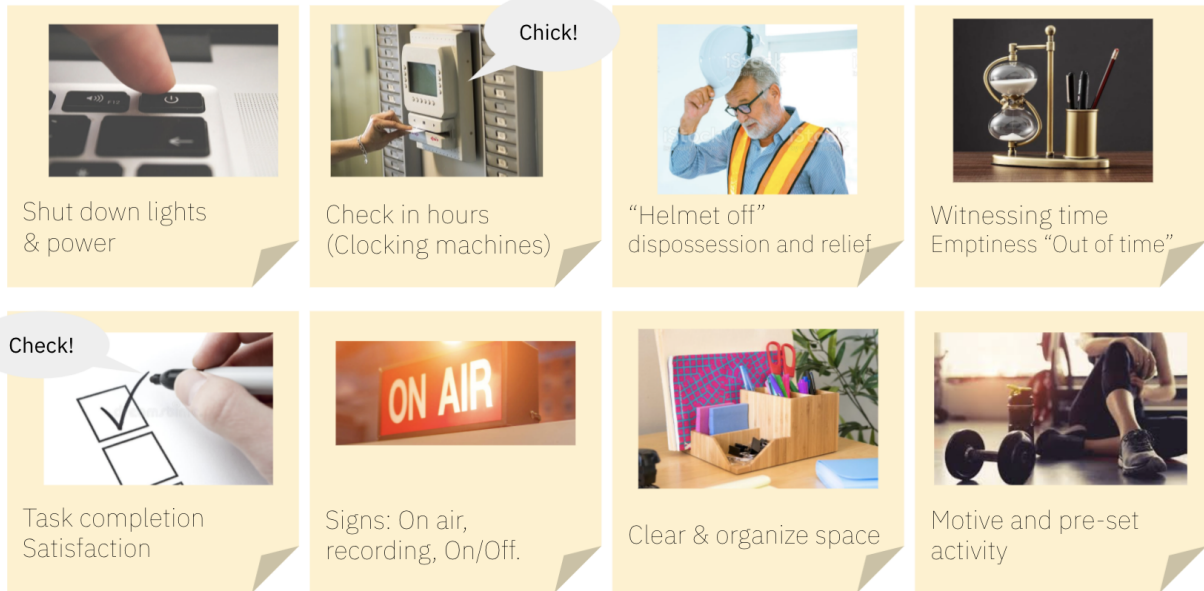


Figure 17. “End of shift” proposed symbols

How to externalize goals and motivations?

“Balance between WORK/YOU time” Metaphor (Intent)

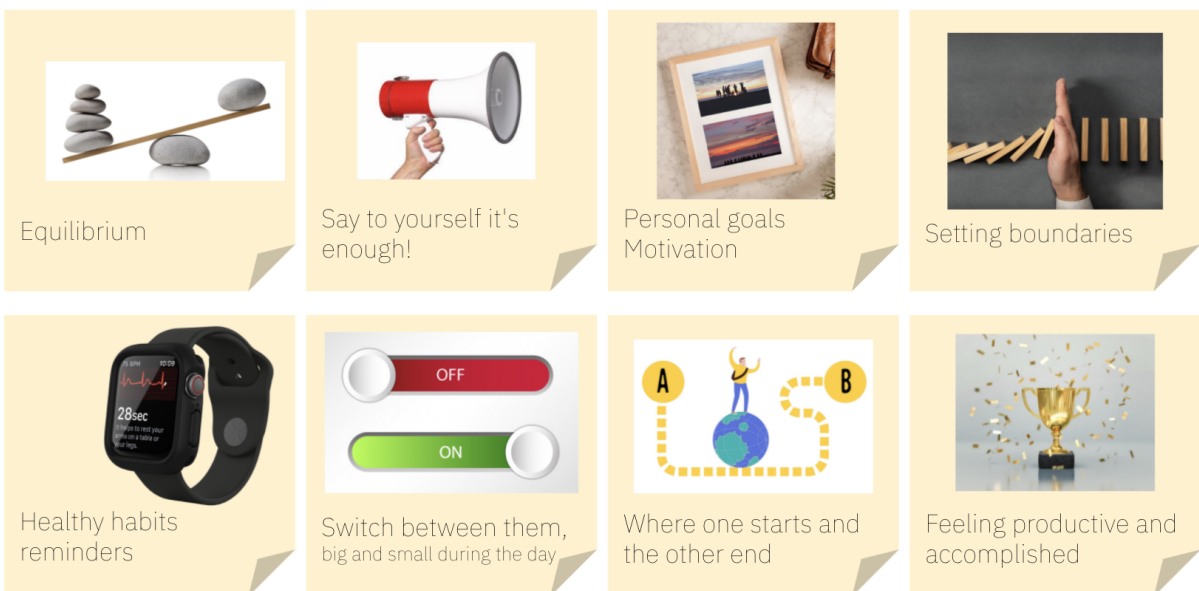
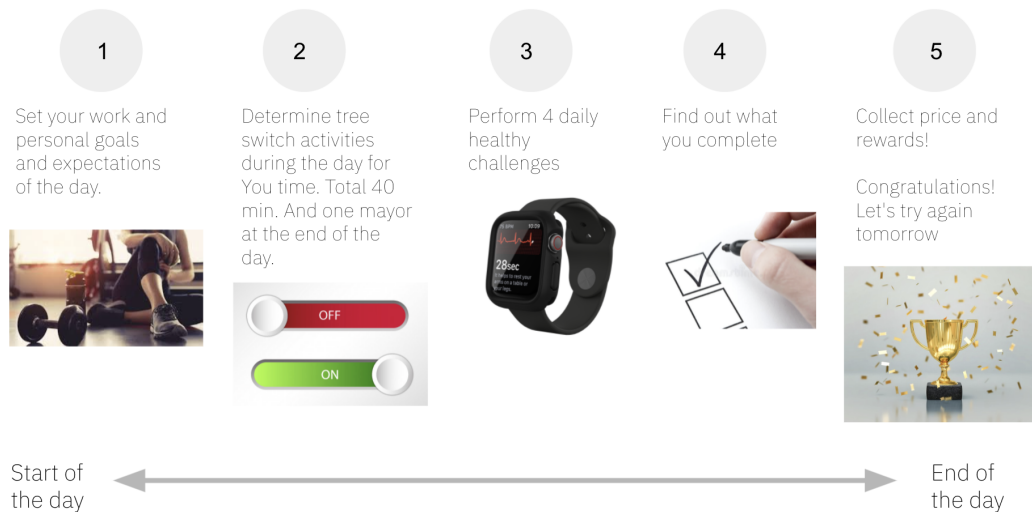


Figure 18. “Balance” proposed symbols

After synthesizing the proposals that emerged during the workshops, we proposed a concept development phase that began by defining three different concepts as starting point: a game (see Figure 20), a totem (see Figure 21) and a visual mark (see Figure 22). Each of them including one or many elements, such as symbols and metaphors and used them as triggers for brainstorming possible artifacts according, the what, why and how questions and adding the “Something on the wall” and “Something on the desk” as a strategy to simplify the options on artifacts that would take part of the limited space of work within the home and that would have a direct visual and physical relationship with the user while its performing working activities.

Concept 1 GAME



What? (Rider)
A game that marks the beginning and end of the work routine. Enabling;

- Follow day activities, to mark, start, breaks and end. (End continuous)
- Reminder of healthy habits (stretching, drink water, etc)

Why? (Elephant)
Interacting with this game the psychological and physical component can be address while having a strong motivation.

- Sense of completion and accomplishment.
- At the end of the day the person will see display all the activities carried out.

How? (Path)

- Setting the goals and expectations of the day at the start
- Performing the challenges (Physically)
- Engage psychologically

Something on the wall:

Poster	Board game framed activate s with touch	LED screen	A string with cards hanging	Shelves with buttons or figures to move on the front	Like a clock but linear (Moving like a board game)
--------	---	------------	-----------------------------	--	---

Something on the desk:

Mouse pad	Stationary for pencils with buttons	Board game on top of the desk where you put computer, mouse, etc and can be folded at the end of the day	Panel with acoustic absorption, that can be organized like a tangram
-----------	-------------------------------------	---	---

Figure 19. Game approach concept

Concept 2 TOTEM

"A representation of such an object serving as the distinctive mark of the clan or group. Anything serving as a distinctive, often venerated, emblem or symbol." Source: www.dictionary.com



Symbolize the day activities, time and personal goals. That reminds you to invest time in them.



That invites you to interact with them. Involving your senses with its meaning.

By touching:

- Like a stress ball
- Pushing buttons
- Clicking



By looking:

- Turning ON/OFF
- Changing positions
- Changing lights and colors



By listening:

- Voice commands
- Reminders
- Music



What? (Rider)
A Totem that represents or symbolizes;

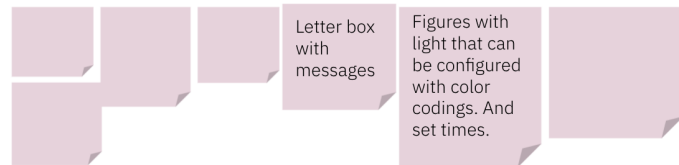
- The balance between work life
- Time
- End of work

Why? (Elephant)
While keeping it visible and charged with a meaning it can help you to be aware.

- To have something to look to, touch that has symbolic meaning
- That interact with senses

How? (Path)
By incorporating physical action of touching that can activate a sound or a light the meaning of the artifact can have a bigger impact.

Something on the wall:



Something on the desk:

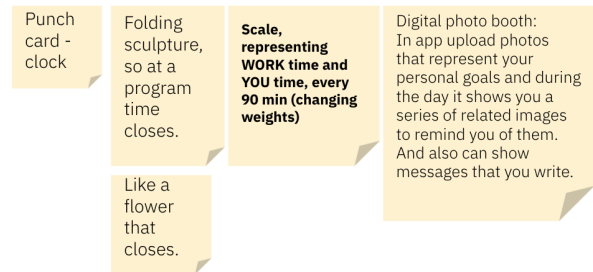
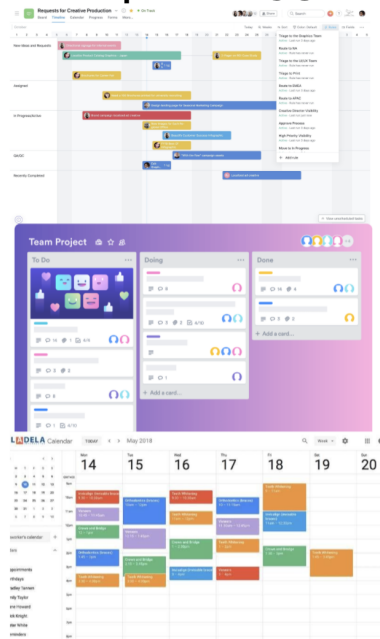


Figure 20. Totem concept

Concept 3 VISUAL MARKS



Making tangible and interactive the information that we have on apps, digital calendars, etc.

Visualizing the data that we feed.

- Task
- Goals
- Activities
- Schedule
- Start&End
- Breaks
- Reminders



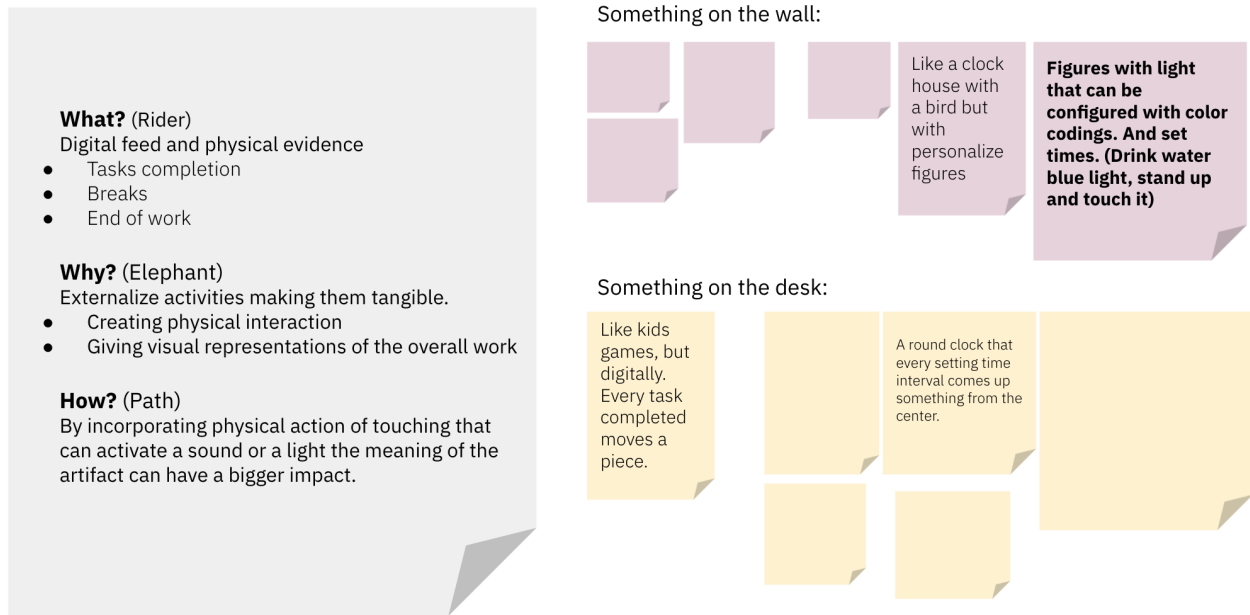


Figure 21. Visual marks concept

These three initial main concepts were analysed in depth, the possibilities of the ideas and how feasible and effective these proposals could be, to then develop three proposals in more detail, which will be explained in the following part of ideation.

4.4.2. Ideation

These ideas were developed as design provocations, synthesizing all the previous stages of research, in order to receive feedback and evaluate from there.

Concept 1 - Desk Scale

As a metaphor for the balance scale (see Figure 23), it represents work / life balance. It makes the imbalance of work at home visible and physical, interfering and directly affecting work conditions when the balance goals set by the user are not achieved.

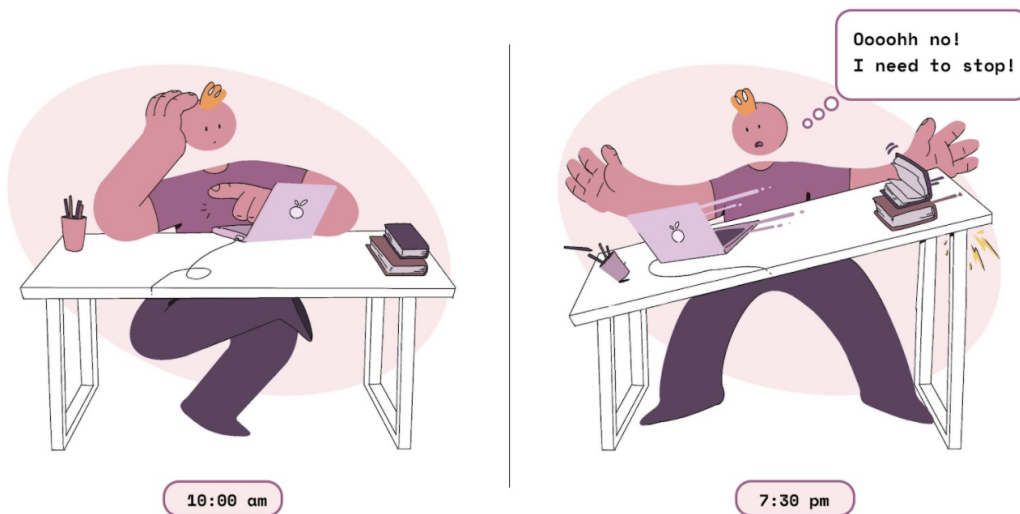


Figure 22. Desk scale concept illustration

How does it work? This desk / standing desk has the standard hydraulic system to adjust the height with an added mode that inclines the surface, which can be turned on and off when convenient.

The mechanism will be linked to applications such as calendar or task managers, where it recognises the number of hours of work without interruption and begins to progressively incline the desk surface creating unfavourable conditions to continue working, until the user compensates it with personal activities to achieve balance and consequently a straight working surface.

Concept 2 - Bird factor

As a reference of the cuckoo clock (see Figure 24), the bird represents the user's personal life, which is being neglected by their work life, and shows how it's condition worsens during the working day without attending to their personal and health needs. It makes visible the long-term consequences of having an unbalanced work life and how it will negatively affect physical and mental health.

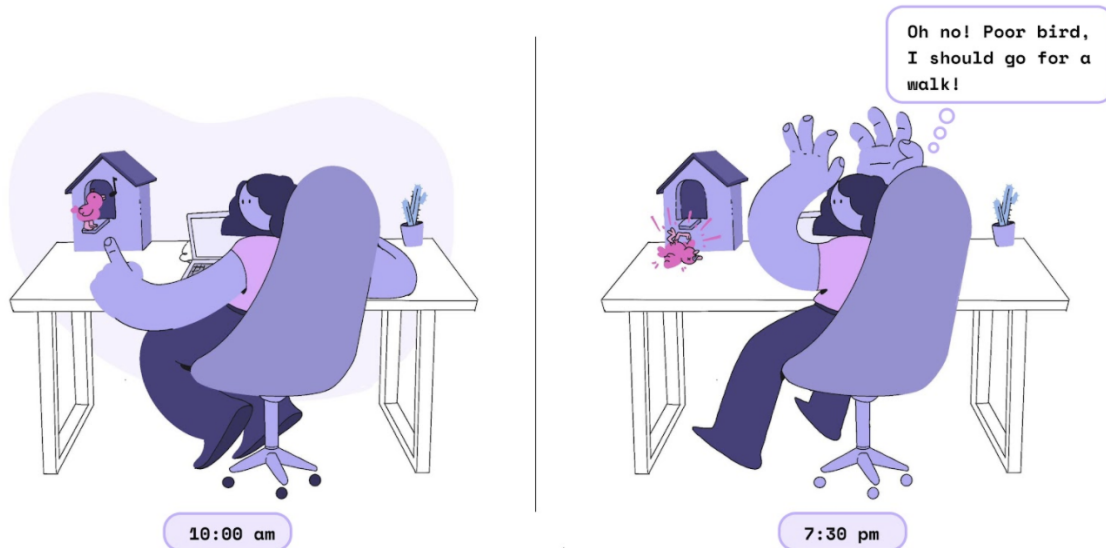


Figure 23. Bird factor concept illustration

How does it work? It will be linked to applications such as calendar or task managers, where it recognises the number of working hours without interruption, the bird's exit intervals can be configured according to the activities of the day, or scheduled times, but if the user does not perform his/her personal goals the bird will begin to appear each time in worse conditions throughout the day. From a fresh appearance and with a clear sound at the beginning of the day, to progressively deteriorate until reaching the maximum deterioration in its appearance with sound interference.

Concept 3 - Time Reels

With flexible working hours, setting limits and expectations is more important than time itself. The idea is that the user has a clear vision of the "stages of each day" expressed through a clock without numbers, that indicates the day progression with colours and a certain number of marks, that will trigger the projection of videos or

the so called “Reels” (, that are related to the marks or personal goals set by the user as motivational tool. (see Figure 25)



Figure 24. Time reels concept illustration

How does it work? It will be linked to an application such as calendar or task manager and will ask the user to indicate the number of hours that he/she plans to work and to set the marks or personal goals of the day; Indicating for example stretching at mid-morning and running at the end of the day, and when the clock gets to mid-morning a Reel of someone stretching will be projected on the wall and at the end of the day a Reel of a person running will be projected on the wall. This artifact will act as a reminder and motivation, projecting the user's goals and making them tangible and visual. This will help the user to achieve their personal goals, influencing and promoting positive and healthy habits into their work routine.

4.4.3. Evaluation with potential users

Sample

We received 42 responses to the concepts evaluation survey, nonetheless the demographic data of the respondents was not collected. The survey was shared on the same channels as the previous survey assuming we were able to reach more or less the same audience.

Instruments

The illustrations used in the survey were commissioned to the Designer Alvaro Torrens and were developed to express the meaningful characteristic of each concept, including the actions taking place and the expected user reaction, placed on the assumed context of the place of work at home.

The online survey was conducted using Google forms, and it was based on the short version of the User Experience questionnaire (UEQ). The questionnaire, together with some information concerning its application and an Excel-Tool for data analysis is open and available on www.ueq-online.org in the English version. This is a widely used questionnaire to measure the subjective impression of users towards the user experience of products.

Attractiveness is a pure valence dimension (emotional reaction on a pure acceptance/rejection dimension). Perspicuity, Efficiency, and Dependability are pragmatic quality aspects, i.e., they describe interaction qualities that relate to the tasks or goals the user aims to reach when using the product. Stimulation and Novelty are hedonic quality aspects, i.e. they do not relate to tasks and goals, but describe aspects related to pleasure or fun while using the product (Schrepp, Hinderks & Thomaschewski, 2017).

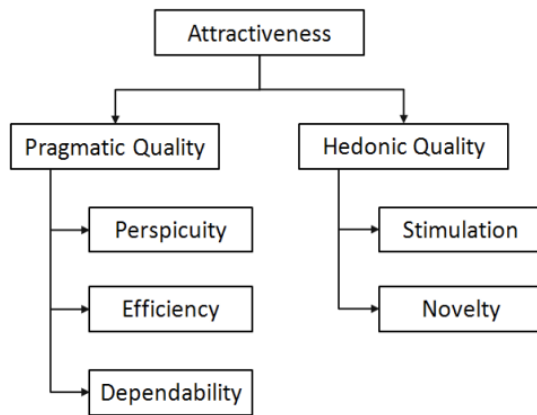


Figure 25. Scale structure of the The user experience questionnaire (UEQ)

Terms definition:

- Attractiveness: The product looks attractive, enjoyable, friendly and pleasant.
- Efficiency: I can perform my tasks with the product fast, efficient and in a pragmatic way. The user interface looks organized.
- Perspicuity: The product is easy to understand, clear, simple, and easy to learn.
- Dependability: The interaction with the product is predictable, secure and meets my expectations. The product supports me in performing my tasks.
- Stimulation: Using the product is interesting, exciting and motivating.
- Novelty: The product is innovative, inventive and creatively designed.

Another tool that the UEQ provides, is the possibility to compare the product with an online database which contains in the moment the data of 452 product evaluations with the UEQ (with a total of 20190 participants in all evaluations) and its update regularly. For an evaluated product, the UEQ shows a pattern of 6 measured user experience qualities. From this pattern it is possible to make at least some assumptions where to look for improvements.

The benchmark classifies a product into 5 categories (per scale):

- Excellent: In the range of the 10% best results.
- Good: 10% of the results in the benchmark data set are better and 75% of the results are worse.
- Above average: 25% of the results in the benchmark are better than the result for the evaluated product, 50% of the results are worse.
- Below average: 50% of the results in the benchmark are better than the result for the evaluated product, 25% of the results are worse.
- Bad: In the range of the 25% worst results.

Procedure

The objective of the UEQ is to allow a quick assessment done by end users assessing their impression of user experience. “It should allow the users to express feelings, impressions, and attitudes that arise when experiencing the product under investigation in a very simple and immediate way.” (Schrepp, Martin & Hinderks, 2017). The UEQ consists of 26 items that are grouped into 6 scales. Each item has a pair of terms with opposite meanings within the categories of Pragmatic quality and hedonic quality that comprises the attractiveness appreciation, for example: Not understandable - Understandable, Efficient - Inefficient. Participants were invited to read the description of the concept with the explanation of how it will work along with an illustrative image of the concept, then the respondents were asked to rate each item on a 7-point Likert scale. The answers are scaled from -3 (fully agree with negative term) to +3 (fully agree with positive term). And at the end of all three sections there was a space for expressing comments or opinions about the concepts. After collecting responses for a period of 4 four weeks, the responses were introduced in the proposed UEQ excel file and further analyzed.

Results and discussion

Concept 1 - Desk scale

Respondents expressed their concern about how stressful the situation of a moving desk could be for them including the risk of damaging equipment “The inclination may put in danger the company's equipment that you're supposed to protect, for example, tumble a glass”. Although is also seen as innovative and not conventional “A radical idea, but very proactive. In any case, I suggest you have a mechanism that allows you to disable this function if necessary.”, but at the same time some comment how this could be very effective because it was hard to not pay attention referring to “A radical idea, but very proactive”.

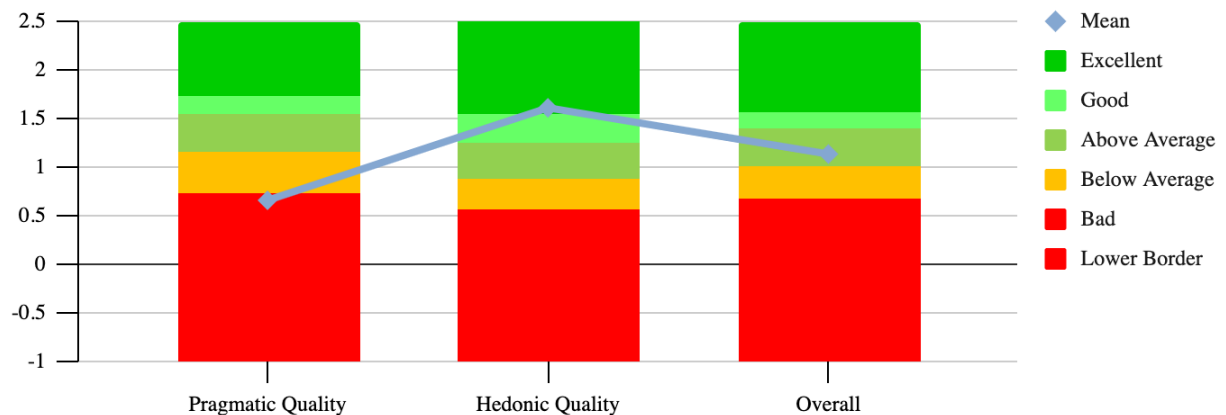


Figure 26. Desk Scale benchmark evaluation graph

On Figure 27, the benchmark graph from the Excel-Tool shows how the UX quality of the evaluated product is. The Overall evaluation is Above average (25% of the results in the benchmark are better than the result for the evaluated product, 50% of the results are worse) The hedonic quality Excellent value of evaluation compensates for the bad value on the Pragmatic quality evaluation. The lowest values were on the

pragmatic qualities of Dependability = Obstructive / Supportive (Mean = 0.0) and Efficiency = Inefficient / Efficient (Mean = 0.5). Considering that the main objective of a table is to procure a horizontal (Levelled and secure) surface to support stuff and equipment, respondents are inclined to consider it as unsupportive for their tasks and unsafe. The highest values (and highest of the whole evaluation) on Hedonic qualities were on Novelty = Conventional / Inventive (Mean = 2.3) and Usual / leading edge (Mean = 2.2) also Stimulation = Boring / Exciting (Mean = 1.0).

Concept 2 - Bird factor

This concept had positive feedback “This one is more interesting because it works in an informative way. I mean, sometimes you are working so hard, and you don't realize it, so the bird can be an educational tool.” and “AMAZING idea, I think the most efficient way to influence a person is something that taps into psychology + visual. It has both features and should really make an impact on a person’s thinking process!” although there were also comments on how strong the impact would be if the user has lack of empathy or attention towards the product “The effect may wear off with habit/lack of empathy” and personal opinions such as “On me it wouldn't work. I believe it can be a matter of empathy!”

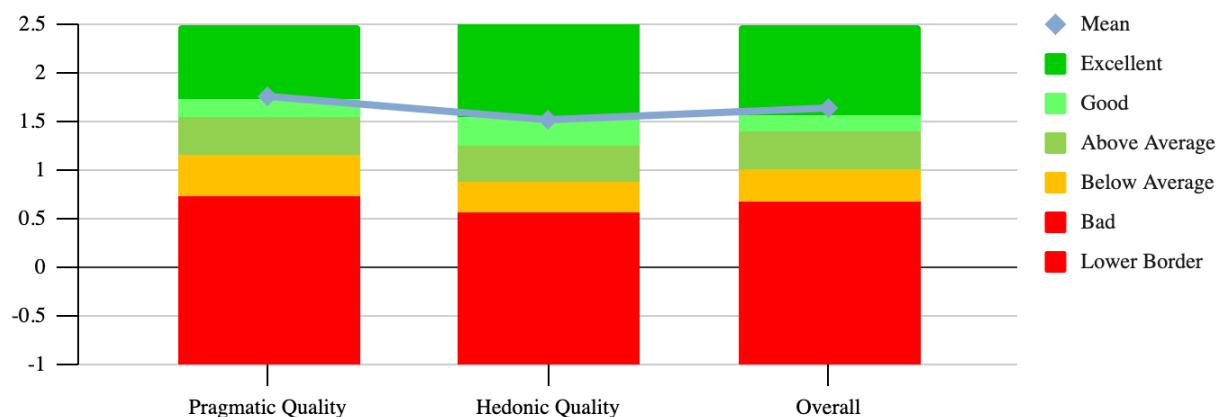


Figure 27. Bird factor benchmark evaluation graph

As shown in Figure 28 the overall evaluation of the product contrasted in the benchmark is excellent (In the range of the 10% best results). Contrary to the concept of Desk scale the highest values in Pragmatic qualities such as Perspicuity = Confusing / Clear (Mean = 2.2) and Efficiency = Inefficient / Efficient (Mean = 1.6). Having the lowest value on Hedonic qualities such as Stimulation = Boring / Exciting (Mean = 1.2)

Concept 3 - Time Reels

These concepts brought up many questions about its functionality and how it would work. “The visual part is well thought out, it might motivate people but again it is like an option to people. Most likely they will snooze or ignore it.” and also that it wasn't motivating enough, or that people would get distracted with it. On the other hand it has a lot of potential for showing different images and videos, and changes constantly so it keeps the interest. But it would have only visual effects “More of a visual adaptation to smart watches I’d say”.

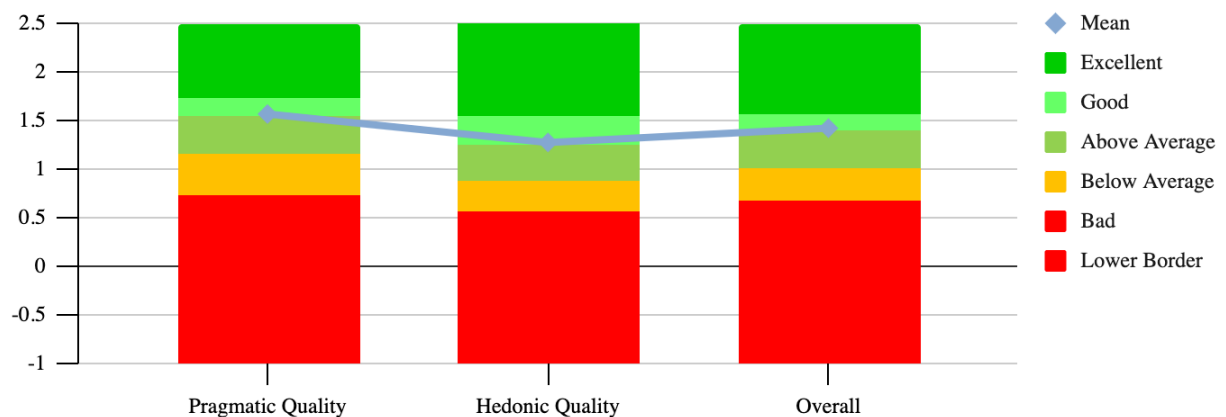


Figure 28. Time reels benchmark evaluation graph

As shown in Figure 29 the overall evaluation is above average (In the range of the 10% best results) same as Desk scale, with the difference of having slightly better

evaluation on the pragmatic quality than on the hedonic quality. The highest value is related to Pragmatic quality of Perspicuity = confusing / clear (Mean = 2.0) and the lowest in Hedonic quality refers to Stimulation = Exciting / boring (Mean = 1.1).

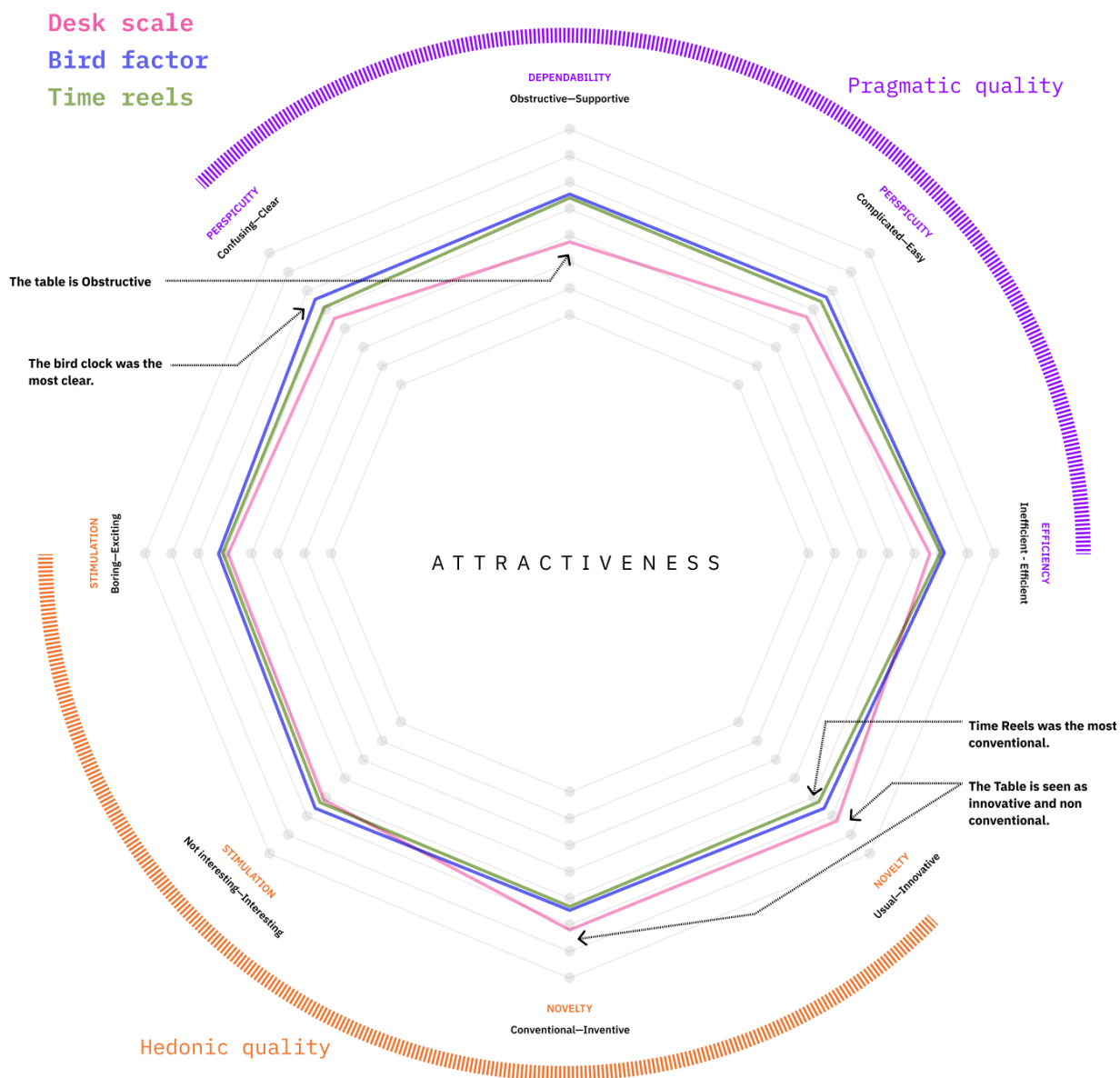


Figure 29. Mean results of the User Experience Questionnaire (UEQ) represented on a radar chart.

As a summary (see Figure 30), the bird factor has the highest values in the sample, being the highest in 6 parameters (4 of Pragmatic Quality) and not having the lowest value in any variable. The Desk scale has the lowest values in 6 of the 8 parameters, and the most important attribute to highlight is that it was considered a disruptive idea.

At the end of the evaluation carried out, the respondents were asked to choose which of the concepts they preferred, and the results had very little margin of difference; it was a pattern that was maintained throughout the whole collection of the 42 responses. The bird scale and desk scale obtained the same percentage of 34,1 % de votes (N=14) and the rest were for the Time reels with 31.7 % (N=13) and 50% (N=21) responded 4 (In a scale from 1 to 5) that they be very much willing to use it if it existed.

4.4.4. Frame solutions

According to the previous evaluation and considering the UEQ parameters analysis, the Bird factor was the concept best rated by the respondents and also compared to the benchmark database. This is the chosen concept to develop in further stages.

The Bird factor was also the concept with the most marked components previously mentioned, Physical (Visually) and Psychological (Emotionally), directly focusing on the sentiment of guilt and responsibility that appears to be present in most cases as the reason for overwork and disabling Psychological Detachment, although in this case referring to the guilt and responsibility as consequences of their own personal life neglect.

In order to iterate versions of the bird factor, it is important to highlight the most significant aspects to consider in future proposals, according to the analysis of the

open section of the UEQ where respondents left comments and opinions regarding each of the concepts;

The negative feedback was related to the sound and size of the Bird clock, some participants said that if it was too loud it would annoy them, and that they did not want something that could take up space in their desk because it is already limited. What was also mentioned is that the "effect" of empathy towards the bird can wear off with habit, and for people that overworked regularly it would be easy to just ignore it. Some people compare the idea to productivity apps but in this case physical and someone said "It is just another notification like we have on our smartphones. We do not need a product for this."

The positive feedback outnumbers the negative, for example someone commented "Amazing idea, I think the most efficient way to influence a person is something that taps into psychology + visual. It has both features and should really make an impact on a person's thinking process!" And others such as "Cool idea to readapt a well-known device to the XXI century needs" but mostly comments about how easy and simple it could be to include it into routines for having reminders. According to the design it could also add value as an aesthetic element in the room and the most important aspect is that it is an informative tool.

The features that the bird clock iterations will maintain:

- Link with task/time managers
- Reminders (Alarm, task, time)
- Expressions (Bird expressions, sound, movements)
- Empathy / Self Awareness

4.5. Realization

4.5.1. Realize offerings

The proposed product evolved based on the features previously mentioned into a product that will focus on providing an End ritual (Transition) to the user, that would act as personal activities reminders throughout the day, that according the recommendations provided by the experts that were reviewed in this thesis are highly effective on achieving psychological detachment at the end of the working day, such as taking several breaks during the day and providing a sense of closure, applying the different boundary management strategies (Communicative, temporal, technological) While monitoring water intake, meals and stretching as general recommendations for maintaining healthy habits, and any other “Personal” reminder dedicated to physical and psychological health of users while working.

The main future of the product will be the End signal of the End ritual, that would be configured by the user every week, according to their needs in order to develop habits of transitioning between roles and explore the most effective strategies. Customization will be the key, as every person would find effective different strategies according to their preferences. Ultimately this will be an informative tool of self-knowledge and self-care, it would provide reports of habits according to its use and act as a personal activities manager.

Being part digital to facilitate the functions that in some ways are in the same work environment as the user (The computer) pop up messages will be more effective in terms of attention, and physical part to materialize or externalize these alerts and reminders, keeping the character of the bird because it provides a friendly and much more relatable character capable of evoking empathy.

How does it work?

The user will fill at the beginning of the day, week or month according to the desired settings the following reminders (See Figure 31)

- Reminders during the workday -

How often would you like to take breaks?

Every 40 min of 10 min

Every 90 min of 20 min

How much water would you like to drink?

Every 2 hours

Would you like to set your meal times?

Breakfast:

Lunch: 13:30 hs

Snacks: Every 4 hours

Coffee: 16:00 hs

Take short breaks and concentrate on breathing.

Every 2 hours for 10 min

Do some stretching

Every 1 hour for 5 min

Take medicine*

Every 8 hours

Check the dog*

Every 3 hours

What time are you planning to finish working?

At 18:30 hs I would like to finish working.

+ Add reminder

What will be the END signal?

Play a song (Spotify)

Show me this message: [Insert text*]

Play a video from my playlist (YouTube)

Remind me of my scheduled (Google calendar)

Check tomorrow's agenda (Google calendar)

+ Add END signal

You are all set, Have a great workday!

Figure 30. Reminders database.

Throughout the working day (see Figure 32) and according to the reminders set by the user, a push notification will appear in the top right corner of the computer and the bird will pop up (2), according to the set reminders, for example; every 40 min to remind the break of 10 min.

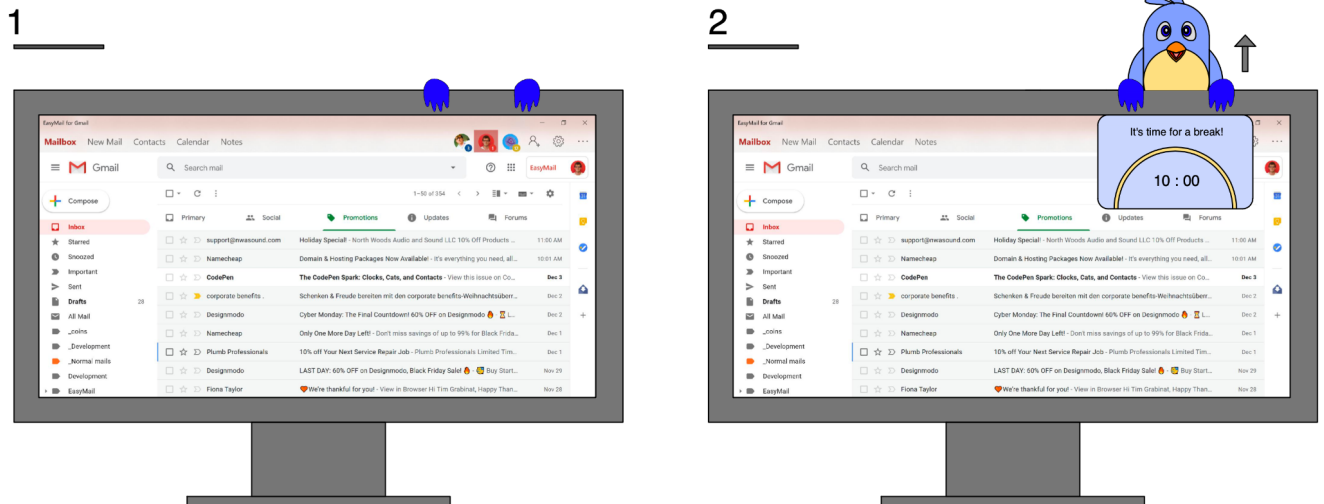
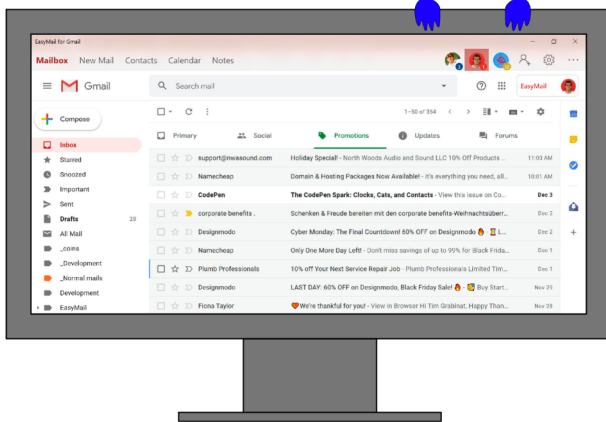


Figure 31. Bird appearance

In case that the user is busy and unable to perform the activity that is being reminded, for example in the middle of a meeting every push notification will have two options to select, one will be “Yes, let's do it!” and the chronometer will start to count the set time or “Not now!” and the message and bird will disappear. Every 3 consecutive “Not now!” the bird will start appearing affected and deteriorated (see Figure 33), until the next 3 following reminders are performed correctly and the bird will appear “Normal” again.

1



2

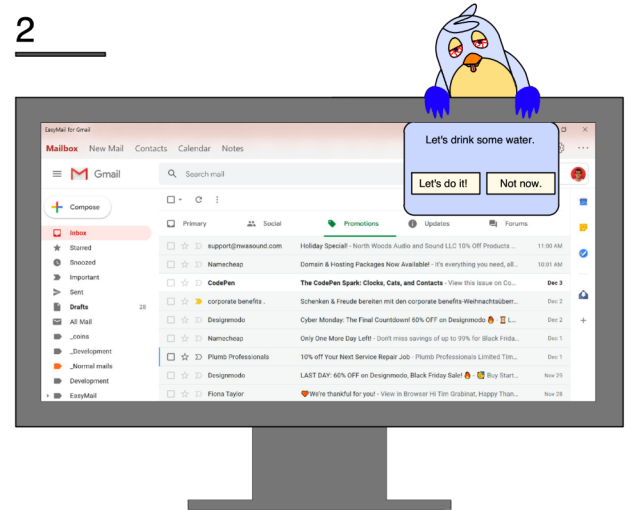
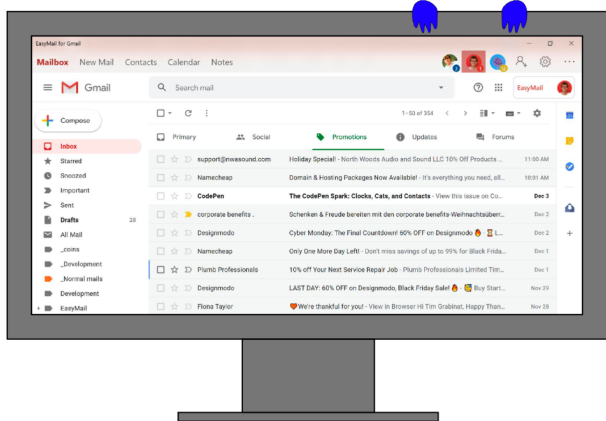


Figure 32. Bird appearance deteriorated state

And at the end of the day, the set time for example at 18:30 hs it will appear the bird going up and down (see Figure 34), and if the user is ready to stop working she/he will click on the yellow button and then will pop up the option(s) that were selected or added by each user in order to create their own END ritual. The user will have to push down the bird manually when it is done working as finalization to the end ritual.

1



2

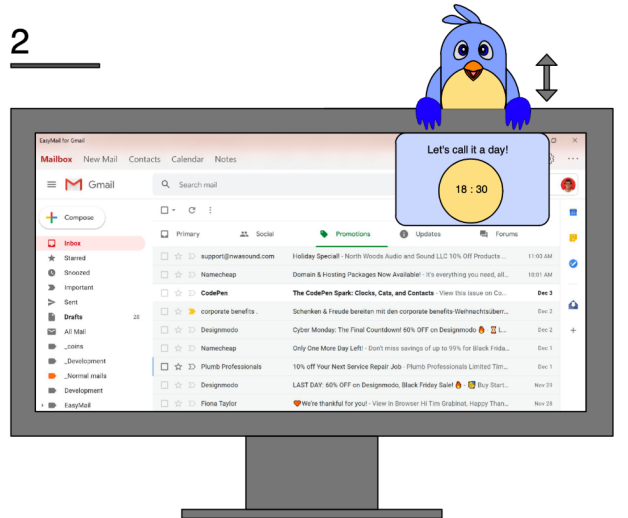


Figure 33. Bird appearance END reminder

The three positions of the artifact (See Figure 35) are; (1) When the bird appears along with the window messages showing the set reminder, and when the user

selects the “Let’s do it!” option the timer starts displaying the set time program for that activity, when the time is up the bird disappears going back down along with the window message.

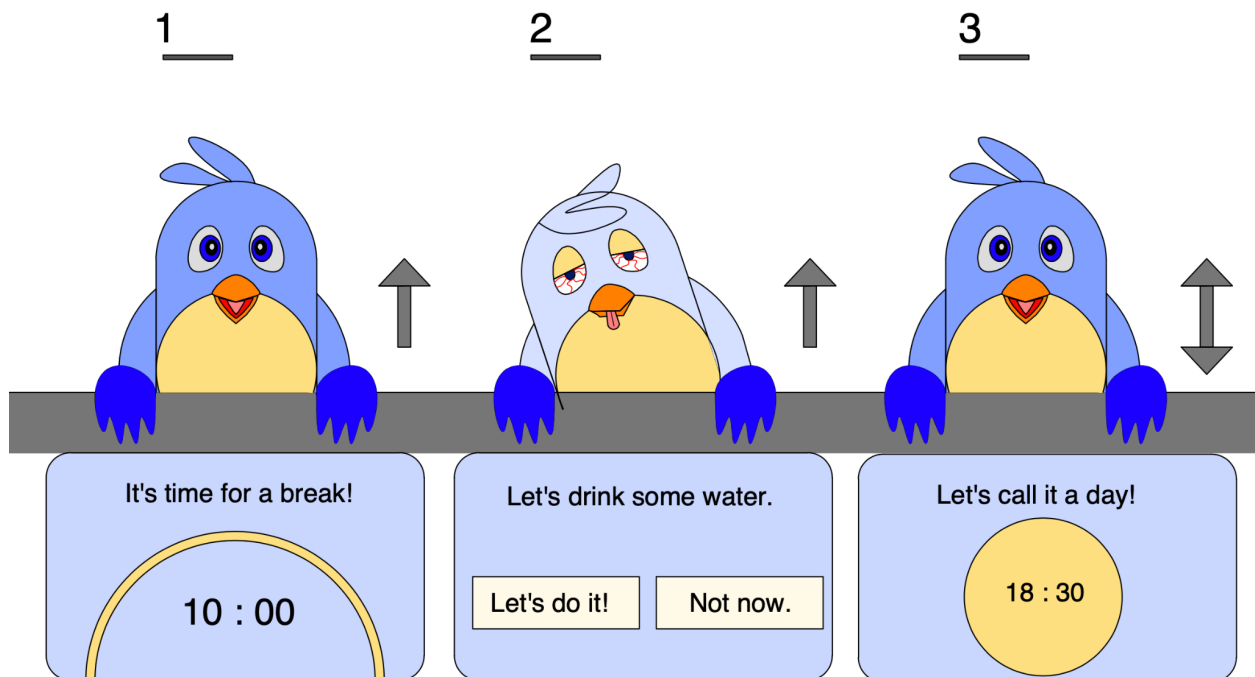


Figure 34. Bird positions

The deteriorated bird (2) shown in Figure 35 that appears after three of the previous reminders were ignored and “Not now” was selected consecutively, then the deteriorated bird will keep appearing along with message windows with the following reminders, until the user completes three consecutive reminders.

The "End" bird will appear according to the sequence that the user has been carrying, i.e., if the time that the user previously set as the end of the working day arrives and the bird is in good condition, it will appear in good condition (3) if the bird is deteriorated because all reminders prior to the end were ignored, including the end

time that can also be ignored, by selecting "Not now.". The difference with the end of day position is that the bird, whatever its condition is, will go up and down continuously, until the user manually brings it down and puts it away, this as a physical and intentional action conducted by the user to mark the end.

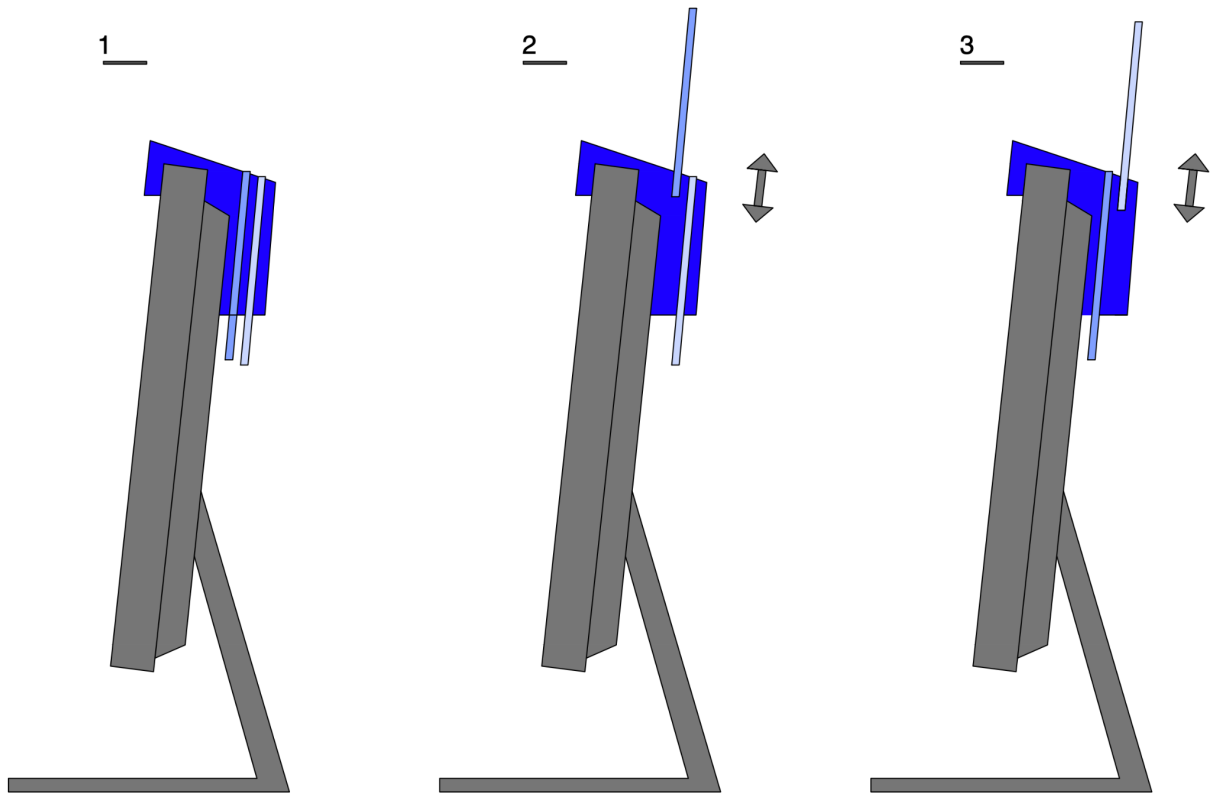


Figure 35. Bird factor Mechanism

The bird will have an integrated microcontroller that receives commands via Bluetooth to activate the bird (See Figure 36). For the notifications on the screen, a widget would be developed to trigger the notifications at the same time as the bird, according to the computer's clock and the previous set reminders.

Final remarks

5.1. Conclusions

The subject of this dissertation arose from a very particular situation, as was the confinement of the Pandemic of 2020, where many activities we conduct on a regular basis had to change in order to adapt to that “new” reality, which went from being an emergency and temporary situation to becoming our daily life. It was interesting to see how all the activities were developed in a single space, in this case the home, the home of each one, as this concept acquired an enormous importance and has undergone many transformations throughout this period in order to adapt to changing needs. Working from home implies many changes in the home dynamics, not only spatial but also interpersonal. Now that we find ourselves in a time where certain aspects of our lives seem to be returning to their “normal” or previous state, many people continue to work from home and this situation as has been discussed throughout this dissertation seems to continue to be the trend and the future of work, at least in a hybrid mode.

In this particular attempt to focus on one of the many issues that could be improved from working at home, it started by questioning ‘why work was invading people's lives in such a way?’ Other disciplines had the answers, as Psychology in this case, which helped us to understand the phenomenon and as designers develop tools that could contribute to improve people's difficult situations. For this reason, all the research conducted in order to determine causes and identify the main concepts related to the difficulty of "Not being able to unplug" is key in this work, which is summarized in the theoretical framework and informs all the following phases.

The user research phase was fundamental to know first hand and in more depth how people were really being affected by this work at home situation, what were their wishes, fears and hopes, who were being most affected and in what ways they were handling the situation so far. We had the opportunity to carry out co-creation sessions in the workshops we developed with the participants where once they had the background summary and the problem framed in a brief way, they focused on ideating solutions to help Ana, the person who was created with that objective, one that was struggling to disconnect from work at home.

This resulted in a series of ideas that emerged along with the theoretical framework that led to the proposal of the first three product concepts specifically intended to help people disconnect, to create boundaries between work and personal life. These concepts were developed using design methods, mentioned in the literature review, focused on creating desired interaction, thinking about future situations and how to establish beneficial habits for users, using resources such as metaphors and known elements that are transferred to another domain. These were subsequently evaluated by users, and according to their perception, one of the concepts was chosen for further development and iteration.

The latest concept of the Bird factor outlined in the realization chapter, embodies all the stages of this research and it is presented as the beginning of a conversation that needs to be continued about a product that could be centered in healthy practices while working from home, that highlights the importance of mental and physical health, that prioritize user's personal desires and goals, during and after work and above all a product that aim to maintain the work-life boundaries that now more than ever are showing their importance in preserving the home dynamics.

5.2. Limitations and future considerations

It is important to clarify that what was proposed as a product in the final part of the thesis is only the initial concept for the product and certainly, many elements will have to be resolved in detail, as from the technical aspect, as well as the development of the digital platform components, the interface and the user experience, will have to be considered first. The future stage of this work will be to test this concept with users, in this case with prototypes, not only to evaluate the user appreciation of the product as was done previously with the three initial concepts stage, but to obtain concrete results on its effectiveness, whether it contributes to achieving psychological detachment and in what level.

The biggest challenge in relation to the subject of this thesis is that it addresses behaviors and habits, which can only be considered through sustained study and observation over a certain period of time. Only with the continuous repetition of these "rituals" could we observe their real effects in daily practices, specifically if they could influence on improving the work routines at home.

References

- Ashforth, B., Kreiner, G., & Fugate, M. (2000). All in a Day's Work: Boundaries and Micro Role Transitions. *The Academy of Management Review*, 25(3), 472-491.
- Ashforth, B. (2001). Role transitions in organizational life: an identity-based perspective. Mahwah, N.J. ; London : Lawrence Erlbaum Associates.
- Baumann, A., Muijen, M., Gaebel, W., & World Health Organization. (2010). Mental health and well-being at the workplace: Protection and inclusion in challenging times. Copenhagen: WHO Regional Office for Europe.
- Buffer (2021). *State of remote work report*. Retrieved on March 2021, from buffer.com/2021-state-of-remote-work
- Crilly, N., Maier, A., & Clarkson, P. J. (2008). *Representing artefacts as media: Modelling the relationship between designer intent and consumer experience*. *International Journal of Design*, 2(3), 15–27.
- Cirillo, F. (2018). *The Pomodoro Technique : The Life-Changing Time-Management System*. Virgin Books.
- Craig, A., & Cooper, R. E. (1992). *Symptoms of acute and chronic fatigue*. In A. P. Smith & D. M. Jones (Eds.), *Handbook of human performance* (Vol. 3, pp. 289–339). London: Academic Press.
- Crosbie, T., & Moore, J. (2004). *Work–Life Balance and Working from Home*. *Social Policy And Society*, 3(3), 223-233. doi: 10.1017/s1474746404001733
- Cropley, M. & Millward, L.J. (2009). *How do individuals ‘switch-off’ from work during leisure? A qualitative description of the unwinding process in high and low ruminators*. *Leisure Studies*, 28, 333-347.
- Clark, S. C. (2000). *Work/family border theory: A new theory of work/family balance*. *Human Relations*, 53, 747–770
- Deloitte. (2020) "*Mental Health and Employers*" Deloitte UK. Retrieved 24 february 2021.
- Etzion, D., Eden, D., & Lapidot, Y. (1998). *Relief from job stressors and burnout: Reserve service as a respite*. *Journal of Applied Psychology*, 83, 577–585. doi:10.1037/0021-9010.83.4.577
- Elsbach, K. (2004). Interpreting workplace identities: The role of office decor. *Journal of Organizational Behavior*. 25. 99 - 128. 10.1002/job.233.

- Gollwitzer, P. M. (1993). *Goal achievement: The role of intentions*. In W. Stroebe & M. Hewstone (Eds.), *European review of social psychology* (Vol. 4, pp. 141–185). New York, NY: Wiley.
- Haun, V., Binnewies, C., Sonnentag, S., & Mojza, E. (2011). *Learning How To Recover From Job Stress: Effects of a Recovery Training Program on Recovery, Recovery-Related Self-Efficacy, and Well-Being*. *Journal of occupational health psychology*. 16. 202–16. 10.1037/a0022169.
- Hey, J & Linsey, Julie & Agogino, Alice & Wood, Kristin. (2008). *Analogies and Metaphors in Creative Design*. *International Journal of Engineering Education*.
- Hekkert, P., & Dijk, M. (2011). *Vision in design: A guidebook for innovators*. Amsterdam: BIS Publishers.
- Heath, C., & Heath, D. (2011). *Switch: How to change things when change is hard*. London, England: Random House Business Books.
- Kumar, V. (2012). *101 design methods*. John Wiley & Sons.
- Kreiner, G. E., Hollensbe, E. C., & Sheep, M. L. (2009). *Balancing borders and bridges: Negotiating the work-home interface via boundary work tactics*. *Academy of Management Journal*, 52(4), 704–730
- Lockton, D., Harrison, D., & Stanton, N. (2009). *The Design with Intent Method: A design tool for influencing user behaviour*. *Applied ergonomics*. 41. 382–92. 10.1016/j.apergo.2009.09.001.
- Mark Cropley & Lynne J. Millward (2009) *How do individuals 'switch-off' from work during leisure? A qualitative description of the unwinding process in high and low ruminators*. *Leisure Studies*, 28:3, 333–347, DOI: 10.1080/02614360902951682
- Nazlı Cila, Paul Hekkert & Valentijn Visch (2014) *"Digging for Meaning": The Effect of a Designer's Expertise and Intention on Depth of Product Metaphors*, *Metaphor and Symbol*, 29:4, 257–277, DOI: 10.1080/10926488.2014.948795
- Nippert-Eng, C. (1996). *Calendars and Keys: The Classification of "Home" and "Work"*. *Sociological Forum*, 11(3), 563–582.
- Poldma, T. (2010). *Transforming Interior Spaces: Enriching Subjective Experiences Through Design Research*. *Journal of Research Practice*. 6.
- Poldma, T. (2008) *Dwelling Futures and Lived Experiences: Transforming Interior Spaces*, *Design Philosophy Papers*, 6:2, 141–155. doi: 10.2752/144871308X13968666267437
- Proshansky, H. M., Fabian, A. K., & Kaminoff, R. (1983). *Place-identity: Physical world socialization of the self*. *Journal of Environmental Psychology*, 3(1), 57–83. [https://doi.org/10.1016/S0272-4944\(83\)80021-8](https://doi.org/10.1016/S0272-4944(83)80021-8)

- Sonnentag, S., Bayer, U. (2005). *Switching off mentally: Predictors and consequences of psychological detachment from work during off-job time*. Journal of Occupational Health Psychology, 10(4), 393-414. doi:10.1037/1076-8998.10.4.393
- Sonnentag, S., & Kuttler, I., & Fritz, C. (2010). *Job stressors, emotional exhaustion, and need for recovery: A multi-source study on the benefits of psychological detachment*. Journal of Vocational Behavior. 76. 355-365. 10.1016/j.jvb.2009.06.005.
- Sonnentag, S. (2012). *Psychological Detachment From Work During Leisure Time: The Benefits of Mentally Disengaging From Work*. Current Directions in Psychological Science. 21. 114-118. 10.1177/0963721411434979.
- Sonnentag, S., & Fritz, C. (2014). *Recovery from job stress: The stressor-detachment model as an integrative framework*. Journal of Organizational Behavior. 36. 10.1002/job.1924.
- Smit, B. (2015). *Successfully leaving work at work: The self-regulatory underpinnings of psychological detachment*. Academy of Management Proceedings, 2015(1), 17276. <https://doi.org/10.5465/ambpp.2015.17276abstract>
- UEQ Online: www.ueq-online.org (last visited: 26.07.2021)
- Van Boeijen, A., Daalhuizen, J., & Zijlstra, J. (2020). *Delft Design Guide: Perspectives, models, approaches, methods*. (2nd ed.) BIS Publishers.
- Vitra. (2021). *"Home dynamics"*. Issue 06. Vitra International AG. Retrieved on 12 march, 2021.

Appendix

I: Timeline of activities

TIMELINE OF ACTIVITIES													
Stage	Task	October/2020	November/2020	December/2020	January/2021	February/2021	March/2021	April/2021	May/2021	June/2021	July/2021	August/2021	September/2021
Briefing	Define scope												
	Define Problems												
	Define Objectives												
	Define Methodology												
	Hipohthesis												
	People involved and resources												
Background Research	Work-life balance												
	Home space as a work environment												
	Psychological Detachment												
	Boundaries and Micro role transitions												
	Role Exit and rites of separation												
	Managing physical artifacts												
User Research	Initial questionnaire												
	Personas												
	Scenarios												
Ideation	Product requirements												
	Ideation sessions												
	Solutions selection												
Prototyping and testing	Prototype development												
	Evaluation with users												
	Results and conclusions												
Iteration (Time constraint)	Iterate acordng results												
	Improve prototype												
	Testing												
	Results and conclusion												
Dissertation writing and presentation	Chapters writtng												
	Correcctions												
	Visual contents												

Appendix

II: Questionnaire

WORK FROM HOME EXPERIENCE SURVEY

HELLO! I am Maria Cartay and I thank you for agreeing to fill out this survey, it's carried out as part of a research for my master's thesis in the program of Product and Space Design at lade. I'm looking for insights around your experience of working from home, please try to be honest and open with your answers, your information will be anonymous and your details will not be shared. Completing it will take approximately 10 min. Here is my contact email in case you have any comments or questions: mmcartay@gmail.com

* If you do NOT work from home, please do not fill this questionnaire.

1. Do you agree to participate in this research study, have you read and understood the purpose and nature of this study and are you willing to participate voluntarily?

Mark only one oval.

- ☐ Yes, I agree.
- ☐ No, I do not agree. (If you do not agree, please do not fill this questionnaire)

2. What is your age?

Mark only one oval.

- ☐ 25 - 30
- ☐ 31 - 36
- ☐ 37 - 42
- ☐ 42 - Older

3. What is your gender?

Mark only one oval.

- ☐ Female
- ☐ Male
- ☐ Other: _____

4. Where are you currently living? (Country, City)

5. What is your living situation?

Mark only one oval.

☐ I live alone

☐ I live with my partner

☐ I live with my partner and children

☐ I live with roommates

☐ Other: _____

6. In which space of your house is located your workspace?

Mark only one oval.

☐ I don't have a fixed space, I move around the house

☐ In the dining room/living room

☐ In the bedroom where I sleep

☐ In a studio/office/second room

☐ Other: _____

7. What type/size of company do you work for?

Mark only one oval.

☐ Self-employed

☐ Small company (Fewer than 50 employees)

☐ Medium company (Less than 250 employees)

☐ Large company (More than 250 employees)

☐ Other: _____

8. In which sector do you currently work?

Mark only one oval.

- ☐ Computer and IT
- ☐ Medical and Health
- ☐ Creative Arts and Design
- ☐ Marketing, Advertsing and PR
- ☐ Education and Training
- ☐ Travel and Hospitality
- ☐ Accountancy, Banking and Finance
- ☐ Other: _____

9. What is your seniority level?

Mark only one oval.

- ☐ Entry level (Junior, intern, trainee)
- ☐ Mid-level (Professional, lead, supervisor)
- ☐ Senior level (Executive, director, manager, chief)
- ☐ Other: _____

10. How much time would you say you dedicate weekly to these work activities?

Mark only one oval per row.

	Very little	2	3	4	Very much
Video and Phone calls	☐	☐	☐	☐	☐
Reading materials and emails	☐	☐	☐	☐	☐
Writing content and emails	☐	☐	☐	☐	☐
Drawing	☐	☐	☐	☐	☐
Listening contents and talks	☐	☐	☐	☐	☐
Creating content	☐	☐	☐	☐	☐

11. What would you consider your workload to be on a weekly basis?

Mark only one oval.

	1	2	3	4	5	
Extremely low	☐	☐	☐	☐	☐	Extremely high

12. What would you consider your stress level to be on a weekly basis?

Mark only one oval.

	1	2	3	4	5	
Extremely low	☐	☐	☐	☐	☐	Extremely high

13. How many hours per week do you work from home?

Mark only one oval.

- ☐ Full time (Around 40 hours a week)
- ☐ Part time (Usually less than 30 hours a week)
- ☐ Other: _____

14. How long have you been working from home?

Mark only one oval.

- ☐ Only since the Pandemic started, in 2020
- ☐ Before the pandemic, for less than 2 years now
- ☐ For more than 2 years now
- ☐ Other: _____

15. How would you say you manage your work schedule on a daily basis?

Mark only one oval.

- ☐ I'm very strict, and I only work within the stipulated hours of my job
- ☐ I can be flexible, If a start later I stay a little after time
- ☐ I usually work many hours beyond my schedule
- ☐ I don't have a fixed schedule
- ☐ Other: _____

16. What is your opinion in relation to the following statements?

Mark only one oval per row.

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
"It feels like I'm working longer hours now that I work from home instead of the office"	☐	☐	☐	☐	☐
"Now that I work from home I feel like I have more time for my personal activities"	☐	☐	☐	☐	☐
"My work-life balance has improved since I work from home"	☐	☐	☐	☐	☐
"When you work from home, it is difficult to know where the work ends"	☐	☐	☐	☐	☐
"I miss commuting, I used to disconnect from work in the way home"	☐	☐	☐	☐	☐

17. How do you usually start your work routine at home? (Example: Opening your computer and checking your emails, etc.)

18. How do you usually end your work day at home? (Example: Clearing out your schedule and cleaning your mug, etc.)

19. When you are working at home, normally what would be the most important change you make to mark the transition of when you finish work?

Mark only one oval.

- ☐ Change clothing
- ☐ Change your mood
- ☐ Leave or change space
- ☐ Change of settings (Like lights or music)
- ☐ Other: _____

20. Would you consider that you have difficulties keeping your mind off work in your free time?

Mark only one oval.

	1	2	3	4	5
Strongly disagree	☐	☐	☐	☐	☐ Strongly agree

21. Do you have a trick, routine or activity that helps you take your mind off work after you finish working? If so, please tell us how you do it.

22. Is it important for you to have work-life boundaries?

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	☐	☐	☐	☐	☐	Strongly agree

23. How do you manage to have work-life boundaries at home?

Mark only one oval.

- ☐ Avoid being emotionally involved and developing personal relationships at work
- ☐ Maintaining strict work hours
- ☐ Having a separate workplace from the rest of the spaces in your house
- ☐ Ignoring work related emails and phone-calls outside your work hours
- ☐ Other: _____

24. Which of these aspects of your experience of working from home would you like to improve or change the most?

Mark only one oval.

- ☐ Time management and routines
- ☐ Conditions of your physical workspace
- ☐ Personal relationships with co-workers and family
- ☐ Health and wellbeing state
- ☐ Furniture and work equipment
- ☐ Other: _____

25. An open space in case you have something else to say or want to express in relation to the survey or your experience.

26. Thank you for your time and collaboration by completing this survey. The next phase of the study involves short surveys over a week. Would you be willing to participate? If so, please leave your email below for contact. Thanks again!

This content is neither created nor endorsed by Google.

Google Forms

Appendix

III: Workshops ideation boards

HOW can we help Ana to achieve her goal of disconnecting from work?

Ideate: 15 min & 5 min to present



Time management, healthy routines & well-being

Ana would like to have an airfryer, so that she can cook healthy and delicious meals. She will invest time on planning the dinner menu for the week and will be able to disconnect from work

Ana would like to have a new pair of running shoes
So that she can feel motivated to go for a walk

Ana would like to have a strong morning routine

So that she can walk for 1 hour daily before starting her shift

Ana would like to have a healthy routine of communication with her partner. A physical calendar / post it set.

So that she can set focus times, or to have the ability to manage important calls without negative issues.

Ana would like to have a stronger self motivation. Set an organizer kind of app.

So that she can disconnect without inconvenience.

Ana would like to have a strict schedule on walking, stretching and doing exercise
So that she feels better and be healthier

Ana would like to have a game that she can start in the morning, she can play it during the day, and the game ends at the end of the day, so with that, she can feel it is complete mission.



Managing physical space, furniture & decorations.

Ana would like to have her own room
So that she can forget about work when she leaves her "little office"

Ana would like to have an order / clean-space kind of responsibility. Maybe a big garbage can or a tray.
So that she can enjoy a free / clean space.

Ana would like to have a bigger window, so that she could see what is happening outside her apartment

Ana would like to have a visual cue, like an art piece or design artefact, that goes from A to B, where B is a time frame she can set, so that she can keep track of how the day duration is going, and always have that in front as a reminder.

Ana would like to have a defined space for working comfortable and not disrupting with noise any meeting (for her or her partner)
So that she can work better

Ana would like to have a bigger desk so that she can keep all the work related stuffs in one place

Ana would like to have a medicine ball.
So that she can exercise her back and feel better.

Ana would like to have a T2
So that she can have her own office space



Communication & technology

Ana would like to have a good personal computer
So that she can stop using her work device for personal stuffs

Ana would like to have a professional camera, so that she can invest time on a new hobby

Ana would like to have a proper set of headphones / pro headset.
So that she can avoid potential headaches.

Ana would like to have technique and app that allows proper disconnections (like pomodoro) but focused on also well being, so she can feel more productive without affecting her mind

Ana would like to have a reminder when she gets into the final task, that ask about how the day went, and keep track of the emotions and feelings, that celebrates another day of good work, and give advice when it wasn't.
So that she can know the time when she can start personal routines.

Ex.:
Ana would like to have a device that reminds her when she has to finish work. So that she can be aware of the her time.

Ana would like to have a...

So that she can...

Ana would like to have a...

So that she can...

Ana would like to have a...

So that she can...

Group 1 - Low

miro

HOW can we help Ana to achieve her goal of disconnecting from work?

Ideate: 15 min & 5 min to present



Time management, healthy routines & well-being



Managing physical space, furniture & decorations.



Communication & technology

Ex.:
Ana would like to have a device that reminds her when she has to finish work. So that she can be aware of the her time.

Ana would like to have an organised schedule (fixed ours, google agenda or physic agenda)
So that she can establish the finish of day work

Ana would like to have a commitment with a teacher or personal trainer
So that she can have an specific time to finish the job.

Ana would like to have two mobiles,
So that she can separate her work and her personal life.

Ana would like to set a specific time each day to organize the agenda and organize tasks by color.
So that she can keep her priorities as clear as possible

Ana would like to have a week board with all her activities (day by day) including work and personal routine.
So that she can free herself of the guilt of work being all the time working.

Ana would like to have a device that helps her organising tasks and goals (like asana, for example).
So that she can not be working all the time.

Ana would like to have a good chair and table, also with a proper kind of lighting
So that she can have a healthy job routine

Ana would like to have a board on her wall
So that she can have a visual identification of her working space

Ana would like to have a silent space or private workspace, as separated spaces or isolated from others sound
So that she can be more focused and productive, without distractions.

Ana would like to have a multifunctional space.
So that she can separate the work space in the living room.

Ana would like to have a big drawer to hide away all the work stuff after workhour.
So that she can forget about it.

Ana would like to have a smart watch
So that she can have a notification on when to "move her body" xD

Ana would like to have music system that tells her is time to stop working.
So that she can start disconnecting

Ana would like to have a...
So that she can...

Ana would like to have a...
So that she can...

Ana would like to have a...
So that she can...

Group 2 - Medium

miro

HOW can we help Ana to achieve her goal of disconnecting from work?

Ideate: 15 min & 5 min to present



Time management, healthy routines & well-being



Managing physical space, furniture & decorations.



Communication & technology

Ana wants a exercise activity after work

So that she can de-stress

Ana wants to have an agenda, so she could be more organized with her things-to-do.

Ana wants to have a meal schedule so she can cut off work during the day

Ana wants a diary or agenda where she can writes her routines and organise her time, also to help her to achieve personal goals

Ana wants a device that remember her to have healthier habits

So that she can improve her wellbeing

Ana wants a list of things that she accomplishes in that day

So that she can see that she has done a lots of things and feel that she has done stuff instead of feeling she is missing something

Ana wants a space where she can put away her job device

So that she does not see them and remember about work all the time

Ana wants a proper room where she can have privacy while she works specially during video calls, also a high quality chair is so important to avoid back pain

Ana wants her own space for work so she can be more comfortable and productive

Ana wants a proper chair so she can avoid physical pain.

Ana wants a space where she can be herself doing a hobby for example

So that she can feel she has a safe space to express and focus on one thing being present

Ana wants a lot of plants in her work space So that she could feel more in peace, and

Ana wants to be more digital to transform spaces in a affordable way

So that she can make her spaces more cozy and pretty since she stays at home most of the time

Ana wants a ldevice that tracks how long she's being working

So that she can see how long that occupies her day

Ana wants at least one extra monitor, sometimes a laptop could be uncomfortable after many hours of work.

Ana wants to be part of a sports group so that she can have a motivation to go out and work out

Ex.:

Ana would like to have a device that reminds her when she has to finish work. So that she can be aware of her time.

Ana would like to have a... So that she can...

Ana would like to have a... So that she can...

Ana would like to have a... So that she can...

Group 3 - High

miro

Appendix

IV: Evaluation with potential users (UEQ)

Please rate the ideas!

As a part of my master thesis project three initial product ideas were developed, and now I would like to invite you to give your opinion about them.

The project that I am working on is related to one of the main struggles that people working from home are having, is feeling that there is not definite end to the work day, that they are not being productive enough and feel the need to continue working even neglecting their physical and mental health, lacking the energy to perform other activities after work and achieve personal goals.

Decide as spontaneously as possible which of the following conflicting terms better describes each idea. There is no "right" or "wrong" answer. Only your personal opinion counts!

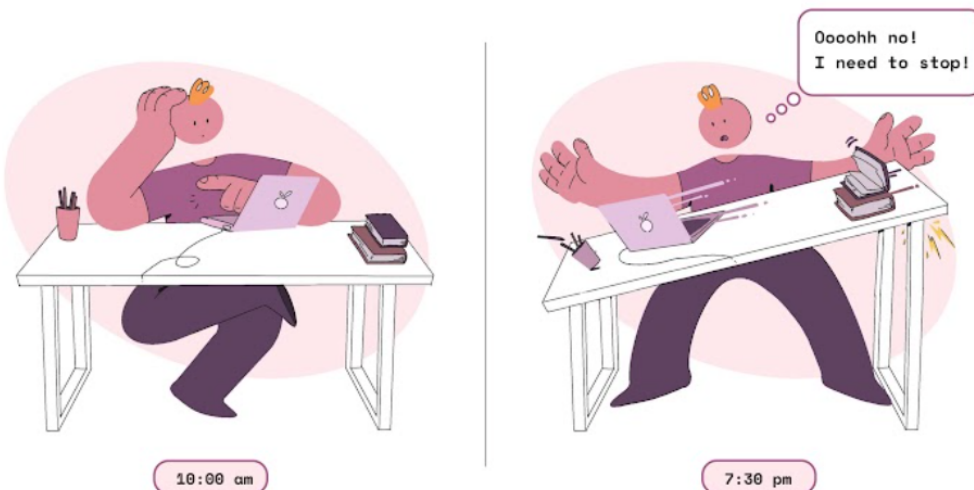
Idea 1 - Desk scale

As a metaphor for the balance scale, it represents work / life balance. It makes the imbalance of work at home visible and physical, interfering and directly affecting work conditions when the balance goals set by the user are not achieved.

How does it work?

This desk / standing desk has the standard hydraulic system to adjust the height with an added mode that inclines the surface, which can be turned on and off when convenient.

The mechanism will be linked to applications such as calendar or task managers, where it recognises the number of hours of work without interruption and begins to progressively incline the desk surface creating unfavourable conditions to continue working, until the user compensates it with personal activities to achieve balance and consequently a straight working surface.



1. *Mark only one oval.*

	1	2	3	4	5	6	7	
Obstructive	☐	☐	☐	☐	☐	☐	☐	Supportive

2. *Mark only one oval.*

	1	2	3	4	5	6	7	
Complicated	☐	☐	☐	☐	☐	☐	☐	Easy

3. *Mark only one oval.*

	1	2	3	4	5	6	7	
Inefficient	☐	☐	☐	☐	☐	☐	☐	Efficient

4. *Mark only one oval.*

	1	2	3	4	5	6	7	
Confusing	☐	☐	☐	☐	☐	☐	☐	Clear

5. *Mark only one oval.*

	1	2	3	4	5	6	7	
Boring	☐	☐	☐	☐	☐	☐	☐	Exciting

6. *Mark only one oval.*

	1	2	3	4	5	6	7	
Not interesting	☐	☐	☐	☐	☐	☐	☐	Interesting

7. *Mark only one oval.*

	1	2	3	4	5	6	7	
Conventional	☐	☐	☐	☐	☐	☐	☐	Inventive

8. *Mark only one oval.*

	1	2	3	4	5	6	7	
Usual	☐	☐	☐	☐	☐	☐	☐	Innovative

9. An open space in case you want to express an opinion or thought about the product concept:

Idea 2
- Bird
factor

As a reference of the cuckoo clock, the bird represents the user's personal life, which is being neglected by their work life, and shows how it's condition worsen during the working day without attending to their personal and health needs. It makes visible the long-term consequences of having an unbalanced work life and how it will negatively affect physical and mental health.

How does it work?

It will be linked to applications such as calendar or task managers, where it recognises the amount of working hours without interruption, the bird's exit intervals can be configured according to the activities of the day, or scheduled times, but if the user does not perform his/her personal goals the bird will begin to appear each time in worse conditions throughout the day.

From a fresh appearance and with a clear sound at the beginning of the day, to progressively deteriorate until reaching the maximum deterioration in its appearance with sound interference.



10. *Mark only one oval.*

	1	2	3	4	5	6	7	
Obstructive	☐	☐	☐	☐	☐	☐	☐	Supportive

11. *Mark only one oval.*

	1	2	3	4	5	6	7	
Complicated	☐	☐	☐	☐	☐	☐	☐	Easy

12. *Mark only one oval.*

	1	2	3	4	5	6	7	
Inefficient	☐	☐	☐	☐	☐	☐	☐	Efficient

13.

Mark only one oval.

[illegible]

14.

Mark only one oval.

[illegible]

15.

Mark only one oval.

[illegible]

16.

Mark only one oval.

[illegible]

17.

Mark only one oval.

[illegible]

18. An open space in case you want to express an opinion or thought about the product concept:

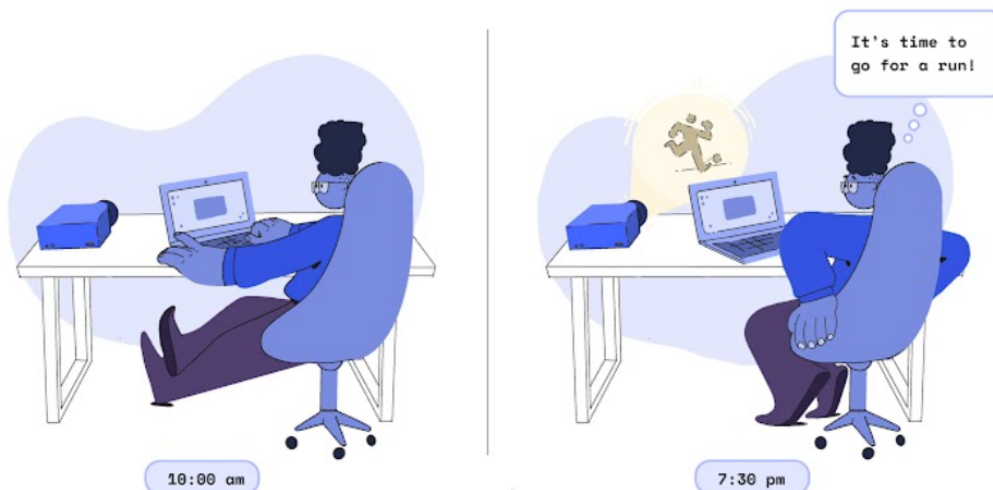
Idea
3 -
Time
Reels

With flexible working hours, setting limits and expectations is more important than time itself. The idea is that the user has a clear vision of the "stages of each day" expressed through a clock without numbers, that indicates the day progression with colors and a certain amount of marks, that will trigger the projection of videos or the so called "Reels", that are related to the marks or personal goals set by the user as motivational tool.

How does it work?

It will be linked to an application such as calendar or task manager and will ask the user to indicate the number of hours that he/she plans to work and to set the marks or personal goals of the day; Indicating for example stretching at mid morning and running at the end of the day, and when the clock gets to mid morning a Reel of someone stretching will be projected on the wall and at the end of the day a Reel of a person running will be projected on the wall.

This artifact will act as a reminder and motivation, projecting the user's goals and making them tangible and visual. This will help the user to achieve their personal goals, influencing and promoting positive and healthy habits into their work routine.



19. *Mark only one oval.*

	1	2	3	4	5	6	7	
Obstructive	☐	☐	☐	☐	☐	☐	☐	Supportive

20. *Mark only one oval.*

	1	2	3	4	5	6	7	
Complicated	☐	☐	☐	☐	☐	☐	☐	Easy

21. *Mark only one oval.*

	1	2	3	4	5	6	7	
Inefficient	☐	☐	☐	☐	☐	☐	☐	Efficient

22. *Mark only one oval.*

	1	2	3	4	5	6	7	
Confusing	☐	☐	☐	☐	☐	☐	☐	Clear

23. *Mark only one oval.*

	1	2	3	4	5	6	7	
Boring	☐	☐	☐	☐	☐	☐	☐	Exciting

24. *Mark only one oval.*

	1	2	3	4	5	6	7	
Not interesting	☐	☐	☐	☐	☐	☐	☐	Interesting

25. *Mark only one oval.*

	1	2	3	4	5	6	7	
Conventional	☐	☐	☐	☐	☐	☐	☐	Inventive

26. *Mark only one oval.*

	1	2	3	4	5	6	7	
Usual	☐	☐	☐	☐	☐	☐	☐	Innovative

27. An open space in case you want to express an opinion or thought about the product concept:

The
end!

Thank you for completing this survey, your opinion means a lot and will be of great help in developing the ideas further. And to conclude I would like to ask you;

28. Which of the three ideas do you prefer?

Mark only one oval.

☐ 1 - Desk scale

☐ 2 - Bird factor

☐ 3 - Time Reels

29. And about the idea that you preferred, how willing would you be to use it if it existed?

Mark only one oval.

	1	2	3	4	5	
Not at all	☐	☐	☐	☐	☐	Very much

30. An open space in case you want to express an opinion or thought about the ideas.

This content is neither created nor endorsed by Google.

Google Forms