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# The Totem Experience: A design intervention to enhance social well-being in Flexible Offices

Master's thesis in Industrial Design Engineering

Elena de la Fuente Crespo
Illán Riestra Nava

DEPARTMENT OF INDUSTRIAL & MATERIALS SCIENCE

DIVISION DESIGN & HUMAN FACTORS

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ELENA DE LA FUENTE CRESPO
ILLÁN RIESTRA NAVA

Department of Industrial & Material Science
*Division Design & Human Factors*
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ELENA DE LA FUENTE CRESPO & ILLÁN RIESTRA NAVA



Supervisor: Antonio Cobaleda, Department of Industrial & Material Science
Examiner: MariAnne Karlsson, Department of Industrial & Material Science

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Department of Industrial & Material Science
Division Design & Human Factors
Chalmers University of Technology
SE-412 96 Gothenburg
Telephone +46 31 772 1000

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# Abstract

An increasing number of companies are adopting Activity-based Flexible Offices (AFOs) in search of greater efficiency and lower running costs. These offices differ from traditional offices in that they consist of a number of different environments with unassigned workstations from where the employees can decide to work depending on their tasks (Danielsson, 2016).

The adoption of a new layout inevitably has an effect on the social dynamics at the office, which could affect the well-being at work. There is a gap in the literature about the relationship between AFOs and social well-being.

The goal of this project is to research this topic through a design intervention in a flexible office, following the Empirical Research through Design Method. The project performed interviews in a flexible office to identify opportunities for a design intervention in the office of study. The analysis of those interviews prompted formulating a set of assumptions of how social well-being could be enhanced through a design intervention. After an ideation phase, an experience and a mediating tool were prototyped to be validated in the office.

The result is the Totem Experience, an activity supported by a mediating tool, aiming to enhance the social scenario at the office by increasing social awareness and encouraging non-work-related conversations between all the employees, at the same time it provides a way for self-expression. The concept of Totem was tested in the office, getting generally favourable results that seem to prove the assumptions and to validate all the key goals of the intervention.

Keywords: Empirical research, Flexible offices, Social interaction, Social awareness

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# 1. Introduction

An increasing number of companies are adopting Activity-based Flexible Offices (AFO) in search of greater efficiency and lower running costs. These offices have the particularity of consisting of a number of different environments with unassigned workstations from where the employees can decide to work depending on their tasks (Danielsson, 2016). In consequence, how people interact with the space differs from traditional cell offices. Researchers have identified that AFOs enhance the information exchange between employees, performance, and creativity (Wohlers & Hertel, 2017). However, there is no universal agreement about this statement, and it is often debated whether it is a true phenomenon or not (Rolfö, 2018).

Despite the comprehensive research about practical benefits of flexible offices, there seems to be a shortage of research focusing on the well-being of employees. In this regard, there is a lack of coverage of social dynamics at AFOs, which is known to have connection with well-being and thus with health. This is particularly worrying knowing that there are concerns that AFOs could undermine social interaction, and have negative effects on health, satisfaction, and productivity (James et al., 2021).

Therefore, there is an opportunity to carry out a project around social well-being and social interaction in flexible offices. There is also the opportunity to develop a design intervention aiming to improve the social scenario in AFOs.

For these reasons, the goal with this master's thesis has been to carry out a study at a flexible office to assess the perceptions of employees about this space and the social scenario at work. Based on those findings, the authors have ideated a set of design interventions that could be successful at enhancing social well-being at the office of study. A prototype was made based on the most promising concept with the goal of validating the intervention. The prototype was studied in the same office of study, confirming most of the assumptions made during the design phase, and receiving generally favourable comments and a positive regard of its potential to promote the creation of a community and make employees closer to each other.

# 2. Project overview

In this section, an overview of the project is presented. It includes the aim of this work, the research questions that it attempts to answer, limitations for the work, and ethical considerations.

## 2.1. Aim and goal

The project aimed to deepen the understanding of the nexus between AFOs and social well-being, and to generate and test ideas to enhance the social well-being at the office. This was achieved through the study of a case flexible office in the area of Gothenburg, and the testing of a design intervention intended to enhance social interaction through face-to-face exchanges.

The goal was to identify in a case office which factors affect the social scenario and interactions, including factors related to physical space, culture and the social dynamics or personalities of employees. The project also aimed to evaluate employees' satisfaction with the AFO and the social scenario at the office. Finally, another goal was to identify, test and evaluate ways in which a design intervention can successfully improve employees' perceived social well-being.

## 2.2. Research Questions

The research questions that this master's thesis project attempts to answer are the following:

**RQ1**: What are the employees' perceptions of the social scenario at the AFO?
**RQ2**: How has the physical space at the office affected social interaction after the relocation?
**RQ3**: How can the social well-being at an AFO be enhanced through a design intervention?

## 2.3. Limitations / boundaries

The extent of the intervention included promoting or facilitating informal interactions such as casual encounters or chit-chat.

- Making a production cost analysis was out of scope.
- It was not considered within this project to address the manufacturability of the prototype, should it contain physical elements. However, production feasibility was considered.
- Only one iteration of the prototype was tested due to the time available.

## 2.4. Ethics and sustainability

Due to the nature of the topic and the expected intervention, the main ethical and sustainability considerations are related to the social aspect of sustainability. Therefore, to ensure an ethical approach, there needed to be some requirements that mainly affected the planning and implementation of user studies, including data collection.

The user studies and validation process needed to be planned to ensure, for example the right to opt-out and the non-traceability of participants. In addition, the interviews and experience sessions with participants had to be carried out in a way that did not lead to any discomfort for the interviewees.

Regarding the outcome of the design intervention, it was also required that the identified ways of enhancing well-being would not have detrimental side effects such as discomfort in the participants, undesirable distractions during work or privacy violations. Some other requirements were for the intervention to be non-addictive, safe, easy to use and have low invasiveness. To ensure this, questions on ethics and sustainability regarding the experience of the participants were included in the final survey during the validation process.

# 3. Process overview

The project is a practical application of ERDM principles to create a prototype to suit a certain Activity-based Flexible Office. This project has been developed together with an office of a Swedish public real-estate company located in the area of Gothenburg, Sweden.

This master's thesis project has been conducted according to the following phases: literature review, user studies, ideation, prototyping, and validation. The report also features two milestone sections with a description of goals and requirements of the design after the user studies, and an in-depth description of the design concept after the ideation. An overview of the process is shown in Figure 1.

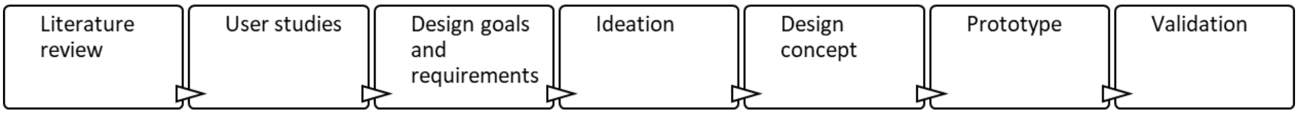



*Figure 1: Project process*

The **literature review** was used to broaden the understanding of the field of study and become familiar with the project. The study included AFOs, social well-being, social dynamics, and previous design interventions with a similar aim as the one formulated for this project. It was pursued to understand common issues with the topic of study, and to identify previous interventions with similar goals. These findings were used as a basis to define the specific aim of the project and the research questions.

The **user study** was carried out to identify design opportunities in the office of study. It was carried out through interviews with employees at the office, a visit to the space and a presentation of cultural and organizational information by the company. Eleven semi-structured interviews were carried out online and recorded. The transcripts were then analysed using qualitative data analysis and a user profiling to identify findings, which were later used to define relevant design opportunities and to understand to what extent later ideas would be suitable.

The **ideation** served the purpose of generating different ideas aiming at enhancing the situation in the office of study and defining assumptions that could be tested through a prototype. A dream scenario was envisioned, followed by a definition of key features that the intervention should consider, and then criteria for selection of ideas were defined based on those features. Ideas were then generated trying to accomplish the scenario. These ideas were evaluated following the selection criteria, weak concepts were abandoned, and stronger ones were developed further. The process was repeated until one idea emerged as superior to the remaining ones.

The **prototyping** phase aimed at creating a working prototype that could be sufficient to test the assumptions of the design. For that purpose, both a physical product and an experience were prototyped. Other supporting material to be used during the validation was also designed and developed, including material for promotion.

The **validation** stage served the purpose of answering the research questions, testing the assumptions, and measuring the impact of the prototype in the office of application. In the validation, the intervention was carried out. A survey that would provide both qualitative and quantitative data was designed and distributed to identify users' perceptions about the intervention.

The **final analysis** stage aimed at answering the research questions, validating the assumptions, and to describe the strong points and the weak points of the design intervention, also including suggestions for improvement.

The method and tools used will be further explained in detail in each corresponding section of the thesis report.

# 4. Literature review

A literature review was carried out to get a clear understanding of the context of application of the project. It was also intended that this step would provide the authors with insights about typical problems, previous interventions, and gaps in knowledge that could be relevant to explore further.

## 4.1. Aim and approach

Prior to the literature review and to guide the process, research questions were defined. The literature review aimed to answer the following questions:

- **LQ1**: What are Flexible Offices, and what are their main characteristics?
- **LQ2**: What is social well-being and how does it relate to social interaction and the office space in AFOs?

Following these research questions, four areas of research were defined: Flexible offices, Social Interaction, and Social Well-being.

The literature review began with a set of five initial articles that were provided by the tutor (Cobaleda Cordero et al., 2019; Colenberg et al., 2020; Danielsson, 2016; Keyson & Alonso, 2009; Olsson et al., 2020). From this point on, the review was carried out with two different approaches that took place simultaneously. The first one consisted of looking for articles that had been repeatedly cited in those first articles and which would be a basic source to the general context of the field. The purpose was to easily find valuable and trustworthy publications within a certain field.

The second approach consisted in searching thematically using an online academic database. The search engine used was Scopus. As search queries, relevant keywords that appeared more often in literature were used, looking for matches in Title and Abstract. Some of the keywords sought were: Flexible Offices, Activity-Based Offices, Social Interaction, and Well-being. Advanced search functions were used to narrow down the results when the list of literature that met the criteria became too broad. The search query was refined until the number of matching articles was adequate. The abstracts of all those articles were read to evaluate whether the matter of the publication could be relevant in any way, and if it was, the article was downloaded and written down on the database to be read later on.

Once a batch of articles was defined as potentially relevant, they were read again to identify useful information in each of them. The reading stage consisted of a quick reading of Abstract, Introduction, and Conclusions, specifically looking for references to the different areas of research. A "search" feature in the PDF reader was used to quickly search for relevant keywords (e.g., flexible office, well-being).

If, after a more careful reading, an article seemed to have weak connections to any of the areas, it was discarded. In the ones that were regarded as valuable for the project, relevant insights were highlighted in the document. Those insights included anything that could be useful later on, such as definitions, methodological choices, findings, or particularities of their context. After this, the articles were summarized in a document online to which both authors of this report had access. The summary included those things considered the more important in each publication, but also quotes and citations that would facilitate later when reporting the findings.

## 4.2. Findings

The findings from the literature review are detailed in this section. Findings are grouped by area of research: Flexible Offices, Social Well-being and Social Dynamics, and Previous work.

### 4.2.1. Flexible offices: main characteristics

Activity-based Flexible Offices are a type of office where there are no personal workstations, and there are different work environments (e.g., rooms for phone calls, focused work) that enable employees to choose freely where to work, including working from home. (Danielsson, 2016). AFOs are designed considering teleworking and are often dimensioned for under 70% of the workforce (Danielsson, 2016). The smaller office area translates into lower running costs. Furthermore, this type of office is also often considered to have other benefits such as increased opportunities for interaction and communication (Wohlers & Hertel, 2017), improved productivity and flexibility (Babapour Chafi, 2019), and employee satisfaction. However, researchers have also identified numerous problems and barriers with the use of AFOs. The results regarding employee satisfaction and performance in AFOs are though inconsistent (Rolfö, 2018). Some authors identify major drawbacks with this type of office, such as negative health and performance compared to traditional cell offices (Seddigh et al., 2014), lack of privacy, less work satisfaction, greater cognitive workload, and worse interpersonal relations (De Croon et al., 2005). In many cases, problems described in one study do not match those described by other authors in different spaces of application. Yet, a few issues seem to be common to most studies. Those are: lack of privacy, territoriality, and lower perceived performance.

**Privacy** is the perception of one's ability to control the level of social contact (Haapakangas et al., 2019). In open spaces, there is a greater frequency of uncontrolled interactions (Wohlers & Hertel, 2017) which accentuates the lack of privacy.

Privacy is closely related to **territoriality**, which can be defined as "the behavioural representation of feelings of ownership toward social or physical objects" (Zamani & Gum, 2019). While territoriality can lead to violations of desk-sharing policy, for instance, by leaving one's belongings on a desk while working somewhere else to keep "the spot". In a more moderate scenario, it has been found to positively affect the perceptions of employees and relationships with colleagues (Wohlers & Hertel, 2017). Positive outcomes have also been identified by asking employees for feedback and getting them involved in making changes to the space (Babapour Chafi, 2019). Babapour Chafi (2019) states that "the ability to manage and design one's work environment improves employees' work conditions, job satisfaction and productivity".

A lower perceived **performance** is also a common issue in AFOs. Some of the most common problems in flexible offices regarding performance are difficulties finding colleagues and time wasted changing workstations (Babapour Chafi, 2019). To counter this, workers tend to cluster in teams to enhance intra-team communication (Zamani & Gum, 2019). Environmental factors, like noise and light, also affect perceived performance and employee´s satisfaction (Gallacher et al., 2015).

Finally, as to satisfaction with the space, there are a number of elements that come into play. As mentioned before, privacy and perceived performance impact the satisfaction of employees with the

AFO. There is also a correlation between the satisfaction and the availability of alternative work settings that enable autonomy and mobility (Zamani & Gum, 2019). This includes the availability of desirable workstations. Some workstations have characteristics that make them less desirable, such as poor light, noise, negative associated feelings, or symbolic attributes (Babapour Chafi et al., 2020). A greater number of preferable workstations reduces competition over the best spots to work and reduces stress to find a place to work (Babapour Chafi et al., 2020).

### 4.2.2. Social Well-being in Flexible Offices

In this section, the findings are related to well-being and its social aspects, both at a theoretical level, as well as their implications in AFOs.

First, it is important to define basic terms which are the basis for this master thesis project. **Well-being** at work can be defined as “a subjective state, characterized by positive emotions and perceptions related to the context of work” (Haapakangas et al., 2019). **Social well-being** is the aspects related to the group, or community of employees, that affect this subjective emotional state or perceptions of the context of work. This has been identified by the World Health Organization (2006) as a key aspect affecting health. Its main characteristics are defined by Keyes (1998) as:

- Social integration is the feeling that one is part of a community.
- Social acceptance is when individuals trust other individuals of the community, think they are capable of kindness and that they are industrious.
- Social contribution is the belief that one has value and contributes to the community.
- Social coherence is the perception of the quality of the community, its organization and operations on a social level.
- Social actualization is the belief and trust in the development of the community.

These aspects are therefore perceptions and beliefs, which are highly affected by the culture and environment where the community interacts. In the case of this thesis project, the community is established as the force of employees working at an office. This means that the culture will be established by the company at an overarching level, and more specifically by the office managers.

Secondly, more into what the literature says about these aspects in AFOs, a concept very related to what Corey L. M. Keyes identifies as social acceptance, is **approachability**. In this type of office a general feeling of accessibility between co-workers is common (Haapakangas et al., 2019), but also a strong culture of social silos (Gallacher et al., 2015; Haapakangas et al., 2019; Olsson et al., 2020). The term “social silo” is used in this thesis to describe groups of people that interact mainly among themselves and rarely with other separate groups, which would be related to how is the community organized, how it operates and the term “social coherence”.

The existence of silos together with the general sense of accessibility is caused by a common problem in AFOs, which is the difficulty to find colleagues (Haapakangas et al., 2019). To solve this issue, team members tend to sit and work together in clusters. This could be the reason why employees often consider the collaboration and interaction with colleagues at AFOs as positive (Haapakangas et al., 2019; Zamani & Gum, 2019). Furthermore, these silos contribute to group identification, which is not only linked to social integration, but to job satisfaction and other behaviours related to group cohesion, cooperation and social support as well (Wohlers & Hertel, 2017). This same authors also advocate that there should be more engagement between colleagues from different teams at AFOs.

In relation to **approaches to enhance social well-being**, a variety of them have been tried by companies. Yet the most interesting one for this thesis project concerning social dynamics and interactions is related to workplace fun. Companies are said to assume that including fun activities will enhance the social assets at the company (Gallacher et al., 2015).

In this sense, there are two main types of approaches: top-down or bottom-up. A top-down approach is controlled by the company but has the risk of feeling fake or "mandatory" and not being as enjoyable as something spontaneous. At the same time, there seems to be no agreement on the meaning of "fun" (Bolton & Houlihan, 2009). Authors like Lamm and Meeks (2009) explain how "fun" can be different depending on age difference, which would make a top-down approach most suited for one group and not generalizable. On the other hand, a bottom-up approach cannot be controlled by the company and reaches the ones that experience it only, therefore it might not reach the employees that need it (Bolton & Houlihan, 2009).

On a different note, the literature found also highlighted that well-being is affected the **office plan and its attributes**. Authors like Cobaleda Cordero et al. (2019) have studied how elements like the space, its organization, colours or plants affect mood, stress, the perception of privacy and social relations between employees. In this regard, Haapakangas et al. (2019) state that, according to their results, companies should focus on privacy, communication and smoother workplace switching, to enhance productivity and well-being in AFOs.

### 4.2.3. Social dynamics on flexible offices

This section will present findings related to social dynamics: where they happen, what conversations are about and a peek into what other projects in this field have studied in this regard.

First, by looking up the terms "social" and "dynamics" on the Cambridge dictionary, **social dynamics** can be understood as the study of the behaviours and interactions of the individuals within a group while individuals are not working, as well as the study of the changes of the interactions within that group over time.

According to the literature, **common dynamics** at AFOs in the shape of small conversations take place in open areas and involve finding colleagues, stating where you are going to work, or casual updates related to work (Babapour Chafi et al., 2018). It is also frequent for these kinds of conversations to happen on the way to meetings, or while waiting for them in open areas (Babapour Chafi et al., 2018). As a result, in open areas, people feel obligated to greet and talk briefly to each other (Babapour Chafi et al., 2018).

As mentioned before, it is also common in AFOs that teammates sit together. However, a different scenario has also been observed in literature: when employees were not able to sit close to their colleagues, they often opted to go home (Colenberg et al., 2020). This dichotomy of usage of the space explains also findings that different offices present **very different communication patterns** (James et al., 2021).

Regarding **changes over time** of the interactions within the group, the literature which studied this found that satisfaction with communication and the sense of belonging to a community had decreased 3 and 12 months after a relocation to a flexible office (Haapakangas et al., 2019). The same authors found that other minor issues found 3 months after the relocation were no longer there when they repeated the study 9 months later.

The literature on case studies frequently focuses on enhancing general social interaction at the office using design interventions to promote encounters and interaction (Gallacher et al., 2015), increasing general awareness of breaks (Kirkham et al., 2013) or increasing social awareness between employees (Dhaval Vyas et al., 2007). **Social awareness** has been defined as "understanding of the activities of others, which provides a context for your own activity" (Dourish & Bellotti, 1992). This is tightly connected to the silo dynamics. Some cases from the literature will be further explained in section "4.2.4 Previous work" for their special relevance and key aspects concerning this thesis project.

### 4.2.4. Previous work

Interventions with a comparable aim to the one in this master's thesis project have been found in the literature. Learnings from peers working in similar scenarios were considered ´relevant for this work as they could provide the authors with tools and ideas to achieve better results. Four articles were considered particularly relevant, and they inspired the method and approach used in this work.

Regarding the approaches, it is interesting that each paper explored a different way to enhance social interaction. However, it is also interesting that three of the four articles focused on "social awareness" for their interventions. Social awareness can be defined as "'understanding of the activities of others, which provides a context for your own activity" (Kirkham et al., 2013). This is the case of the Break-time Barometer (Kirkham et al., 2013), Panorama (Dhaval Vyas et al., 2007), and Gelatine (Bilandzic et al., 2013). The fourth one, the Mood Squeezer, attempted to alter the culture at an office to make it more playful (Gallacher et al., 2015).

In the case of the **Break-time barometer**, researchers designed a device to inform users about the usage of break rooms at the office, increasing therefore social awareness, and "to encourage collectively taking breaks across the group" (Kirkham et al., 2013). The device could be described as a clock with a display that showed, for each hour, bars that represented the occupancy of break rooms. Hence, awareness is used as an enabler considering that it is the lack of understanding of what others do that hinders social interaction.

**Panorama** had a similar approach, but a broader less purpose-centred focus. This intervention is a screen that displays information from employees' personal lives, like pictures or accomplishments, that employees have previously submitted to be shown on the prototype. It "aimed at providing interpersonal and rich information related to co-workers and their everyday interactions in the department" and awareness is used "to support meaningful and valuable experiences by enhancing non-work-related social awareness" (Dhaval Vyas et al., 2007).

The third article described **Gelatine**, a display for a co-working space in a public library that shows the skills of people present at the space who are approachable to ask for help or to learn from them. The intervention addressed the lack of awareness about the abilities of people in the space and their willingness to be approached as the main limitation for spontaneous collaboration happening in the space. Upon arrival to the co-working space, participants could choose to write down their skills so they could be shown to other visitors, hence offering their help to whoever may need it. The intention was to provide a purpose for interaction through facilitating access to specific information. In other words, to communicate what some individuals can do, hoping that people in need would ask them for help. This way, they aimed to support social interaction and promote spontaneous collaboration in the space.

The final article concerned the **Mood Squeezer**. The intervention proposed in this case is an interactive display that can be changed through a physical control board in break rooms. This control board consists of a set of coloured balls that are connected to the display, so when a ball of a certain colour is squeezed, it lights up a bulb of the same colour in the screen. In this case, the authors aimed at creating a more playful environment in an otherwise serious office through a lightweight intervention. The resulting intervention was a physical design called Mood Squeezer. A secondary goal with this device was to create something that triggered reflection and could give a topic of conversation.

The first two articles showed interesting approaches to enable and sustain social interaction. However, their results were inconclusive, the most valuable finding being that "the iterative approach, which deploys and evaluates functional prototypes in the field, appears to offer some promise" (Kirkham et al., 2013).

In this case, Gelatine gave more insights into the field, even if the results show very limited success in the intervention. As the authors explain, people did not engage with the prototype because they entered the space with a predefined task to do and hence paid little attention to the system, or just had no intention to engage in social interaction (Bilandzic et al., 2013). Gelatine is a useful example of how the culture of a space can enable or hinder certain activities, and how sometimes a culture needs to be resignified for an intervention to work. Moreover, the article also shows that a predisposition to social interaction is needed, and it is not enough to merely provide a purpose.

As to the results from Mood Squeezer, the authors claim that it managed to change the social dynamics at the office, making advances towards a more "playful" office. What is interesting is that authors also identified changes in social dynamics, such as the emergence of new social norms, or the use of the product as an icebreaker (Gallacher et al., 2015). From their findings, it is interesting to point out that they seem to prove that the culture of a space can be altered by the inclusion of a design intervention. Hence, together with the learnings from Gelatine, social interaction can be indirectly enhanced by deploying a prototype that transforms the culture of the space.

The method used in these four cases was also a relevant matter of study and comparison. All of the projects collected both quantitative and qualitative data. In the case of Mood Squeezer, the quantitative method provided data regarding how much the product was used over time, while the qualitative approach gave complementary insights regarding perceptions and implications of the design. Regarding the gathering of qualitative data, semi-structured interviews and questionnaires were the most used resources. However, the Panorama project also featured other methods like observations and cultural probes, which turned out to be vital for their research. This paper encourages widening the tools considered beyond the most common traditional approaches.

## 4.3. Conclusion and design implications

Overall, through the literature study, it was noted that there are some issues and benefits of AFOs that authors do not agree upon. While in some offices, collaboration between employees and perceived performance seem to be enhanced with the relocation, other researchers find that AFOs reduce the perceived performance. Due to the discrepancies between publications, it can be interesting to evaluate what the perceptions are at the office of study, since it could be related to the social aspect of social contribution, where individuals need to believe that they add value to the community.

The literature also revealed a list of problems of common occurrence in AFOs. The key identified problems were the lack of privacy and the territoriality of employees. Again, these problems are not perceived in all flexible offices studied and reported in the literature. In consequence, these common issues will be used as part of the inquiry during the user studies, as means to understand if the office of study suffers from any of them.

Regarding social well-being, the literature has contributed to find and understand different aspects that the intervention could target or use as means to enhance the current social well-being of employees. Those are the five aspects of social well-being: social integration, social acceptance, social contribution, social coherence and social actualization; as well as social awareness. The physical space could be targeted as well, but it is considered that the intervention would not be of such a big scale as making big changes on the office plan and its attributes.

As to communication patterns, this has been recognized as an aspect that affects the organization of the different groups and the cohesion between employees. Yet, the literature stresses that there are very different patterns across offices, which makes it a key aspect to study and to understand through the user studies.

Finally, from the case studies it became apparent that social awareness can have an impact in social well-being. The papers studied were also useful to identify barriers to social interaction that could be addressed through a design intervention. For example, the lack of purpose to start conversations, or the culture of the office. Findings from previous work will be used to shape the user studies to see if these same barriers happen in the office of study.

# 5. User studies

This section explains the work done concerning the user study which was accomplished at one specific office. The section is divided into the following subsections: aim, initial study, method, and findings.

## 5.1. Aim

The user study was planned to answer research questions, other relevant questions that arose in the literature phase, and to explore the scenario at the office. The research questions of the project that were addressed in this stage are:

RQ1: What are employees' perceptions of the social scenario at the AFO?

RQ2: How has the physical space at the office affected social interaction after the relocation?

Based on these and on interesting findings from literature, the following additional questions for the user studies were defined:

Q1: How does the physical AFO affect the social interaction at the office?

Q2: What kind of problems do employees' experience regarding social interaction?

A few more explorative questions, not directly related to the literature, emerged as relevant to research the issue more in-depth. Those are:

Q3: What are the perceptions of the social scenario at the flexible office?

Q4: What does a normal day at the flexible office look like?

Q5: What kind of activities exist that enable or facilitate social interaction?

With these questions, the intention was to spot if any of the typical problems with AFOs, as described in the literature, occurred in the specific office. It was also expected to find other barriers to social interaction that are particular to the place of study. The final goal was to identify which spaces are underused or overused, including for which purposes (e.g., which spaces are more/less social, more/less work-centred) intending to identify potential places to place the intervention.

## 5.2. Initial study

Before starting the user study plan, there was a study visit to the company premises to learn about the space of application. The visit also included an informal conversation with our contact in the space to learn more about the culture of the office and the company as a whole. This provided a wide range of insights that are worth commenting upon.

The most important learning was that the office was quite new. Employees had moved from five different traditional cell-offices to the new flexible office only around a year and a half before the visit. However, due to the Covid-19 pandemic, most employees only worked in the new office for around six months before being advised to work from home. At the time that this study was carried out, employees were still working from home. This had two main implications. First, the employees used to work in different offices and belonged to different departments, therefore they seldom had any contact. Secondly, for most employees the novelty effect of moving to a new layout could still be present.

In relation to their experience in the AFO, initially most of the employees used to go to the office four or five days per week, while in this new context they would go once or twice per month, if ever. This means they have worked at the office at full occupancy for around six months before having to work from home for around a year. Naturally, there are also some exceptions of employees that must work at the office still under the current circumstances. Only around 10-30 people worked at the office at the same time during the pandemic, as opposed to the 100 that did so before the pandemic.

*Figure 2: Case office space*

The visit was also useful to understand the physical space, knowing the different types of spaces in the office, the furniture, and to get an idea of the environment as a whole and the feel of it. Two indicative images of the space can be found above (Figure 2). This knowledge turned out to be valuable when writing the script for, conduct, and interpret the interviews. The conversation with the contact person at the office also revealed previous actions and future plans of the company to enhance the social scenario in the workplace, including their priorities and main struggles.

In sum, the knowledge attained in this session was particularly useful when planning and carrying out the user study. The superior understanding of the physical space enabled more in-depth questions during the interviews. Furthermore, together with the literature review, the visit helped to understand where and how different types of interaction were more likely to happen.

## 5.3. User study

This section will elaborate on the method, and process by which the user study was carried out.

### 5.3.1. Method

The process of the user study included: design the data collection method, finding participants, carrying out the interviews and analysing the results. The tools used, decisions made, and the methods followed for each stage are explained in detail in the following subsections.

#### 5.3.1.1. Data collection

The user study involved individual semi-structured interviews carried out digitally. The interview followed a flexible script that can be consulted in

Appendix: Interview script (page ii). The script included both narrow and broad questions to answer the more specific questions posed (Q1-Q3) as well as the more explorative ones (Q4-Q5). For the open questions, follow-ups were defined to help the interviewee elaborate on those topics that were more relevant for the study.

The interview script was written to study three different areas: use of the space & culture, activities, and social interaction. Questions regarding perceptions and personal reflection were included for all three areas. Regarding culture (since it was thoroughly explained during the study of the space of application) the questions in interviews were limited to participants' perceptions on the issue. These areas inspired an interview divided into four parts: (1) the daily routine regarding the use of the space, (2) enablers and barriers to social interaction, (3) activities, and (4) future expectations and suggestions. In addition to these parts, there were introductory and concluding phases, where interviewees were informed about the goals of the study, expected results, and other general information.

The interviews were carried out in a digital environment that had supporting tools to facilitate the conversation and help the interviewees explain their thoughts. The support space is shown in Figure 3. It had different sections for the different parts of the interview, with relevant tools to support each phase (e.g., a map of the office, or written questions for the most difficult inquiries).

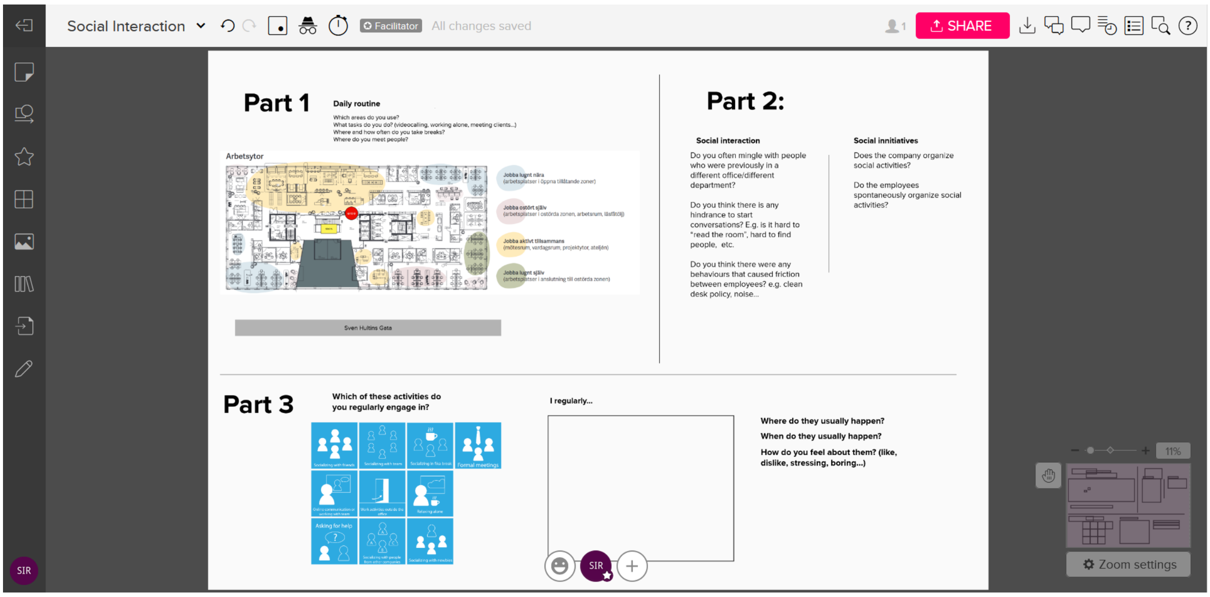



*Figure 3: Digital environment*

As mentioned before, the first part of the interview concerned their daily usage of the space. This was an introductory phase, aiming at getting the participants in the mind state of giving detailed answers, and understanding what topics were being researched. Participants were asked to narrate what a typical day at the office looked like, highlighting those spaces that they used the most and the least, as well as where and when social interactions happened. Since most employees had been working from home for the previous months, they were reminded to stick to their routine when they were working in the office on a daily basis. To support their explanations, the online platform showed a map of the office where they could point out different spaces and different moves that they considered relevant for their routine. The main goal with these questions was to identify areas and times where/when a certain design intervention could work best.

The second stage aimed at identifying enablers and barriers to social interaction. It consisted of a set of questions regarding different aspects of social interaction (e.g., meet people from other departments, compliance with clean desk policy, ease or barriers to starting casual conversations, topics of conversation, etc.). These questions were thought to be hard to understand if merely asked aloud. To facilitate the comprehension, questions were written down in the digital space so interviewees could read them carefully. The main objective of this part was to identify problems that could be subject to a design intervention.

The third stage had the purpose to identify which less work-oriented activities happened at the office, learn who organizes them, and the employee's perceptions about them. Following the criteria in literature, the script addressed both 'organic fun' and 'packaged fun'. "Packaged fun" was to be discussed when asking about the activities that the company organizes, while the "organic fun" was addressed through a card sorting activity The activity consisted of a set of cards describing different situations of typical occurrence (e.g., formal meetings, socializing during a 'fika' break, work activities outside the office space) to identify which situations are more frequent and preferred. The activities used in the cards were inspired by those described by Colenberg et al. (2020). With this, it was intended to understand the preferences of employees when it comes to social interaction, and hence identify opportunities for a design intervention.

Finally, the last stage was a general reflection and the chance for participants to share their ideas for the future. Given the previous stages, participants would probably have had time to think about these topics to an extent where they might come up with suggestions or other types of reflections. In this stage, participants were asked some general questions to encourage them to share those ideas. There were also questions about how they expected to work after the pandemic, to identify opportunities and limitations for the design intervention.

#### 5.3.1.2. Finding participants

The search for participants was done in collaboration with the contact person at the office. The request for participants consisted of an email explaining the goal of the study, which also had a link to a sign-up form. In that form, employees were asked to provide availability and contact information in order to set a time and date for the interview.

The email was sent to our contact in the office, in order to be forwarded to all employees. The goal was to get as many answers as possible to later apply criteria for sampling. However, this turned out to not be necessary since the number of candidates was not too many (n=12) and varied enough to be considered a representative sample.

Hence, all the candidates were accepted and were proposed a date and time for when to carry out the interview. In the end, one participant could not make it to the interview due to personal reasons, and hence 11 interviews took place. It is important to point out that the contact person also took part in the interviews.

#### 5.3.1.3. Conducting the interview

The interview was carried out digitally, through a video call. Both authors attended every interview, and each was assigned a specific role. One would lead the study, and the other one would transcribe in real time what was being said so that the data could be analysed later. The audio of the session was recorded always in case it was needed to fill in things that might have been skipped in the live transcription. For this reason, interviewees were informed upon arrival about the intention to record the audio and were asked for consent before starting the recording.

Participants were asked if they were familiar with the platform and received a short explanation about the basics if they were new to it. Regarding the facilitating tools, they were accessed by the interviewee by a link provided during the interview.

Interviews were designed to last around 60 minutes and took between 45 minutes to 1 hour 20 minutes. Interviews ran smoothly except for minor internet connection losses.

It should be pointed out that small changes were made to both the script and the tools after the first few interviews. It was not possible to have a pilot interview, hence, the first times the interviews were conducted also revealed areas of improvement to the script and protocol. There was one addition of a question that came up spontaneously during the first interview (*Were social activities in your previous work different*?), which provided interesting information and was therefore added to the transcript, so every interviewee answered it. Other changes were small modifications included for clarity, such as adding some more written questions to the online platform and dividing certain questions in the script into two separate questions. It is worth mentioning that there was not a big change in the answers after the changes were made, other than the interviews running more smoothly. Hence, the answers from early and later interviews are comparable and equally valid, as proven by the results.

#### 5.3.1.4. Analysis

A qualitative data analysis was performed to identify relevant findings from the interviews. Interviews were analysed using free software designed for qualitative data analysis. The analysis of the interviews aimed to find answers to the research questions and to obtain findings that would set the ground for the ideation, prototyping and validation phases. The analysis was performed from two different approaches, described in Figure 4. One method was a thematic content analysis to identify patterns and shared opinions, and the other method was a behavioural profiling based on each participant's attitude towards socializing.

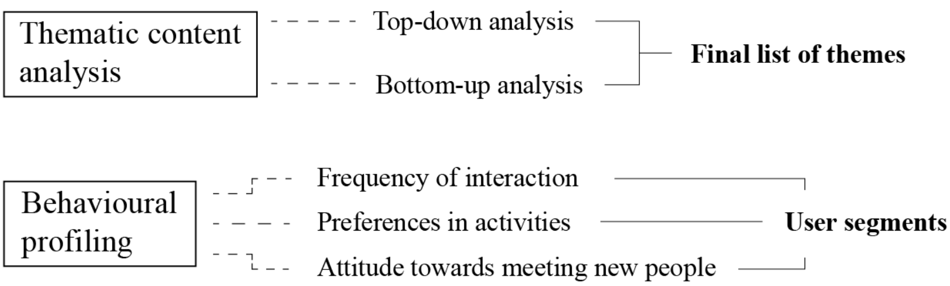



*Figure 4: User studies validation method*

The **thematic content analysis** was carried out to identify common themes across interviews. The analysis was performed with help of a free software that facilitates the identification of common themes across interviews. The method for the analysis was twofold: a top-down approach and a bottom-up approach. In the top-down approach, the authors actively looked for mentions of predefined themes that corresponded to the research questions, such as "social activities", "spaces" or "problems". In the bottom-up approach, the authors identified common themes across interviewees that were not necessarily considered in the beginning. Both top-down and bottom-up approaches were merged in the end to define a single list of themes. This list of themes was used later on to create a collection of quotes from interviews that answered or were related to a certain topic. This way, it was ensured that all relevant statements from interviews were correctly labelled.

Simultaneously to the thematic content analysis, a **behavioural profiling** was performed. The behavioural profiling had the goal to find different user groups (their attitudes and preferences towards social interaction) with the intention to later design a solution matching employees' personalities to ensure acceptance. The profiling was based on the transcripts from each participants' answers, looking for relevant answers related to their personality and preferences regarding social interaction. Specifically, paying special attention to when and how often they socialized (i.e., during work hours, after work hours), with whom (i.e., inner circle, whole office), which types of activities they mentioned to enjoy more or less (e.g., company- vs. employee-organized, competitions, lectures, etc.) and the ambience that they preferred (e.g., smaller groups or company-wide-activities). Then, out of the answers, a general profile of the individual was written, and then compared to the others to seek similarities and differences and then create the final user group profiles.

The result of both approaches was an organized collection of quotes referring to the different themes. The general topics of discussion are grouped into three categories: Social interaction, Activities, and Physical Space. Those topics are the same as those of the thematic content analysis. **Social interaction** includes reflections about when and where social interaction happens, perceived barriers, and general thoughts on them. **Activities** include what kind of activities happened at the office, who organized different activities, and suggestions for future activities. **Space** included how people used different areas in the office, and problems with the physical space.

## 5.4. Findings

In the following section, an overview of the results from the user studies and a complete discussion of the insights from the interviews can be found.

In the end, the sample of 11 interviewees consisted of six males and five females, which is a similar gender ratio to the one at the office. As to their time working at the company, it ranged from six months to 28 years. In terms of departments, interviewees came from IT (three), HR (one), finances (one), accounting (one), engineering (one), service (one), and project management (three). There were representatives from the major departments at the company. However, it is important to mention that the structure of the workforce and employees per department were provided to the authors. Thus, it was found out that this was much more intricate than the departments described above, which made checking if the sampling was representative a challenge. Yet, considering the information available and the fact that the contact at the office agreed to it, it is reasonable to state that the participants supposed a good representation of the office employees.

Regarding the answers to the interviews, it is fair to consider that a saturation point was achieved after around nine interviews. Later interviews seemed to repeat the same thoughts as the previous participants.

The results of the interviews are detailed and discussed below, highlighting the implications for the project and the similarities or differences with what was found in the literature. Findings are supported by quotes from interviewees, and references to which interviewees shared a certain idea are indicated as follows: (Ixx, Iyy, …) where 'xx' and 'yy' are the corresponding code of the participant (1-11).

Findings are grouped into three categories: use of space, activities, and social scenario & interaction. These categories follow the three areas of study of the interviews.

### 5.4.1. Use of space

The space in the office was divided into different sections according to how much noise was accepted in each of them, ranging from spaces where one could work quietly in groups, to areas for individual work in complete silence. There were other supporting spaces for phone calls, focused work, and team meetings or work in teams. There was also 'the lounge', which was officially a space for active group work, but it seemed to remain in between a social space and a working space. Two participants suggested that the reason behind this use seems to be that the available furniture is not suited for work due to poor ergonomics. The participants who did use the space for work-related things mainly engaged in meetings with colleagues.

There are a few factors that could be the cause this under-usage of the lounge. One is **noise**. Noise was reportedly an issue in the office, and particularly bad in the lounge. One participant said: "The lounge area does not work because you can't do more things at the same time, open meetings are too noisy, and you don't have the right borders" (I11). However, in addition to noise, there could have been a lack of understanding of the **purpose** of the space. The furniture of the area clearly favours casual conversations, but supports poorly more traditional work, and at the same time it is neither an obvious social area. Examples of this can be found in the interviews: "I'd like a place more like a break room, that I can just watch the news or something" (I4) or "In previous offices we had own lunchroom, quiet, we can talk together. I would like a lunchroom" (I5).

> There is an opportunity for a design intervention aiming to resignify the space and make it exclusively social. Preliminary ideas in this regard include adding equipment that can be universally understood as non-work related to have explicit examples of the social nature of the space.

*Figure 5: Area beyond the lounge*

The area beyond the lounge can be seen in Figure 5 (above). In this area, several **spatial problems** were identified. One concerns the division of the space, and the dynamics that it enabled in the office. For example, teams that have to work more often in groups, or benefit from quick spontaneous exchanges of information, had to work together in the same 'work in groups quietly' area. This led to *de facto* appropriation of different areas for different departments. Appropriation of spaces in pursuit of enhanced intra-team communication was a phenomenon noted in the literature (Zamani & Gum, 2019). However, from the interviews, it became apparent that this behaviour was generalized at the office since seven out of the 11 interviewees said that they always sat in the same area with their teams, and only people from the team used that area.

Despite this appropriation of the space, other territorial behaviours described in the literature were not found in this office. For example, no interviewees identified violations of desk-sharing rules (as described by Wohlers & Hertel, 2017), or the existence of competition for workstations (as described by Babapour Chafi et al., 2020). However, there was an occasional shortage of desirable workstations in top occupancy times. One of the interviewees said: "Sometimes it is hard to find places to sit, but only Mondays 9-10" (I6) and another made a similar comment: "Sometimes it is not easy to find a workstation, you could sit in the living room but…" (I13).

> In this regard, there is little room for a design intervention, since interviewees seemed content with the use of the space.

It is also worth mentioning the supporting "small rooms" at the office. An example of these can be found in Figure 6. The workplace featured smaller rooms for other activities, including phone calls, focus work, and group work. Spaces for meetings and focus work had to be booked beforehand, whereas rooms for phone calls were accessible anytime. There was no agreement about the availability of small rooms among the interviewees. While some participants claimed that the number of rooms was insufficient, others said that there was only seldom a shortage of them. While this is not regarded as a major problem, it is suspected that there is a link between the availability of small rooms and employee satisfaction with the space, similar to what is described by Zamani and Gum (2019). This seems to be supported by the complaints of employees, which were almost exclusively related to how easy it was to find spaces for working focused or to have a phone call, in addition to those regarding environmental problems such as noise.

*Figure 6: Small rooms*

In line with this, and supported by literature, it is reasonable to address the perceived efficiency in AFOs. One common counterpoint for AFOs is that they can be considered inefficient. Some common arguments are that AFOs force people to move around more, and spend time thinking where to sit, which can lead to lower perceived performance (Rolfö, 2018), and that increased noise, lower privacy, and more uncontrolled social interactions can lead to lower efficiency (Wohlers & Hertel, 2017). According to the interviewees, noise is a problem for some, but it is not a general problem that affects efficiency. There was only one answer regarding uncontrolled social interactions: "The social behaviour in this office can be too much, takes down progress. Some people like to talk a lot" (I5).

When asked about their opinions about having to walk around the office, for example to find colleagues, all interviewees seemed content. Some were even happy to be forced to move around. This is the case for interviewee I8, who said: "I like that you have to change your location quite a lot. It also changes your mindset in some sense, from walking from one space to the other". The same participant also added that it is an extra chance to meet people and have a short interaction with colleagues: "You meet many people near the entrance while moving and have a small chat". Only one interviewee complained about having to move around to make copies as being not efficient but, in general terms, the increased movement around the office is not generally perceived as an annoyance but regarded positively.

This could have a direct implication for the design intervention since a way to enhance social interaction could be to foster these short casual encounters while in transit.

### 5.4.2. Activities

The company strives to actively create a suitable scenario where social interactions happen regularly and organically. Their efforts come in the shape of transforming and communicating the culture through various interventions, as well as organizing activities that promote that desired scenario. In terms of the culture, most interviewees identified positive characteristics such as 'being welcoming', feeling 'natural' to meet people, and "easy to meet new people". Hence, it is fair to say that the efforts from the company to create a good environment for social interaction have been successful. There is however something that strikes from the interviews; that most interviewees seemed to refer mainly to work-related conversations when they talked about the interactions that happened at the office: "I have no time to talk about anything other than work" (I5). In this regard, there is doubt that the company is promoting the right message. From the interview with our contact at the office, it became clear that the goal was to enable more social (less work-related) conversations and to highlight the value of social encounters, but employees seem to have understood differently what they are allowed and expected to do.

After conversations with the contact at the office, it was understood by the authors that the company organized numerous social activities. The interviews intended to explore which kind of activities employees are aware of and to learn about which activities are the most popular. The answers revealed what could be a problem since there is no agreement amongst participants.

Firstly, when asked about which **activities were organized by the company**, there was disparity in the answers. Almost all interviewees identified the existence of seasonal parties (e.g., Christmas party, Midsummer party, etc). However, other activities like yoga classes, quiz nights, or a wine tasting course, were mentioned only by a small number of participants. It is worth mentioning that some of these later activities are not organized by the company, but by the administrators of the building where the office is located. Furthermore, only two interviewees recognized the existence of lectures during Friday breakfasts, which is something that the company does organize, as mentioned by the contact in the office. Hence, it is unclear whether there is ineffective communication of the existing activities, or if it was a misunderstanding during the interview and the employees did not fully understand the extent of the question. This uncertainty has been acknowledged and the answers to these questions were not used as hard evidence for findings.

Secondly, when asked about which **activities the employees organized**, a similar phenomenon was observed. Some answers attributed the previously mentioned activities like "yoga classes" to the employees instead of to the company, which supports the idea of a lack of effective communication of the activities. However, most interviewees did agree on the existence of frequent employee-organized afterwork activities. However, these afterwork activities are almost entirely departmental. The implications of this are clear: people from the same departments not only spend more time together at work, but also spend more time outside work, hence reinforcing the boundaries between silos. One participant had an interesting reflection on why afterwork activities could be more common within departments: "With smaller groups, it is easier to organize things" (I5). It is worth noting that the office has over a hundred employees.

This evidences the importance of a design intervention that aims at creating activities for all employees across departments to counter the effects of current dynamics leading to more isolated silos. Furthermore, a design intervention should consider the challenge of organising things with such a number of employees. Features like ease of set-up, ease to organise, and accessibility are particularly crucial in this scenario.

Moving on to **the preferences of employees**, the intention with the interviews was to identify the different perceptions regarding employee-organized and company-organized activities, to maybe identify barriers and enablers to office fun. From the literature it was noted that some profiles could have negative opinions of "fun activities" organized by the company, considering that the organization only promotes such activities because it is beneficial for their own interests (Bolton & Houlihan, 2009). The interview aimed at exploring this topic in order to identify possible barriers and things that should be considered in the ideation stage. However, the results show that there is no evidence that employees want to avoid company-organized activities. Of all participants, only one stated openly that he preferred activities that originated from the employees. It is worth mentioning that when asked about which things they would like to do after the pandemic to get closer to their colleagues, many mentioned activities which directly involved the company (e.g., a competition between employees, more breakfasts, regular afterwork with all office employees), which leads to the conclusion that negative cynical behaviour described by Bolton and Houlihan (2009) is not present at the office of study.

What was more important during the interviews was to get the preferences of employees regarding a potential new activity. For that purpose, participants were asked to express what new things they would like to see at the office. Almost all seemed content with just having small activities more often (e.g., afterwork, lectures, lunch). Some interviewees did go further and provided new ideas of what they would like to have at the office. A common topic in this regard was games. One participant made the following reflection about games: "When you do something together, you tend to talk in a different way" (I6), implying that the interactions that happen with the support of games are of a different nature than what usually happens naturally.

One thing to keep in mind is the different profiles at the office. Not all employees had the same opinion, and it is fair to believe that they would have different attitudes towards games in the office as well. This also includes generation related differences in the understanding of office fun, as those researched by Lamm and Meeks (2009).

Hence, a key factor for the success of a design intervention is to understand different attitudes and points of view. Despite all, from the interviews it became apparent that there is a will to add more fun features, such as some kind of game, to give purpose to social interaction and improve the ambience.

### 5.4.3. Social scenario & social interaction

One of the goals of the user studies was to identify the employees' overall **satisfaction with the social scenario** at the office (Q3). In this regard, the results varied a lot from one participant to the next and were strongly related to each one's personality. In any case, there seems to be a general agreement that social interaction happens easily and naturally at the office. Six out of the 11 interviewees stated that they were happy with the social scenario. Of those six, four had no problems at all, while the remaining two identified some limitations that could be improved. The remaining five either had trouble socializing or seemed content with low social interaction. Four of these five were very work-centred and were happy to not have much social interaction at the office. Of these four, two said that they would like social activities with their colleagues, but they should happen after work hours since they are busy in office time. One participant said: “We need to be efficient. I have no time to go around and talk and meet people over break” (I5). This means that only one interviewee had an interest in socializing at the office but faced problems that made it difficult. However, it is worth noting that this participant had only been working for a few months in the company. Considering the situation of low occupancy that characterized the months prior to the interview, this participant’s difficulties could probably ease off on its own once the situation is normal again.

Another interesting point of the research was to identify **problems regarding social interaction**. Interviewees shared their opinions about this matter, revealing a set of problems that allegedly happened at the office. One of those was “not having a topic of conversation”. The lack of purpose and topic to start a conversation is a topic treated extensively in the literature (e.g., Dhaval Vyas et al., 2007; Gallacher et al., 201). In this study, the issue was mentioned by three participants, of which one said: “It's hard to talk to people from other disciplines because we don't have that much in common. We could talk about weather but... ” (I1). What is surprising about this statement is that even when talking about social interaction, boundaries between disciplines seemed to still play a role.

On this topic, three participants talked about how existing silos could hinder socializing at the office. One of them said: “I can see we are still thinking we are different offices because we come from five (different offices) and are still separated in our minds” (I6). On a similar note, another interviewee shared the following: “There are still things from the culture of previous offices. Maybe we don't understand each other because of hidden expectations that are not communicated” (I11). This could explain why the pre-existing groups have endured the relocation. Each old office had their own “culture” that they could keep after moving to the AFO. Furthermore, highly intra-departmental work becomes an obstacle to interacting with people from other departments, and thus hinders the merging of the old offices in one single, new, common culture. Nevertheless, some interviewees did agree that the office was getting closer, and they are moving towards becoming a community.

> There is an opportunity to reduce hindrances to inter-silo interaction, and thus promote the creation of a community. An intervention should focus on creating the encounters between people that do not interact often and facilitate conversations by giving a topic or a purpose to interact.

Regarding social interaction and dynamics, three interviewees shared that sometimes it was difficult to know if a group of people in a common area was socializing or working. One participant said: “When we sit in the living room it’s sometimes hard to know if they are job-related or social conversation” (I10). Regarding use of space, it was discussed that the ‘lounge’ was supposedly conceived to be a space to work, but it was best suited for merely social interaction. It seems as though a lack of definition of the purpose of the space sometimes leads to difficulties to ‘read the room’. It is worth mentioning that two of the three participants clarified that they did not see it as a big hindrance: “I can ask if it is ok to sit down and they can say ‘no, we are working’ ” (I11).

Finally, in Dhaval Vyas et al. (2007), it is stated that “social awareness is neglected in the tension of heavy workloads”. This seems to agree with the studied case where, for instance, I3 said: “I love my work and talking to the people I work with, but sometimes you are too stressed to even take a fika break”.

As to **when and where social interaction happen**s, according to the interviews, the entrance (where the coffee machine is) is the most social area: “It’s always easy. You can go to the lounge where the coffee is and there is always somebody talking and welcoming in the conversation” (I4). This was mentioned by most interviewees. The next most mentioned spaces for social interaction were the restaurant and the lounge area. The restaurant was declared to be used for lunch and fika by four interviewees, while the lounge area was used for different purposes: few interviewees went there to talk to people or wait for them, one used it scarcely to have fika with her closest circle, and another used it to relax alone, as well as to have casual conversations. Finally, the corridors were also mentioned as places to have a quick conversation.

Regarding when social interaction is happening, seven out of 11 interviewees mentioned the fika break. Another time that some interviewees mentioned was early in the morning. One of the interviewees commented that “When you are at the office at 7:30 it is easier to have that chat because everybody knows you don't have meetings” (I8), and another said that they would stay and socialize after meetings. Another interviewee mentioned that they only socialize at lunch and with colleagues: “I always go out and eat outside the premises with my colleagues” (I9). Most did not mention lunch at all but considering that it is a policy to not eat at the office, and the fact that employees are strongly encouraged to have lunch at the building´s restaurant, there was probably a lack of communication in this sense.

Another consideration about when interaction happens is the openness of employees to meet colleagues after work time. This seemed to not be a problem for most participants, as understood from the positive view of departmental afterwork, but one interviewee said that they would like to keep work-related things to workhours, and not meet people outside these hours: “I am not a fan to socialize when I am off duty. I can talk on-site, and are not afraid to have personal conversations, but not later” (I10).

> Struggles to know if people are in meetings or resting can be a hindrance to social interaction. There is an opportunity to increase the awareness or to clearly distinguish people working from people willing to talk. Furthermore, the high workload of meetings that employees at the office have makes it crucial for the intervention to find a suitable time at the day when all employees are available, and preferably during working hours.

Finally, as a more **general overview,** the culture at the office should be described. The culture is perceived as good and an enabler of positive social interaction. For example, some interviewees said that “It's easy to relax when not at work (but in working hours)” (I2), and “I think everyone is very welcoming even if you have never talked to them before” (I4). Others even declared that it was easier to meet new people, that it felt natural and that they met more people now “It feels more natural to meet in this office than it was before” (I4). Three interviewees also mentioned that it was very easy to talk to everyone. Hence, it became apparent that the culture promoted by the company as well as the environment of the workspace facilitate social interaction.

Other general comments were that it is hard to be new at the office, and that it can get too noisy when you try to concentrate: “Social behaviour in this office can be too much” (I5). In relation to the literature, some studies report greater collaboration between employees in AFOs (Wohlers & Hertel, 2017). However, the authors are uncertain if this is the case in the case study office. If collaboration is taking place, it seems to be mainly inside each department, since the collaboration between departments appears to be marginal. Yet this could also change in the future since many employees could only work at the office for a few months.

## 5.5. Discussion

This section will discuss findings and limitations related to the user study.

### 5.5.1. Findings

The user study has proven successful to provide answers to the questions it addressed. These answers have revealed opportunities for a design intervention, but also things to consider when designing the solution.

Regarding the employees' satisfaction with the **social scenario** at the AFO (RQ1), it became apparent from the interviews that the employees are content. The environment at the office is perceived as welcoming and relaxed, and this is thought to facilitate social interaction. The satisfaction with the physical space is high, which could be a factor enhancing social well-being of employees (cf. Keyes, 1998). Of all participants, only one said they were not happy with the scenario and would have preferred more interaction while some stated minor issues that did not harm a generally high satisfaction. In addition, none of the commonly argued problems in AFOs seemed to be present. Thus, there seems to be no obvious downside that the planned intervention could target, yet there is still room to enhance the social scenario.

Despite the positive perception of the situation, there were some interesting insights that were relevant for the design of the intervention. The most relevant one was that even after the relocation, the office is still very divided into departments. The groups tend to sit together because of their work and also have their own work-routines, different from those of their peers. Furthermore, before the relocation each department used to work in their own office, so those employees that were colleagues before moving to the AFO have a greater level of connection among themselves than with people from other departments and old offices.

This led to believe that employees are content with their level of social interaction, which consists mainly in their social silo, and hence they have no need to engage in social conversations with individuals from other departments. Yet, a greater sense of belonging to and identification with the office as a whole could enable greater general social well-being (cf. Kawachi, 2001).

> Therefore, there is an opportunity to enhance the cohesion between colleagues from different departments with an intervention aiming at mixing social silos.

As to the minor barriers stated by the interviewees regarding social interaction, some employees reported having problems to start conversation and a lack of a purpose to meet people outside their department. These statements further stressed the lack of social coherence present, which means that there is an opportunity to enhance social well-being by facilitating interaction across all departments, and even define ways in which it could be achieved by easing off these perceived problems to start conversations.

> Thus, a possible feature of the intervention could be to give a purpose and/or a topic of conversation for people from different departments to meet and talk.

On the same topic, there also seems to be a lack of social activities that involve the whole office. According to the interviews, office-wide activities are almost exclusively parties in relation to holidays, such as Christmas or Midsummer. There seemed to be a wider range of activities which took place more frequently, yet from the employees' statements, there was little awareness about them. Interviewees could not recall whether it was the office, groups of employees or the building´s administration that organized those. The low awareness about these activities could be related to a lack of communication of them taking place, low visibility, and therefore lower participation.

> Thus, there is an opportunity to carry out an office-wide intervention that, by happening at the office and being visible, employees are more aware of.

Pursuing the activities topic further, the interviewees were also asked what kind of intervention they would like. According to the interviews, some employees would be keen on having some kind of game as they thought that games facilitate conversation and would make breaks more enjoyable. Following the same line of thought, interviewees showed a slight preference for spontaneous activities organized by employees, but also looked forward to participating in activities organized by the company.

> The implications are that it would be preferred for the design intervention to be a game, and something that employees can take ownership of and organize or use themselves, but there is also the opportunity to get the company involved with little risk of that having a negative impact in participation.

The major drawback mentioned for the kinds of activities the employees would join were the moment in which the activity takes place. Social activities happening outside working hours had to "compete" with the private life of the employees, while those activities happening during working hours clash with work when the workload is high.

> This would also be a key point to consider when ideating and choosing an intervention.

Finally, as to the **physical space**, there was an overall positive opinion about the office. However, there are a few ways in which the physical space could be improved. The most important one concerns the lounge. Employees seemed confused about the way in which it should be used, and this also leads to some social problems (e.g., it is hard to know if people are working or just talking). It was also mentioned that there was an under-usage of the lounge, which provides an opportunity for a design intervention. There is the possibility to enhance social well-being by re-signifying the lounge and make it a more explicit space to socialize.

> This could be achieved by hosting the design intervention in this space, and by having an explicitly social activity in the room, this could lead to the understanding that the lounge is meant for social activities.

### 5.5.2. Limitations

There are a few considerations that need to be made regarding the user studies. The first one is that interviewees had limited experience with the Activity-based Flexible Office since most had only spent around six months there before the remote work began. This leads authors to believe that some opinions of those shared in the study could change in the future after more experience working in this space. Furthermore, some social dynamics could also evolve with a more prolonged use of the office. This means that if the study was to be repeated after all employees have been working there for, for example over a year, the answers related especially to what barriers and dynamics are present would most certainly be different. This has implications for the final design since it could be the case that its performance would be greater with employees who recently moved to an AFO, compared to those who had a more prolonged experience of it.

Another consideration is that personalities play an important role in perceived social well-being, which highlights the importance of having a representative sample of the office in terms of personalities. It could be that some user groups did not participate and are hence under-represented; while others, more prone to talking about social well-being, were particularly keen on taking part in the study (hence over-represented). Similarly, it could have happened that only those participants with ‘strong’ opinions who wanted to express their satisfaction or discontent towards some aspect of the office took part in the interviews. This was expected by the authors but due to the final wide range of participants and general similarity of answers, it was understood that such polarization did not take place. This led to assuming that the sample was indeed valid.

# 6. Design goals and requirements

This section gathers the key conclusions drawn found from the literature and the user studies in order to clearly describe what the final proposed design should strive to answer.

## 6.1. Aim

The aim of formulating design goals and requirements was to provide a guide for the further work. This guide also served as a benchmark for the evaluation of the ideas proposed and support in the choice the final proposal for the intervention.

## 6.2. Method

The list of goals and requirements was defined based on the findings from user studies and the literature. Both steps of the process contributed to identify opportunities in which a design intervention could enhance social well-being, and to understand the acceptability of different possible solutions.

To define the list of goals that the intervention should focus on, the whole set of opportunities was studied and relationships between them were identified in order to reach the core of the problem. The list was later refined by unifying similar characteristics, and by assessing the importance of each of them. A similar approach was followed to define the requirements.

An example to illustrate the process can be the one with 'accessibility' (see 6.3.2 Requirements and features). 'Accessibility' was defined after identifying connections between other requirements defined in the user studies. The interviews revealed problems regarding the planning and participation in activities, including too many participants to plan for, activities were difficult to organize, shortage of time to take part in some events, etc. All these problems can be understood as different aspects of the same one problem, regarding how easy it is to take part in an activity, including getting it started or to spontaneously join. This way, to facilitate the evaluation of concepts in the ideation phase, terms were grouped into more general concepts.

After defining a list of independent goals and requirements, the importance of each element in the list was assessed. The intention was to guide the design phase by giving priority to those factors that were identified through the user studies as more urgent. With this, three groups of requirements were identified: key requirements, important requirements, and desirable features.

## 6.3. Results

The outcome of this stage was a list of goals that the proposed design should address, and a list of requirements of other important features that relate to the success and quality of the proposal.

### 6.3.1. Goals

Based on the findings from the user studies and literature, the key aspects that could be targeted to enhance social well-being could be:

- Cohesion between social silos: social groups in the office are independent from one another and there is a shortage of office-wide activities. There is an opportunity to bring employees from different departments closer to each other.
- Provide a topic of conversation: the most common barriers to start a conversation are the lack of topic to talk about and the lack of purpose to interact. It is expected that just by providing a topic and a purpose, some people will find it easier to interact with colleagues they do not know that much.
- Bring people closer to each other: through increasing the overall social awareness, the intervention could generate a feeling of a community, which would also enhance the social well-being of employees.

With these goals in consideration, a dream **scenario** was defined to envision what a successful intervention would look like. The scenario was defined as follows:

> *There is a new activity that can be carried out in a relaxed way and is fun to take part in. This activity helps employees know more about their colleagues, ideally at least their name, basics about their life, and some hobbies. The activity is easy to organize and organic: it does not necessarily require any involvement from the company. It helps employees have more social breaks, emphasizing the difference between work and leisure in those moments that are meant to be more social.*

The dream scenario was also defined with desired long-term implications:

> *This activity has led employees to feel closer to each other, generating a higher social awareness. Now the relationship between co-workers is not merely professional, individuals now have a wider social network at work. There is a general sense of community, and the design intervention is still relevant after some time, but it is not needed to sustain the changes that it triggered.*

The dream scenario was used to evaluate the quality of the ideas generated during the ideation phase.

### 6.3.2. Requirements and features

With the intention to make the process of evaluation more methodological, the dream scenario was divided into a list of actionable requirements and features. These different dimensions followed a hierarchy, then being 'key requirements', 'important requirements', and 'desirable features'.

The **key requirements** are those features that are crucial towards achieving the dream scenario. The proposed design must:

- *have the ability to mix people from different departments/silos*
- *have ability to facilitate conversations*
- *have ability to bring people closer together, to create a community*

In addition to these, a set of related requirements were identified for being an important side of the success of the intervention but are not as crucial as the key requirements. These **important requirements** are related to the extent of the intervention, in the sense of how many people are willing to participate, and for how long or how often the intervention can be sustained. There are also two requirements that are related to sub-goals for the creation of a community: ability to promote personal conversations and ability to create common experiences. The proposed design should:

- *be sustainable in the long-term*
- *be appealing (including fun and aesthetics)*
- *have the ability to promote personal conversations*
- *have the ability to create common experiences*
- *allow for inclusiveness: the extent to which different people would feel welcome to take part*
- *allow for accessibility: the extent to which it is easy to join, take part, and leave the intervention*

Finally, two more dimensions which were identified as desirable, but not necessarily important. These are the **desirable features**:

- *The proposed design should allow for that many people can take part at the same time*
- *The proposed design should be identifiable: i.e., it should be easy for employees to see that something new is going on, or that the intervention is ongoing*

Finally, it needs to be considered that there was a characteristic that was overarching to all these dimensions and was 'viability'. Since there is no use to develop a concept design that cannot work or be tested, the intervention had to be viable in general terms, but also possible to prototype. Concepts that are thought unviable should be discarded regardless of how good they could be in theory.

- *The proposed design should be* ***viable****: the idea should be realistic, and it should be possible to develop a prototype to test the concept*

# 7. Ideation

An ideation phase was done after the user studies to generate ideas for the design intervention.

## 7.1. Aim

The aim of the ideation stage was to generate a wide range of ideas of suitable interventions, develop on those concepts, and select the most promising approach as the final design for the intervention.

## 7.2. Method

The ideation had the structure found in Figure 7.

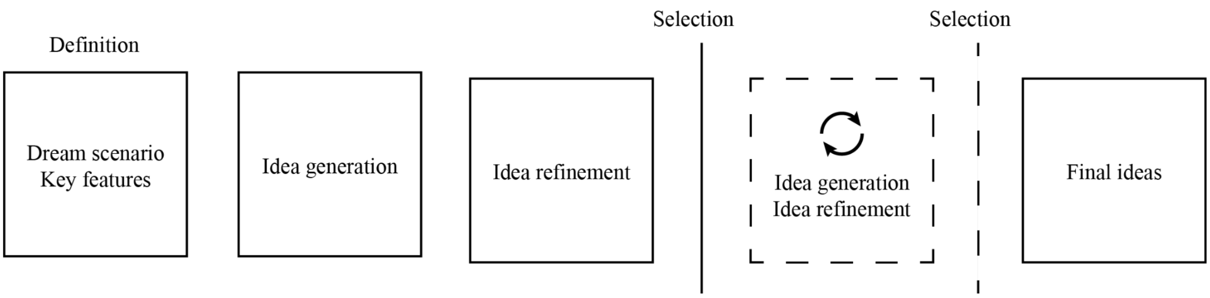



*Figure 7: Ideation process*

The idea generation was tied to the dream scenario and the list of requirements described in “6 Design goals and requirements”. However, the early stages of the ideation prioritized generating a large number of different ideas over their quality. This was achieved through a series of creative ideation methods which brought up a lot of ideas that were discussed later. The main goal in this early stage was to generate as many different ideas as possible to uncover interesting ways to proceed. Early ideas often had the problem of having a narrow scope and focused on a certain side of the dream scenario while disregarding the others. The process of idea generation was iterative, defining further on each promising concept in order to build on its strengths and find a way to mitigate its limitations.

Since only one idea could be validated in the end, it was important to have a way to identify the most promising concepts. After each iteration of idea generation and idea refinement, a selection process was carried out to discard the worse concepts and focus on developing the better ones until there was only one. The process for selecting which concepts to keep and which to abandon is described in more detail in the subsection “7.3 Evaluation”.

In the end, a few approaches showed greater potential and were developed for a larger number of iterations, reaching a fair level of definition. Those promising ideas will be presented and discussed later in “7.4 Considered ideas”, while the chosen concept for the intervention will be discussed right after that in its own section: “7.5 The chosen idea”.

The process of generating ideas had as a starting point the findings from the user interviews. The first step was to try to interpret the findings and understand the reasons for the subprime situation, trying to identify ways in which the scenario could be actioned and improved. For this purpose, two creative methods were used, those were: storytelling, and wishing.

**Storytelling** was used as a means to find the core of the hindrances and dynamics found during the user studies. The authors would play the role of an employee at the space and enact how a normal day looked like, also talking aloud why they did each thing. This method provided a practical way to understand the hidden motivations that shape the social scenario at the office, revealing causes that would otherwise have been difficult to identify. An example of this was the fact that employees from the same department probably have lunch together because they are frequently together in a meeting before lunch, so it is not necessarily a matter of them avoiding their co-workers, could be more related to their work schedules.

**Wishing** was most useful to find the later "desirable features" of the solution, although it served as a trigger to develop ideas as well. This method generates a variety of wishes about the problem, and those can be really crazy or more realistic. This approach revealed desirable and important characteristics for the final concept that were not directly related to problems identified in literature, nor to those aspects revealed during the storytelling.

These two early methods were useful to identify a set of opportunities and characteristics relevant for the final concept. Together with the opportunities identified in the user studies, the design goals and the list of requirements were the starting point to generate the first ideas for design interventions. The initial approach to generate ideas was an unstructured **brainstorming** where the authors aimed to come up with ideas that fulfilled as many requirements as possible. This, however, did not result in a large number of ideas, which was the aim at this point. Alternatively, a more structured approach was used, where solutions were sought for one requirement at a time. This resulted in a much richer variety of proposals, organized by requirement. The next step was to combine ideas from different requirements, to achieve more complete proposals.

After coming up with a set of promising concepts, these different ideas had to be evaluated in order to decide whether to develop them further or to discard them. A protocol was designed to perform that evaluation in a methodological way. The way in which ideas were selected is described in the next section: "7.3 Evaluation".

## 7.3. Evaluation

The evaluation process had the goal to identify which ideas were more promising and which were more limited with the intention to develop further only the ideas that had a greater chance to become successful interventions. The evaluation used the list of requirements described in "6 Design goals and requirements" to assess the potential of each concept.

The evaluation of ideas was performed after each iteration and consisted of assessing the potential of each concept to fulfil each requirement. To avoid subjective biases, the authors aimed to keep an open mind and also consider the uncertainty in each iteration before grading the potential. This way, the authors only highlighted the sides in which each idea was clearly strong or weak, after all reasonable doubt. When it was not clear if an idea would achieve a positive result for a given requirement or not, that dimension was considered neutral and not used to compare concepts until further iterations when ideas could be more defined, and the uncertainty would be lower.

At this point, it was known for each concept what the strengths were, and what limitations they presented. After considering the hierarchy of requirements, it was possible to assess which concepts had an overall superior potential and which had important shortcomings. Those concepts that showed intrinsic limitations or those concepts that were overall weak were abandoned. This process was repeated until only one idea was left. The matrix used for the evaluation is shown in “Figure 8” (below).

| | | | Concepts | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Idea 1 | Idea 2 | Idea 3 | Idea 4 | Idea 5 | Idea 7 | |
| | **Requirements** | **Importance** | 5 | -5 | 3 | -3 | 9 | 0 | +/- |
| 1 | Mix silos | 5 | + | - | | | + | | |
| 2 | Facilitate conversations | 5 | | | | | + | | |
| 3 | Closer community | 5 | | | | | | | |
| 4 | Sustainable over time | 3 | | | + | - | - | | |
| 5 | Appealingness | 3 | | | | | | | |
| 6 | More personal conversations | 3 | | | | | + | | |
| 7 | Create common experiences | 3 | | | | | | | |
| 8 | Inclusiveness | 3 | | | | | - | | |
| 9 | Accessibility | 3 | | | | | | | |
| 10 | Identifiable | 1 | | | | | + | | |
| 11 | Many can take part at the same time | 1 | | | | | + | | |
| 12 | Viability | 0 | | | | | | - | |

*Figure 8: Example of an evaluation matrix*

As seen in the table, the characteristics of each idea were evaluated as either strong (+), weak (-) or neutral (empty). For the cases in which the product did not excel in any direction, or it could not be known for sure how it would turn out, “neutral” was used. Being strong or weak in different aspects was also considered in concordance with the importance of the requirement, as described in “6 Design goals and requirements”. Finally, ‘viability’ was considered as one of the most important requirements and thus, not being viable was a sufficient reason to discard the concept.

## 7.4. Considered ideas

A number of non-final solutions that were developed to a certain extent is commented on in this section. Each idea is briefly described, with an explanation of their strengths and thus why they were considered, and the weaknesses that ultimately lead to discarding them. Ideas are presented grouped according to three kinds of approaches: games, atypical objects and collaborative creativity (Figure 9).

*Games* *Atypical objects* *Collaborative creativity*

*Figure 9: The three kinds of approaches*

### 7.4.1. Games

Games was the group most commented and considered, because of the natural and fun environment they create. Games in general are outstanding in some of the dimensions of the evaluation: they have the potential to mix people from different departments, are appealing, and could promote a sense of community. They also have the potential to become a habit if the proposal can be sustained, and thus the impact of the intervention is prolonged and self-sustained over time.

Some ideas within *games* were the following.

**Games in teams.** In addition to the general benefits described games in which there are teams enable conversations about non-work-related topics. The conversation is also sustained by the game itself given that it provides a topic and a purpose for social interaction, hence addressing two hindrances identified in the user studies.

At the point of greatest definition, the preferred idea with *games in teams* was to develop a board game with a big central element to call the attention during breaks and allowing “drop-in, drop out” for maximum accessibility. To ensure sustainability over time, the idea was to promote playing the game periodically, at a fixed time, hence hopefully creating a habit. Alternatively, quizzes and office sport competitions were also considered as similar approaches in almost every way.

However, these ideas shared some major drawbacks that lead to discarding them, viability being the main obstacle. At the time, having to conceive a whole game and its rules and dynamics was not viable with the available resources. It also raised concerns for its sustainability over time (considering games need planning, guiding, and probably storing of material), and regarding inclusiveness (e.g., can people be left aside because too many people are already playing?). In most cases, accessibility would also be an issue since the game would likely be played at a certain time on certain dates, thus employees would not be able to drop-in and leave at will.

All things considered; *team games* were an overall very promising concept. The main reason why the idea was dismissed was that the viability to design such a game was questioned, and the time it would take the authors to come up with and prototype it. (Totem offered a similar or superior outcome in a more time-efficient way.)

**Low-key games.** This idea differed from the previous one in the fact that the games work more as probes, left at the office for people to interact with, but with no major involvement behind it. The idea began giving priority to making the activity accessible compared to what quizzes and competitions could offer.

The approach with low-key games was not to actively promote engaging in conversations, but rather to offer an organic bottom-up activity that could be used as a topic of conversation and meeting point, on top of all the benefits from games. Some already existing games used as inspiration were Jenga and puzzles. Compared to *games in teams*, *low-key games* offered much higher viability and accessibility at the cost of lower control over who plays it. That translates into less certainty that the intervention will help different social silos to mix. Furthermore, it is arguably weaker in terms of facilitating conversations and promoting a closer community than the *games in teams*. Additional aspects of concern were that these small games could promote territoriality and be used to reinforce silos. Because of these limitations and that the authors would not have to design anything for the validation, *low-key games* ideas were abandoned.

### 7.4.2. A-typical objects

A completely different alternative that was pondered was to place objects which would catch the attention of employees because of their peculiarity. Employees would wonder what the object is, where it comes from, or what it does, hopefully leading to conversations with colleagues. On the one hand, as positive attributes, these kinds of proposals are eye-catching and could generate conversations. On the other hand, their downside would be that they neither actively promote conversations, nor enable a more social culture, or create a habit. Moreover, it is hard to sustain in time since it requires planning and probably even crafting. From the environmental perspective, it would also raise questions since it would involve buying items that would be later thrown away. This idea was abandoned given that other approaches were found much more promising.

### 7.4.3. Collaborative creativity

The final approach was *collaborative creativity*. The idea behind this was to promote self-expression with the hope that this would lead to an office-wide discussion of non-work-related topics, hence increasing social awareness (especially about non-work-related topics) and hence leading to a closer community. Furthermore, the process of creating an art piece would promote a suitable atmosphere for conversations.

**Construction games.** Construction games could be placed on tables in less used areas. It could be left there with no further instructions, or with some prompts like “build the tallest structure” or “build the coolest town”. This would enable a very accessible activity for anyone to join as little or as much time as one wanted. It provides also an environment where one has an aim and is comfortable, where natural conversations could arise, and it could become a habit. However, these features are not ensured, and they could as likely not happen. What they do have is the potential to create common experiences and bring people closer to each other through collaboration. Yet, some people might never be appealed by it, it does not necessarily mix people from different silos, it might even create territoriality the similar way that *low-key games* could, and the number of conversations that could arise could be scarce too. While it is acknowledged that these limitations could have been eased-off with further work on them (*Totem* and *Games in Teams* looked more promising) and was thus abandoned.

**Workshops**. As a way to promote knowledge sharing, to bring closer colleagues, and to learn things about the personal life of each other, the idea to arrange workshops with the people at the office emerged. The idea was backed by the Maker-space that was available on the ground floor of the same building where the office was. Periodically there could be workshops of various themes, such as wood carving, recycling textiles or ceramics. Workshops could be led by either employees themselves or professionals. This idea was one of the most promising in the earlier stages of the ideation since it was perceived as the one with greatest potential to achieve the dream scenario.


*Figure 10: Creating something together could be a solution.*

Another variation on this idea was to have *hackathons* to solve a certain problem. The idea is to get hands-on with something practical, to learn, teach and help each other to create a different kind of bond. This is also facilitated by the environment change, being outside working hours at a place that is not the flexible office. The results could also be part of an exhibition at the office.

The advantages of these kinds of ideas are that it is easy to mix people from different departments, enables common experiences, conversations not related to work, and make people closer to each other similarly to how it happened in *construction games*. The disadvantages are that it is not necessarily appealing for everyone, it would be the least accessible of all ideas since they should happen after working hours and on fixed dates and times, and it requires planning and organization for it to happen periodically, which questions its sustainability over time. Finally, it was important to point out that given the Covid'19 situation, this could have not been tested. Viability and sustainability were major problems that could not be solved, which led to the idea being discarded.

Leaving **sticky notes** around the office with no prompt or suggestion was another idea. It was expected that few conversations or games would emerge. Employees could write down how they are feeling and leave it in meeting rooms, then maybe the next one could reply with a funny drawing or similar. This idea aims to enhance social awareness and maybe bring people closer in a playful way. The positive aspects would be that it enables customization of the space, is very accessible, could become a habit, and increases social awareness. The downsides are that it is not necessarily appealing to engage, does not create conversations per se, does not mix silos, and how it might be used and what can turn out from it is impossible to predict.

## 7.5. The chosen idea

The chosen idea is Totem, a product for self-expression that is customized through conversations with colleagues. In addition to the product, an experience would be defined where Totem would be a mediating tool. It appeared after searching for solutions to the main limitations of *games in teams* and *construction games*, when the authors realized that the combination of both in a single, gamified, creative experience would keep their respective strengths and reduce their limitations. The idea was selected after it remained as the only promising and viable concept after the evaluation phase. The results of the last evaluation stage are shown in Figure 11.

| | | | Concepts | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Games in teams | Low-key games | Atypical objects | Construction games | Workshops | Sticky notes | Totem | |
| | **Requirements** | **Importance** | 20 | 4 | -12 | 13 | 13 | -7 | 25 | +/- |
| 1 | Mix silos | 5 | + | - | - | | + | - | + | |
| 2 | Facilitate conversations | 5 | + | | | | + | | + | |
| 3 | Closer community | 5 | + | | - | + | + | - | + | |
| 4 | Sustainable over time | 3 | | + | - | | - | + | | |
| 5 | Appealingness | 3 | + | + | | | | | + | |
| 6 | More personal conversations | 3 | | | - | | + | | + | |
| 7 | Create common experiences | 3 | + | + | | + | + | - | + | |
| 8 | Inclusiveness | 3 | - | - | | | - | | | |
| 9 | Accessibility | 3 | | + | + | + | - | + | | |
| 10 | Identifiable | 1 | + | + | + | + | | | | |
| 11 | Many can take part at the same time | 1 | + | - | | + | + | | + | |
| 12 | Viability | 0 | - | | - | | - | | | |

*Figure 11: Final evaluation*

On a conceptual level, the chosen idea is a pendant customized with beads that the participants would wear visibly (Figure 12) (below). What makes this idea work as an enabler of conversations is that participants are expected to award tokens to each other. Each bead would have a prompt indicating to whom it should be handed out, for example, “someone that helped you recently” or “someone that is funny”.

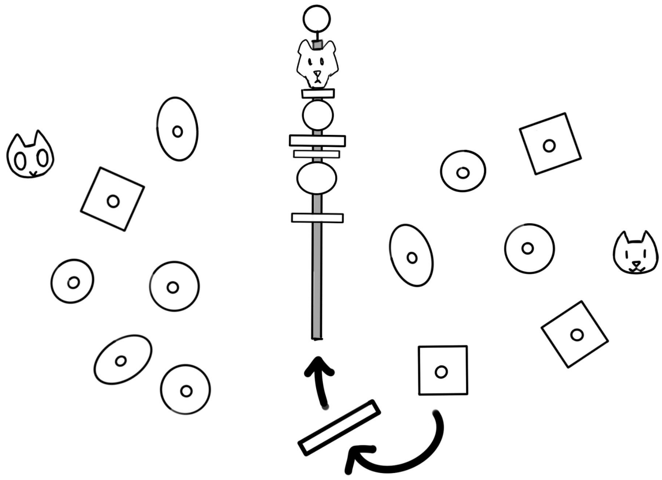


*Figure 12: The Totem concept*

This idea quickly stood out from the other ones since it had the potential to accomplish the key and desirable aspects used as criteria for selection. The experience could create **conversations** about non-work-related topics and hence increase social awareness about them. Greater interaction and awareness about personal life is thought to lead to a greater sense of community. It could also be a **low-involvement activity** that people can drop-in and out of whenever they want and also ensures the right to opt out. The product can be done appealing, with the added benefit of allowing self-expression and reminding of common experiences, if not to create the experiences as well. Furthermore, it was considered very viable to develop a prototype with these characteristics.

The experience itself can also be held periodically in order to promote the creation of a **habit.** It is expected that by introducing an explicitly social activity, culture can be transformed and communicated better. Furthermore, many people can take part at the same time, hence also mixing silos. It is also an **inclusive activity**, since anybody can feel appealed by the concept, and participants can take part to whichever extent they feel comfortable with.

To sum up, this idea has the potential to check all the dimensions in the evaluation, while having no major limitation regarding any of them. It was because of that that the Totem was selected as the final idea and thus further developed to the final design, then prototyped and finally validated.

After the selection of this final idea, it was carefully developed further to its final concept. Both the experience and the physical product had to be defined further. Some aspects that required more development were features such as how frequently the Totem experience should happen, which should the meanings of the beads be, how should the exchange of the beads take place; these questions are though more related to the prototype than the final concept. For this reason, the explanation of the key aspects of the Totem Experience will be discussed in the next chapter: "8 Final Concept". Decisions that were more related to the prototype than the concept itself are explained in the section "9 Prototyping the product and the experience".

# 8. Final Concept

The Totem Experience is a design intervention to enhance the social scenario at the office. It aims to actively create non-work-related conversations between colleagues who do not necessarily interact often otherwise. The intervention achieves the three key requirements: mixing silos, facilitating conversations and ability to create a community, by providing a space and a time for social interaction in which people from all departments can meet, and by even out the main barriers to social interaction by giving a purpose and a topic to start conversations. By providing tools to learn new personal things about new colleagues, it is assumed that the Totem Experience can enhance the social integration aspect of social awareness, this way promoting a closer community at the workspace as well.

As can be understood from this definition, the core of the intervention is the experience itself. However, to sustain that desired interaction it is necessary to use a mediating tool. In the case of the final concept, the mediating tool are *tokens*: small shapes that represent meanings like hobbies and personal traits, that are awarded between colleagues as a way to acknowledge the personal characteristics of each employee.

The *Totem* is a pendant that holds and displays the received tokens (Figure 13). The Totem can also support conversations as colleagues can discuss each other's pendants, but its main benefit is to provide a way of self-expression, enabling employees to visually share their personalities in an office type that restricts customization. The design was inspired by Canadian native Americans' totems, once used as sculptures to represent the strengths and personality of different tribes.

*Figure 13. A Totem full of tokens*

To summarize, the final concept consists of three pillars: an experience, a mediating tool (tokens), and a customizable product that is the outcome of the intervention (Totem). More about each part of the solution is discussed in the following sections.

## 8.1. The experience

The experience is the core of the intervention, it is through the experience that the Totem Experience can achieve its goals. As introduced before, the experience aims to reduce the barriers to social interaction, and to provide a time and space where and when it is encouraged to meet new colleagues and discuss non-work-related matters.

The Totem Experience creates a favourable environment for such an exchange through the use of tokens, which act as the mediating tool. The process of the experience is as follows. The intervention consists of several sessions that are carried out periodically. The times and dates in which these should take place will depend on each office, but what is important is that it happens periodically. It is expected that by repeating the experience, the office will adopt the behaviour of getting together and talk about non-work-related matters even after the experience is over, and thus the benefits from the intervention can remain and be self-sustained after it is finished.

Each of the sessions should be assigned a date and a time, and employees at the office should be aware of the event since this facilitates the mixing of social silos. By gathering the whole office in the same place with the same goal, barriers to social interaction are eliminated and meeting colleagues outside the department is facilitated.

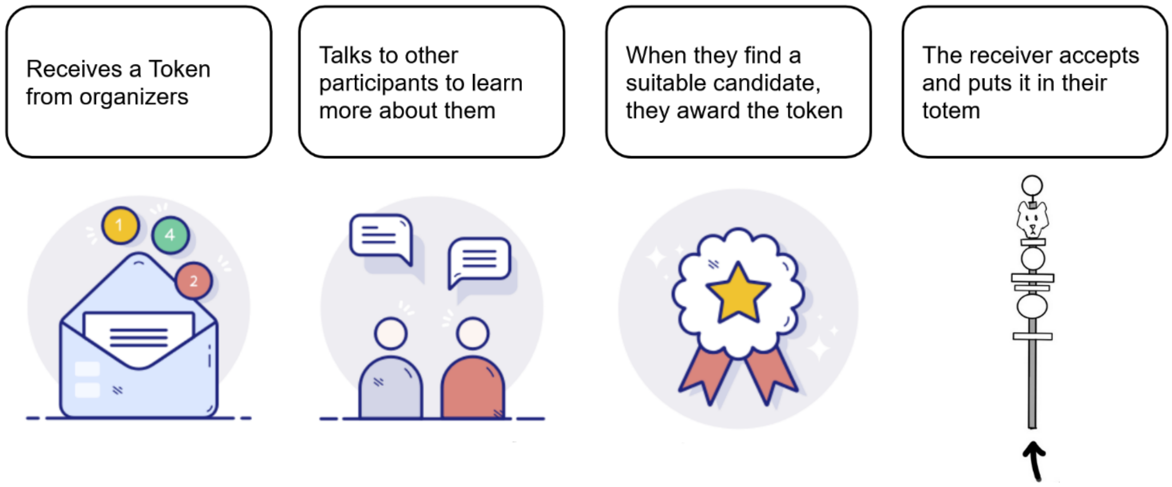



*Figure 14. Stages of the experience*

The protocol of the experience follows the stages shown in Figure 14. At the beginning of each session, all participants get together in a common room, and each of them receives a number of tokens together with a description of their meanings. After this, participants should find the colleague at the office who is best described by the tokens. For example, if a participant has the token for ‘friendly’, they should find the friendliest person at the office, not just someone who passes the requirements.

Tokens are the key element that sustains the experience. Tokens are implicit questions to employees, asking them if they know someone who has a certain hobby or personality trait. Even if participants think they know each other very well, tokens will eventually reveal a gap in social awareness that can only be resolved through non-work-related conversations with colleagues, both those that they know well, and those with whom they do not interact often. Thus, tokens evidence a shortcoming in social awareness, nudges people into talking to each other, and gives the “excuse” to have those conversations.

Moving on with the stages of the experience, participants now have a token and must find who they should award it to. It is important that all participants of a same session receive the tokens at the same time since then they are all at the same place and at the same time with the same goal, thus reducing the limitations to engage in social interaction. This stage of the session is un-planned, organic conversations between employees, where they will try to find a suitable candidate to award their tokens.

It is not defined what the time limit to award tokens should be, or if there should be one. However, as time passes, participants will likely talk to more colleagues and find the appropriate individual to whom they will award their token. The awarder hands the token to the receiver explaining why they should have it, and the receiver would then accept it, and put it in their own Totem. Through this action of acknowledging those aspects that make each person different, and by recognizing their excellence in a specific field, it is assumed that the intervention will promote a culture of recognition that will bring people closer to each other.

As the sessions take place, participants will progressively fill their Totems and learn new things about each other. The increased awareness about each other's personalities enables new dynamics between employees, they can now discuss new topics, make new plans for social activities, create 'clubs' with people with common interests, etc. In other words, by enhancing social awareness, the Totem Experience enables a set of new dynamics that enhance social well-being, even after the intervention is finished. It also promotes a more cohesive office, since there is more opportunities to meet people from other departments.

## 8.2. The tokens

The tokens are what encourages and facilitates social interaction at the office. As mentioned before, they are small beads, designed to fit the pendant. Tokens symbolize a meaning, and thus should be designed to represent the characteristic they *"protect"*. This is also a key feature since it is assumed to favour recognition, but also to be related to the emotional response in users. It is assumed that if tokens transmit emotions that resonate with the owner's personality, this could have a positive impact on the experience of the product as a whole and promote positive reactions such as emotional attachment to the Totem.

Tokens also need to be designed in a way in which shape and colours are coherent with the meanings they "protect", in order to be recognizable. Yet, communicating meanings through shapes and materials can be difficult to accomplish, particularly for abstract concepts. To make sure every participant can identify any token at any given time, there is a database with images of all existing tokens, their meanings and descriptions. This information can also be used by the participants when they are seeking who to give their tokens to.

*Figure 15. Tokens*

Another important consideration about tokens is the range of meanings that they cover as a whole. The diversity of meanings available can be observed in Figure 15. The main reason behind the making of such a variety of meanings is that with a wider range of meanings it is more likely that participants can be differentiated from each other, and also be better described by their Totems. In other words, with a broader range of meanings Totems can better capture the particularities that make each individual unique. Also backing up this decision, it was considered that meanings that apply to fewer people are more interesting to discuss since they can bring up sides of the participants that others did not know about. For example, learning that a co-worker used to be a hockey player will in some cases be more amusing to discuss and more revealing about colleagues than knowing that they like to read.

At the same time, other benefits are expected from more generic meanings. Since they apply to a larger group of people, it is more likely that one will find someone to discuss its meaning with, and it can generate further action beyond the conversation. For example, with the case of reading, after knowing that a group of people like reading, they might start sharing recommendations more actively, or even using a shelf at the office to exchange books. Generic tokens also have an extra benefit: being more common, they are also more accessible topics for discussions. Taking into account that some individuals might not be that open to share their interests and hobbies, generic meanings will also mix in the conversation these less open profiles, hence building towards inclusiveness. The advantages and downsides of both types of meanings are summarized in Figure 16.


*Figure 16: Characteristics of meanings*

It is important to point out that only positive personal characteristics will be used for the tokens. This is motivated by the desire to ensure acceptance of the product-experience and a good environment, its reason being that avoiding possible negative connotations to the act of awarding a token will also avoid the risk of people opting out of the experience.

Lastly, it was considered that the wide range of tokens varying from “generic” to “specific” only makes sense with a limited number of tokens for each meaning. As mentioned before, the intention is to make each token valuable in the sense that if you have received it, it is because it truly describes you. It was considered that an unlimited number of copies for each meaning would diminish the value of the tokens. In addition, with an unlimited supply, the generic ones would fall in the hands of both popular and less popular colleagues, while the specific would likely only reach the more popular colleagues, hence creating a division.

In conclusion, both generic and specific tokens have their benefits and limitations, and they work together for the best scenario, making the activity inclusive while also leaving the door open for more specific conversations. Providing tokens that represent all positions in the Generic-Specific continuum should hence have a positive impact on the overall perception of the experience. Testing user´s perceptions and preferences of tokens will be an aspect to research during the intervention.

## 8.3. The Totem

The Totem (Figure 17) is the final product that results from the intervention. After enough sessions, participants will have collected enough tokens to fill their pendant and, thus, the experience will finish. The completed Totems will thereon become a symbol of the office since it is the product of a common experience, and also has the goal to provide a way to self-expression for employees at AFOs. For this, the design is such that it encourages the display in the employee´s lanyard. (At the office of study, employees had to wear their ID somewhere visible, and many choose to use a lanyard and hang it from the neck. Taking advantage of this opportunity, the Totem is designed to be hung together with the ID.) This also calls for the product to be lightweight and comfortable to wear.

Other than being lightweight, the length of the Totem also affects how comfortable it is to wear. At the same time, the length of the product limits how many tokens it can fit, thus, deciding on the length of the product also affects how much employees can communicate about themselves. This might be seen as a limitation of the design, but it is an opportunity to elaborate on what was said before and make each token count. With a limited capacity for tokens, participants should prioritize those tokens that best communicate the characteristics of their co-workers.

*Figure 17: Example of variation within Totems*

The limited capacity can also favour the inclusiveness of employees in the experience. One thing that is difficult to avoid is that those employees that are the most outgoing and social will get more tokens, while introverts will likely get fewer. With an intrinsic maximum number of tokens per Totem, the experience organically restricts how many meanings each participant can obtain. In consequence, as the experience progresses, some Totems will be filled, and the new tokens given out can only reach those individuals with space for them. In the end, the number of tokens received by participants would even out naturally. This way every participant will take part in the experience to a similar extent, reducing the risk of anyone feeling left aside.

Finally, it is unclear if the Totem is self-sufficient to extend the dynamics of the intervention on its own, but it is assumed that it can work as a way to remind of the experience, and thus as a facilitating tool even after the experience is over.

# 9. Prototyping the product and the experience

This chapter describes the prototyping of the product and the experience to be validated. The different steps of the prototyping stage will be discussed in depth in the following subsections: Planning, Crafting the tools, Final prototype.

## 9.1. Aim

The aim of the prototyping phase was to design the experience and to craft the physical tools for the validation. The prototype should help answer a set of questions used to validate the idea in the *Validation* stage.

The complete list of questions for the validation is provided in the "

Validation" section. However, it is worth noting that some of those questions could only be tested thanks to decisions made during the prototyping stage. Those questions are shown below:

- Are some meanings of tokens better than others to create conversation?
- Are some meanings better than others to learn new insights from colleagues?
- Are some tokens more fun than others to discuss?
- Does the experience ensure that people from different silos will meet?
- Is the experience accessible and inclusive?

## 9.2. Planning

The planning phase had the goal of making technical and formal decisions to make a working prototype of the design concept. Two main elements needed to be defined: the physical product and the experience.

### 9.2.1. Physical product

Planning the physical product involved both the structure of the Totem and the tokens, yet most of the early planning focused on the physical product, especially on tokens. Due to their role in the experience, tokens required careful planning of two different aspects: meanings and shape.

The first step in developing the prototypes was to **define different types of tokens**. Two main categories of meanings were developed to generate a more personal type of conversation with a wide range of topics, as well as a culture of appreciation. Personality traits would promote the generation of a culture of appreciation through only positive meanings; and hobbies could trigger a more personal conversation through interesting anecdotes. The combination of both, yet especially through hobbies, is expected to enhance social awareness.

It is worth mentioning that there are different levels of rarity. In other words, tokens vary from very specific to very general (e.g., *was in a 'dansband'* to *likes 'fika'*) to provide an option for those willing to share more about themselves to do so, but also to ensure that those who do not can also participate with the "lightweight" tokens. It is also expected that specific tokens can be more fun to discuss, but also more difficult to hand out. In consequence, a balance was sought.

In addition to personal characteristics, there were four special tokens that were slightly different. These tokens were called *would-be:s*, and, as the name implies, they aimed at finding who at the office that would be something in particular. Some early ideas were "who would be a great TV presenter" or "who would be more likely to survive in the wild". The goal with these tokens was to create a unique debate about a topic between all participants, as opposed to the other tokens, that promote multiple simultaneous conversations with smaller groups. Another difference with the "would be" tokens is that they are awarded after the agreement of all participants. It is more of a democratic choice: everybody gets a say, and everybody gets a vote. It could be a way to integrate everybody in the conversation (thus better at creating a community than regular knots), or the opposite, and become an award for those employees that are more popular. This will be something interesting to test during the validation.

These tokens (later called *Knots* because of the shape they were given) could also promote a different type of conversation. Since they are awarded based on assumptions and not on facts, the conversation could be more hypothetical and hence on different topics. The conversation becomes more explorative, and people can share things that would otherwise not be known, for example, if the debate is "who would be a great TV presenter" people might bring up past experiences in television or how they love talking to an audience. *Would-be:s* propose a more organic conversation that is less controlled by the authors.

The **preliminary list of traits** was inspired by personality tests online, cards to start conversations, and even games that define personality characteristics. The list itself was brainstormed, defining hobbies and personality traits that would suit the experience. A key aspect of this brainstorming was that all of them were expressed in a neutral or positive way, to avoid any kind of negative feelings being associated with them. This first list featured around 80 different meanings.

This early list of characteristics was tested to find out to which extent people would feel described by the list of meanings. In other words, a quick study was performed to see to which extent different people felt appealed by the meanings. A group of 13 individuals, ranging 22-56 years old, were individually asked to highlight those meanings in the complete list that they felt more closely related to. The results helped the authors to refine the list, but also to decide on a token limit for the Totem. As mentioned in previous sections, it is important that every token is valuable and that can only be achieved through limited capacity in the Totem. After testing the preliminary list of meanings, it was noted that most participants only selected between five and seven tokens. Finally, the limit of tokens that should fit in a Totem was set to seven to give some more room for self-expression.

Another important consideration was the available number of different tokens during the experience. The preliminary idea for the experience was to invite up to 20 people to the study, giving priority to those that took part in the interviews. In order to fill the Totems of 20 participants, around 140 tokens would be needed. It was noted that most of the 80 meanings defined previously could easily appeal to more than one participant (e.g., 'likes *fika'*), hence it was decided to have two tokens of each meaning, adding up to 160 tokens, enough to cover the best scenario with 20 participants. However, after finishing all tokens, it was considered that there was a fair number of tokens that would likely be challenging to hand out. Thus, it was decided to make a few more copies of common one (hobbies) just to be sure that participants would not be unable to fill their Totem despite there being tokens to spare.

After the list was developed, **assembly and manufacturability** were assessed; How to make a lightweight structure that would be easy to open and close each time a token was received, and which would hang from the ID card. Considering that participants would place a new token in their Totem at least seven times during the experience, it was crucial that the solution was quick to open and close, and also secure so it is never opened by accident, causing the tokens to fall.

Many ideas were considered for the fabrication; however, the preferred options were unviable due to lack of resources. For example, Figure 18 a threaded rod and a nut, as well as a sliding pin at the bottom of the rod can be seen as suggestions considered for fastening and support for the Totem.

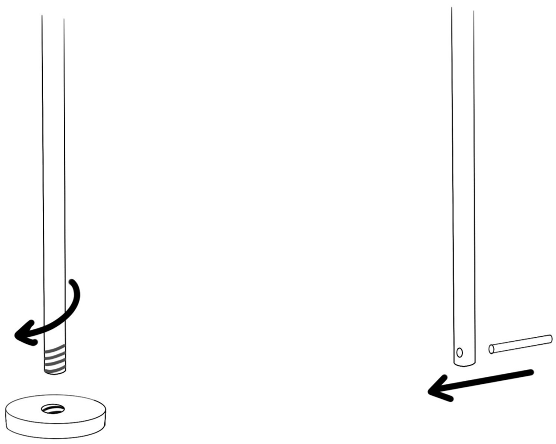


*Figure 18: Closings considered*

In the end, the viable choice was between two alternatives: to use a leather strip with a rubber band at the bottom to prevent tokens from falling, or a wooden rod with a magnet fastener. In both cases, the top part was expected to be solved with standard jewellery ringed clamps.

As to the tokens, the requirements were mainly a lightweight and versatile material, with which multiple variations of tokens could be easily manufactured. Early ideas involved laser cutting wooden 2D animals to better resemble the concept of a Totem. However, due to the limitations of only using animals and being unable to trust that the cut-outs would be on time for the experience, the idea was discarded. Alternatively, the thought was to use polymer clay that would enable the authors to do their own designs, have more variety of shapes and colours for different tokens, and also have greater control over the schedule.

### 9.2.2. Experience

Aside from the physical tools, it was also needed to plan the experience. While there was a general idea about how to carry out the experience, there were still many aspects to be defined such as how the tokens would be handed out, how the experience should be explained, how ensure that people chatted about the tokens or how the environment could be altered to facilitate the conversation.

It should be highlighted that the **original idea** was to carry out the experience on-site at the office. Since there were enough employees working at the office to have a face-to-face validation experience, most of the planning of the whole protocol was done in that direction. The aim was to have a display product that also explained the basics of the activity.


*Figure 19: Tepee, first model*

The original idea was to have a tepee with some tokens inside, a full Totem, and by its side, a panel with instructions. The tepee would call the attention of people coming into the office, and hopefully trigger them to read about the experience. An image of the concept of use of the tepee can be seen in Figure 19.

As to the protocol, the original idea was to hand out two random tokens per person and hand them all out at the same time. This would ensure that all the participants are in the same room at the same time when they receive the beads, thus making it easier to start chatting. The instructions to the activity would be both on the information board by the tepee and online, but there could have been a short introduction at the beginning of the session if needed.

The experience was planned and ready to be carried out, when the authors were told at a meeting with the company that the experience could not happen on-site given that the company could not promote any kind of social activity that would require people meeting in groups. This turn of events, while perfectly reasonable, was unexpected because it had always been clearly stated that the project aimed at enhancing face-to-face interactions. In any case, there were two alternatives considered: to postpone the final validation experience until the pandemic allowed gatherings again, or to carry out the experience digitally. The only certain course of action was to carry out the experience digitally since it was unclear at the time of the decision when gatherings would be safe again.

The next step was then **planning the online experience**. It was decided to perform the activity via video call and to divide participants in smaller break-out rooms in order to be able to sustain a fluent conversation that involved every participant. To ensure that it is possible to have a fluent conversation with all members of the same group, the size of the group was capped at five participants. If there were six participants or more, two groups of three would be made, and so on. As to the tokens, instead of giving two random tokens per person, a group of tokens would be assigned to a break-out room for participants to discuss and award them between the members. In this scenario, instead of a physical token, the participants would receive a picture and a description of their group´s tokens. This means that each break-out room would receive a file with the pictures and descriptions of all the tokens they should discuss (e.g., if there are four participants, they would all have the same file with the same eight tokens). The files would be prepared before the sessions. The tokens that each group would receive would still be set randomly.

The overall activity would look as follows: first a short introduction and icebreaker, then participants would be divided into groups, sent to the breakout rooms and given access to their tokens. There would be a short unsupervised discussion in groups, and at the end the participants would meet the authors back at the main session to inform which token was awarded to whom, and then talk about how things went.

Finally, since the tokens and the Totems had already been crafted, it was decided to hand the tokens that each participant had received to them as gratitude for their participation. This was also used during the promotion and presentation of the experience, to encourage the participants to "really look for someone fit for each meaning" and avoid them taking the exercise too lightly.

## 9.3. Crafting the tools

Following the planning, the next step was to craft the physical tools to be used during the experience. The goal with crafting the tools was to generate the physical prototype needed to support the experience, mainly the tokens and the Totem, but also other supporting material such as the catalogue or the tepee.

As to the **creation of the tokens**, the first step was to get acquainted with the material, since none of the authors were experts with it. The early stage was useful to explore different techniques and styles that inspired the final designs. The authors went through the list of meanings trying to identify which shapes, techniques and colours could generate a similar emotion to the one of the meaning of the token. For the more abstract meanings, the design tried to evocate the feeling of the meaning through the instrumental sensory information that would be perceived by the users. For example, brighter colours were used for more energetic activities, rounder shapes for more abstract concepts, marble stone-like patterns for more relaxed concepts, and so on. For meanings that referred to hobbies, a more figurative approach was adopted. When possible, the figurative approach was carried out together with the same design principles explained before aiming to also transmit an emotion associated with the activity. This way, "magician" adopts the shape of a top hat and the dark colours with bright sparkles try to transmit a feeling of mystery and surprise, while "baking" is a cute, round muffin that aims to emulate the warmth and care typically associated with this activity.

Once a shape was conceived for each token, two copies were made. In other words, there are two identical tokens for each meaning. The unbaked polymer beads were then punctured and put in the oven for the polymer to "dry" and become hard. The result was over 160 tokens. Considering that each of the 20 totems would fit around seven tokens, the quantity was more than enough for all participants to fill their pendants. The whole collection of tokens is shown in Figure 20.

*Figure 20: Collection of tokens*

As to the **support for the totem**, previously it was considered to either use strips of leather or wooden sticks. In the beginning, leather strips were favoured because their flexibility made the Totems more comfortable to wear, and also because it was thought to look better. However, leather strips had a problem: it was difficult to get their diameter right when making the tokens, which would lead to some tokens not fitting. It was at this point that the leather strips were changed for the wooden sticks. Accessibility to wooden sticks of a certain diameter was guaranteed. Hence, it would be possible to create tokens of the right diameter and also have enough sticks to make 20 Totems. Wood also turned out to be a better solution for the hanger clamp. Clamping the hanger was not solid enough, contact glue was needed to secure the joint. The final prototype for the physical product is shown in Figure 21.

*Figure 21: Final physical prototype*

The **tepee** was, as mentioned earlier, crafted for promotional purposes. The idea was to use the tepee as an eye-catcher for people to read about the activity in a supporting poster, or to remind people of the activity. It was discussed whether to use it as some kind of "Christmas tree" and place the tokens for each session inside. After switching to an online experience, the tepee was not needed and was only used to create promotional pictures used in the catalogue and other posters. A picture of the tepee used for promotion can be seen below Figure 22.

*Figure 22: Final tepee*

The **catalogue** was designed to help participants remember what the tokens they received mean, should it be necessary. The catalogue was a necessity when the activity was to be carried out in person, but it became completely crucial after the switch to the online platforms. Since people would not see the tokens they were to talk about, it was necessary to make a database that showed all the different tokens and a brief description of their respective meaning. It would also be the only touchpoint between authors and employees to explain the experience before the experience.

The catalogue, a pdf file, was designed with software for graphic design. To put together the document information that would be displayed (e.g., instructions for the experience, descriptions of tokens), and visual support, including the pictures of the tokens, had to be produced. Each pair of tokens was photographed against a homemade, white backdrop. The goal with the pictures was that they described in a neutral way how each token looked since participants would not be able to feel them by themselves during the experience. Screenshots of the catalogue are shown in Figure 23. A link to the catalogue can be found in “Appendix: Tokens catalogue”.


*Figure 23: Catalogue*

# 10. Validation

This section elaborates on the aim, method, and results from the validation stage.

## 10.1. Aim

A validation study was performed to assess the strengths and limitations of the prototype experience. Through the validation it was intended to answer the following research question:

- *How can the social well-being at an AFO be enhanced through a design intervention? (RQ3)*

The validation was intended to answer some more questions regarding the final solution and the prototype. Those questions are listed below:

- *Do tokens facilitate conversations? What can be improved?*
- *Do tokens enable more personal-related and less work-centred conversations?*
- *Does the experience suit the conversation? What can be improved?*
- *Is the intervention useful to meet people outside current silos?*
- *Does the intervention increase social awareness?*
- *Does the intervention make it easier for participants to start conversations in the future?*
- *Does the intervention make colleagues closer to each other?*
- *Are Totems relatable? (Do participants feel described by their Totems?)*
- *Do Totems create a sense of belonging?*
- *What do people think of the product?*
- *What do people think of the experience?*
- *Overall, is it an intervention that people enjoy?*
- *How did the digital medium influence the conversation?*
- *Do perceptions about the intervention change over time, (after 1+ participation)*
- *Are some meanings of tokens better than others to create conversation?*
- *Are some meanings better to learn new insights from colleagues?*
- *Are some tokens more fun to discuss?*
- *Is the experience accessible and inclusive?*

The validation will be explained in more detail in the following sections: 10.2 Method, 10.3 Pilot study, and 10.4 Results & discussion.

## 10.2. Method

This section will comment on the process used for the validation, the data collection, and participants.

The validation consisted of five online sessions in which the Totem Experience was carried out. It was voluntary to join and our contact at the office used internal office channels to promote the activity. Data was collected through a short survey that each participant had to fill in after each time they participated. More about the process, the data collection, and the participants is presented in the following sections.

### 10.2.1. Process

The validation was performed by conducting the prototype experience with users. The original intention was to carry out the experience on-site in the office which would have enabled an investigation of the role of the physical product, and to conduct observations. However, due to the Covid-19 pandemic the company could not promote physical gatherings, and thus the experience had to be designed to be carried out online.

The Totem Experience proved being versatile considering that with minimal changes, the experience could be carried out on the new digital platform. The experience was set to happen during lunch breaks every day for five days in a row, and it would last for around 30 minutes including introduction, the experience, and filling out the survey. This left around 15 minutes per day for participants to talk. The authors considered having the experience either at lunch break or during the morning break since most employees took breaks at these times, and thus they would be able to participate. In the end, the lunch break was selected by recommendation of the contact at the office who suggested that employees would have more time and be less likely to have meetings at that time.

Having the experience in a digital environment had a few implications for the intervention. The first one was that, to facilitate conversations through a video call, it was decided to limit the number of participants that could join the same session. This was as response to concerns that those sessions with a large number of participants would lead to some employees being left aside and not taking part in the conversation. To avoid that, it was decided to limit the number of people that could be together in the same group to five, and random break-out rooms would be implemented if the number exceeded five. With sessions of five participants, it was considered unlikely that someone could be left aside in the conversation, while allowing an unlimited number of participants to take part in the experience at the same time.

The creation of break-out rooms meant a change in the concept of the Totem Experience. The original intention was to let participants find other people and thus organically create casual encounters. With the imposed break-out rooms, the experience was less organic than was initially desired. However, this was the only way in which the experience could be carried out, ensuring that the conversation in the video-call would always be possible and that there would never be too many people.

This also had a consequence; that the original way in which tokens were going to be handed out was no longer suitable. At first, the idea was to hand out one or two tokens per participant and let them freely find people who would fit the token criteria. With the new break-out rooms, conversations would happen in groups, and thus it was not reasonable to give each participant a set of tokens. Instead, the group as a whole would be given a number of tokens that they should award among themselves.

The tokens that would be handed out were randomized, as would have been in the physical experience. A random token picker was coded to ensure that no group would receive the same token twice, and to prioritize new meanings over tokens that had already been discussed. It is worth mentioning that after a few sessions it was learned from the answers to the surveys that participants showed a preference for more specific and difficult tokens as they were more fun to discuss. In consequence, the later sessions incorporated a manual selection of some meanings in addition to the random generator to ensure that each group would have at least two more specific tokens.

The decision was that each break-out room would receive seven tokens to discuss; the reason behind being to give one token per person and a few extra ones in case some meanings did not apply to any of the participants. This number was also chosen taking into consideration the time available for discussion in each group. Other than that, there were no other arguments supporting the use of seven tokens, in fact one intention with the validation was to find the right number of tokens to give away. The selected tokens were placed in an image and the images were sent to the group that had to discuss them through the chat in the video call. The image displayed the shape of the token, the name, and a brief description of who (i.e., type of person) should receive it. An example of file used for this purpose is shown in Figure 24.

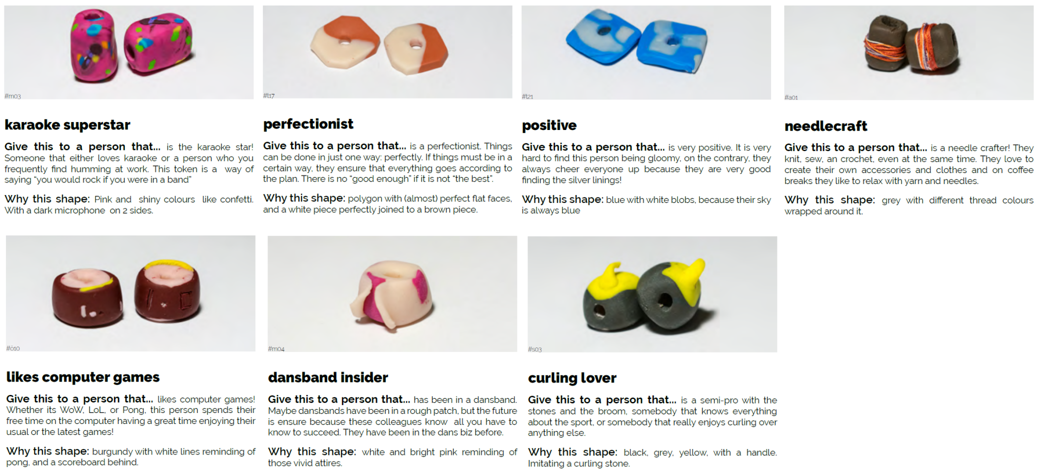



*Figure 24: Example of image given during validation*

As to the planning of the session, participants would join at 12:30 each day, and after a few minutes of waiting for everybody to join, a brief description of the experience was provided and the aim of the work was explained to the attendees, after which they would be divided in break-out rooms of maximum five participants. After this, the images with the tokens to discuss were sent to the private chat of each individual break-out room, and participants were reminded that the experience would last 15 minutes. A timer was set to bring everybody back to the main session after 15 minutes. Then, participants were asked to tell their thoughts about the experience, and then write down which tokens each of them had received. The purpose of this was for the authors to create their physical Totems and deliver them to the office once the experience was over, opening the door for future research about the role of the physical product in the user's experience, but also as a sign of gratitude for their participation. Finally, participants were asked to fill in the short survey, and then the experience was finished for the day.

### 10.2.2. Participants

The validation of the Totem Experience was announced to all employees of the office of study through an open invitation to participate. The promotion was carried out by the contact at the office, who sent the invitation through the internal channels of the organization. The activity was also set as an event in the calendar of the organization so that it was visible for all employees, and they could easily confirm their participation in advance. The experience was also promoted in the office´s monthly meeting, giving basic information about the study and how to join the validation.

The activity was free to join, so there was no need to select participants. This could mean that only a certain user group took part in the experience (e.g., people that are more social) which could have led to skewed results. However, it should be kept in mind that understanding which profiles choose to participate, and which decide to not take part, is also worth studying.

### 10.2.3. Data collection

A survey was designed with the intention to validate the intervention, answer research questions, and validate assumptions. Surveys were used because they offer a way to obtain answers for specific topics while requiring limited involvement from respondents. Furthermore, surveys would allow having answers from all participants after each session, adding a way to have instant feedback about the experience and allowing the authors to make modifications to it if needed. Another advantage is that it enables the authors to see how and if the opinions about the Totem Experience would evolve with time as participants take part in more sessions by making different paths for those who attended the first time and those who had previously taken part in the experience.

The survey used Likert scales and open questions to find users' perceptions about the Totem Experience. Likert scales are considered an efficient way to get participants' perceptions about specific topics, while open questions enable participants to share other general reflections.

The questions asked through Likert scales aimed to investigate to which extent participants agreed that the intervention did achieve its goals. These questions were written according to the goals of the intervention, such as "It was easy to start conversations", "I've met people I don't often interact with", or "I feel closer to my colleagues". A question on the general perception of the experience was asked as well through this method to evaluate if, in general terms, people liked (or not) the activity.

The open questions were used to allow the participants to share their perceptions about tokens and some general reflections. To seek information regarding which meanings were perceived as "better", participants were asked to write down which tokens were easier or harder to hand out, and which were particularly good or bad to create conversation. The survey also offered a space for participants to share other opinions and concerns, for example "Was there any problem during the experience?", or "Is there anything else you would like to tell us?".

The surveys were designed to be filled out within about 5 minutes so that participants could be encouraged to fill in the form right after the experience, before leaving the video call. This way, the risk of people forgetting about the survey and not answering it was reduced. While it could be argued that filling in the survey right after the experience could show slightly different results than if people had more time to reflect about it (e.g., people who were happy with the experience could feel in a good mood and be more generous in some questions), the main goal was to acquire enough answers so that the validation could provide relevant findings. This was decided because if it was left to the participants to decide when to fill in the survey, they could either forget or lose the link. The authors had no access to the participants outside of the session.

Finally, the surveys were analysed by considering the distribution of answers for each Likert scale statement. The benefit of Likert scales is that the results can be processed as quantitative data while referring to qualitative aspects. Hence, bar charts could be plotted showing the distribution of the number of participants who agreed or disagreed with each statement. By looking at the distribution, it could be easy to tell if the majority of participants shared the same view, if they disagreed, or if there was no clear consensus. As to the open questions, they were used to capture reflections about which tokens were preferred and general thoughts about the experience. From the surveys, it became apparent that participants liked to discuss more difficult meanings than originally considered. Answers to surveys enabled the authors to take action and try to provide each break-out room with more difficult tokens from that moment on.

## 10.3. Pilot study

A pilot experience was performed online to try to identify limitations and areas for improvement in the planned experience. The study was carried out with five volunteers from a Spanish youth association with similar social characteristics to those identified in the office of study. For example, the group for this pilot study included people who had been working together remotely for around a year, having no face-to-face contact at that time, and while most participants knew each other rather well, none knew many things about each other's hobbies and personal life. Furthermore, the group was culturally diverse, with people living in three different countries, on two different continents. While this is not exactly representative of the situation at the office of study, it was considered that a pilot study in this situation would still provide valuable learnings for the real validation at the flexible office, and, in the best-case scenario, the distinctive multiculturality at the association could reveal interesting insights that would otherwise have been missed. It must be pointed out that one of the authors was part of the study and is also a member of the association. Their role in the pilot study was both as participant and as facilitator of the experience.

The experience was carried out according to the protocol described in the section "8.1 The experience" with two main changes. Firstly, the number of tokens discussed was much greater than seven, and the time allotted for the pilot session was longer. The goal was to evaluate how many tokens could be debated in a certain amount of time and use that knowledge to decide on the number to be used in the Totem experience. Secondly, the tokens selected were not random. Tokens from different categories, difficulty, and of different types (personality traits, hobbies, knots) were used. The goal was to identify different outcomes with different tokens.

The results of the pilot experience were important for the final experience. For example, it looked like seven tokens was a suitable amount for 15-minute conversations. Furthermore, 'knots' were discarded. The pilot revealed that there was no need for a knot that requires a large group to have a discussion when all tokens are discussed in groups. Furthermore, the discussion about knots was awkward since nobody knew exactly what to say, which leads to believe that *would-be:s* would not have worked if done face-to-face. The pilot also showed promising results in terms of creating personal conversation and making people more aware of each other. This claim is based on observations since the survey was not used in this case.

## 10.4. Results & discussion

In this section, the results from the validation study are shown. Findings will be commented on to identify which aspects of the experience worked better, and aspects that may not have worked as expected. In addition to the answers to the survey, there will also be insights provided by the designers'/authors' contact at the office during an informal conversation.

The general results from the evaluation are very positive. Almost all participants answered the survey after the experience (20 answers out of 22). Out of those, 14 were a "first time experience", while the other six were returning participants, and out of the later ones, four had participated twice and two three times. The aim of this division was to seek information regarding the loss of any novelty effect, yet the few answers make the results non-representative and not possible to extrapolate to other cases. Yet, the general results of the survey seem to support the goals with the intervention.

The following section will explain those results and will be divided into the following subsections: Validating the intervention, Perceptions about the experience, and General insights.

### 10.4.1. Validating the intervention

This subsection will focus on analysing the answers to those questions more closely related to the goals of the intervention in order to evaluate to which extent it was successful.

Totem was previously defined as a product to enhance the social scenario at the office by increasing social awareness and encouraging non-work-related conversations between all the employees, at the same time it is to provide a way for self-expression. Hence, some of the key aspects to test were the extent to which it helps create conversation, meet new people, learn personal things about colleagues, sustain non-work-related conversations, make employees feel closer to each other, and communicate one's personality. Participants agree that the experience was fruitful in most of those aspects, as can be seen in the results shown in Figure 25.

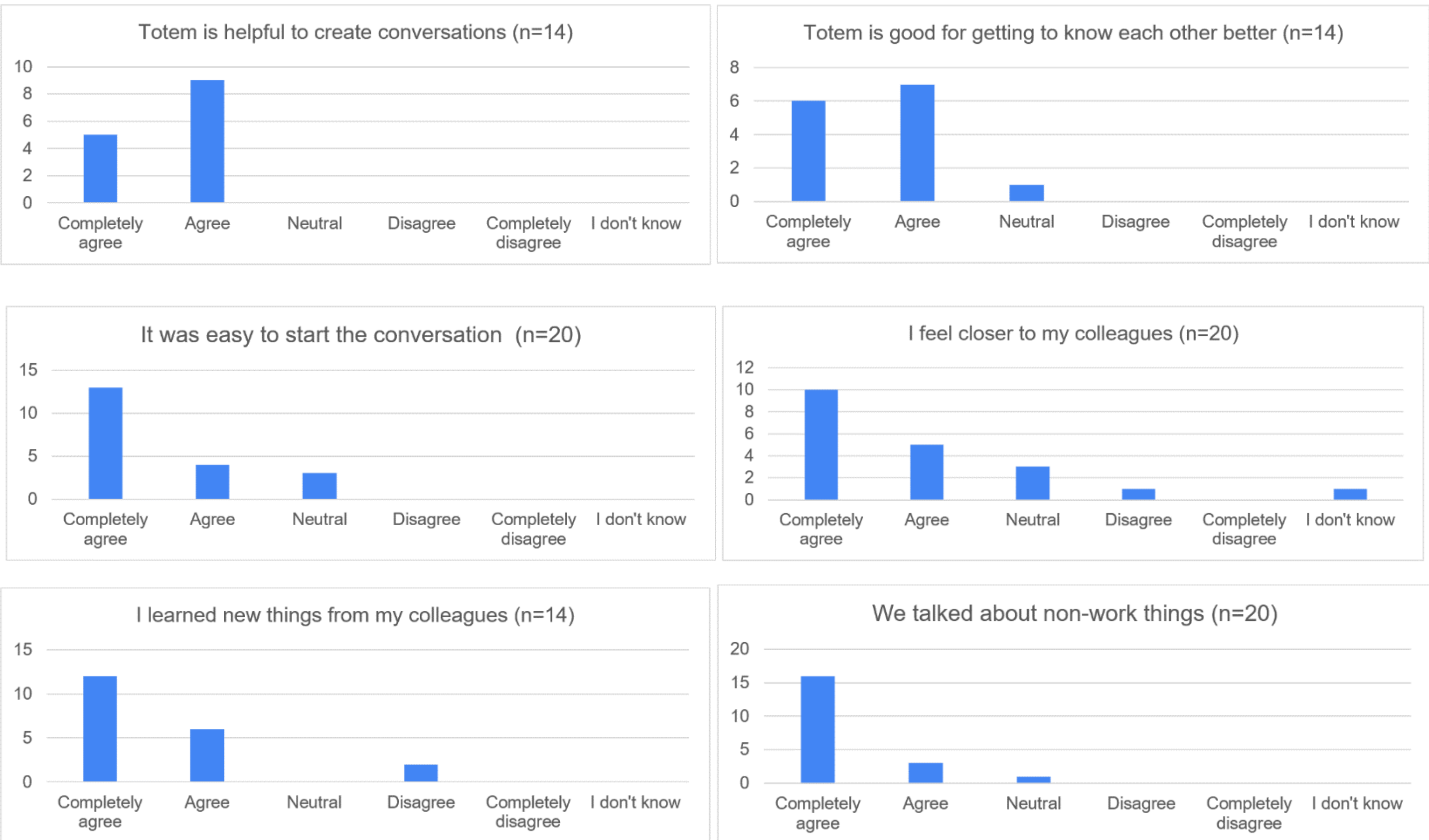



*Figure 25: Participants' responses to Likert statements*

There is a general agreement that the experience was positive. However, there are some other key areas where the participants did not agree to the same extent. The categories where this happened were: “Tokens describe people well”, and “I met people I don’t often interact with”.

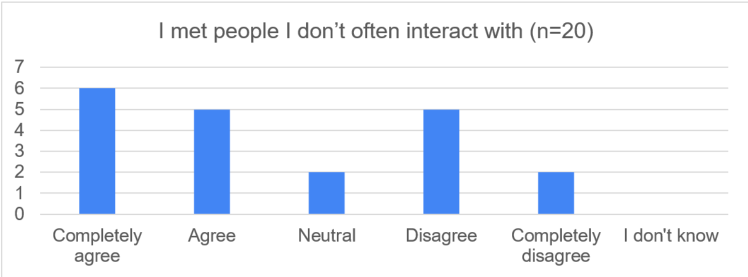
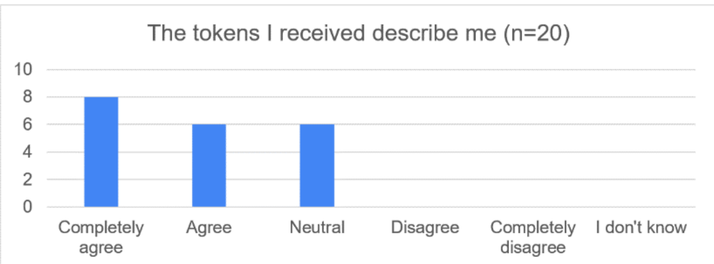



*Figure 26: Participants’ responses to the statement "I met people I don't often interact with"*

As seen in Figure 16, there are mixed results regarding if the experience was useful in order to meet new people or not. One explanation for this is that in some sessions, the participants already knew each other rather well. Unfortunately, given the limited number of participants per day, this was something that could not be avoided. However, there is a second reading about this; that participant had a different understanding of what it meant to “often interact with someone”. Some participants would say at the start of the session that they knew each other, but that does not necessarily mean that they had a close relationship, rather that they recognized each other and knew basic information about them.

As to the question regarding if tokens describe one’s personality well, there seems to be some confusion. A similar question was asked twice, but the results for each of them seem to be different. As seen in Figure 27, when asked if the tokens they received described their personality well, there was a fair consensus that they did, to some extent. However, when asked if tokens could describe people well, in general, there is a spike in ‘neutral’ answers. It is unclear what could be triggering these responses. One assumption is that it could be that the participants, being aware that they know only a few of all the existing tokens, would play safe towards a more neutral answer.



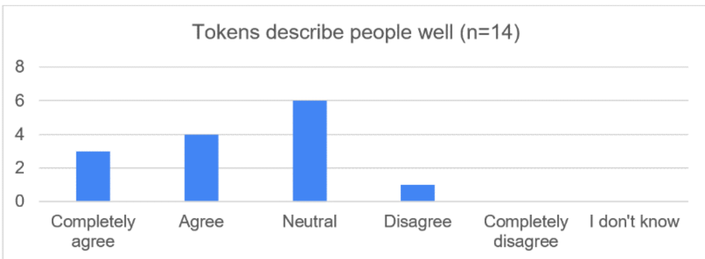




*Figure 27: Participants’ responses to the statements "The tokens I received describe me" and "Tokens describe people well"*

This however does not explain why there is an answer that disagrees with “Tokens describe people well” but every answer is neutral or agrees with the statement “My tokens describe me well”. Another explanation could be that out of the given tokens, only the tokens that described those in the group were handed out, leaving behind those that did not have anything in common with the participants. This way, the general average of “accuracy in describing people” of tokens would be lower in general, than those received. In any case, one participant shared an interesting reflection: “It is not only about receiving tokens that describe you, it is also about creating fun things to talk about. I can take a token just because I think it would be a fun discussion topic”. This statement led to believe that some people may have different understandings of what their Totem should be, and maybe they are not so worried about it describing them well as much as it being a fun thing to have.

Finally, it was also important to know the possible long-term implications of the experience in the dynamics at the office. For this purpose, participants were asked if they thought they would talk more to the people they met during the session. The results for this question can be seen below in Figure 28 which show some optimism. However, it is important to point out that this question was asked only to returning participants, hence these results should be considered prudently. More research should be done in this field to have a proper understanding of the long-term impact of the intervention.

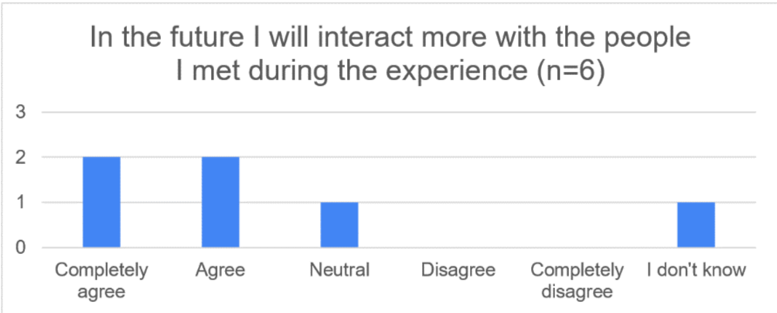



*Figure 28: Participants' responses to the statement "In the future I will interact more with the people I met during the experience"*

### 10.4.2. Perceptions about the experience

This section will focus on the answers to those questions aiming to understand general perceptions about the experience itself; for example, if it was fun, if the environment was good or if they liked it.

The first questions addressed the "ambience", meaning the general feeling of the experience. These questions aimed at learning if something surrounding the experience could have negatively affected the results. As seen in Figure 29, this was not the case, and people felt comfortable during the session.

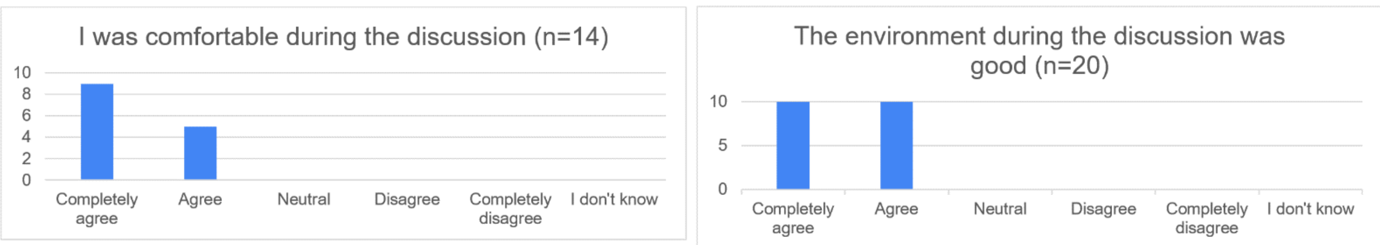



*Figure 29: Participants' responses to the statements "I was comfortable during the discussion" and "The environment during the discussion was good"*

More interestingly, regarding if participants liked the overall experience, two questions can shed some light about this: "I liked the experience", and "I would take part again". The results from those questions are favourable, with only one participant being unsure whether they liked it or not, and over half of the participants saying they would like to take part again.

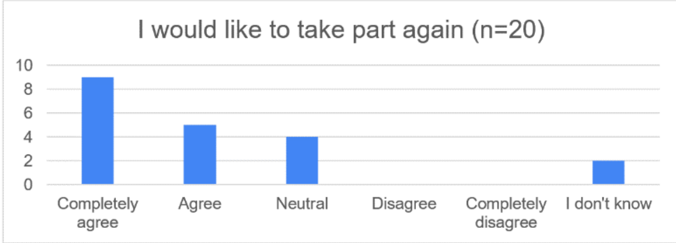




*Figure 30: Participants' responses to statements "I liked the activity" and "I would like to take part again"*

Fourteen out of 20 participants said they would like to take part again, whereas only six were unsure, see Figure 30. However, only four participants took part more than once. This could either indicate that participants were not entirely honest in their answers and wanted to praise the activity, or that their schedules and workload made it impossible for them to join a second time. None of these two conjectures is supported by other data, so the reasons behind the lack of reiterative participation are inconclusive.

### 10.4.3.General insights

General insights from the survey, including the written answers and comments noted down from the sessions will be discussed in this section.

First, as to the research question regarding which meanings are best to generate a fun conversation, there seemed to be no agreement. Some found it fun when the group discovered that they had something in common, for example in the answer: "Cat lover was fun to discuss, because most of us had connection to cats". Others liked it the most when the tokens had a little more eccentric meanings: "Today the tokens were harder to give away but also more fun to talk about". A different position was related to how accurately a meaning fitted someone in the group: "Those which made the best match was most fun". It is interesting how "fun" and "relatability to the meanings" can be both connected or disconnected.

In line with this, one participant said: "It is not only about receiving tokens that describe you, it is also about creating fun things to talk about, I can take a token just because I think it would be a fun discussion topic". This could mean that a participant could talk about their experiences concerning one meaning to be able to receive it just for the sake of a fun conversation even if their relationship to the meaning of the token was in the past and it is not something significant for them anymore. This is a curious and unexpected scenario of interaction with the intervention.

On a similar note, there is an interesting reflection regarding the ease to hand out tokens. When planning the experience, it was considered that there should be tokens, ranging from easy to hard to hand out due to the characteristic they refer to. For this purpose, participants were asked how easy it was for them to award the tokens that day.

As seen in Figure 31, there was a general consensus that it was easy to hand out tokens, but three answers stand out for disagreeing with this statement. There are two statements from participants of which one explains why they did not find it easy: "It was quite hard to give away because we didn't know each-other that much". It is important to highlight that the same participant agreed with "It is easy to start conversation" and with "I learned new things about my colleagues", which leads to believe that not finding tokens easy to hand out, is not necessarily an issue.

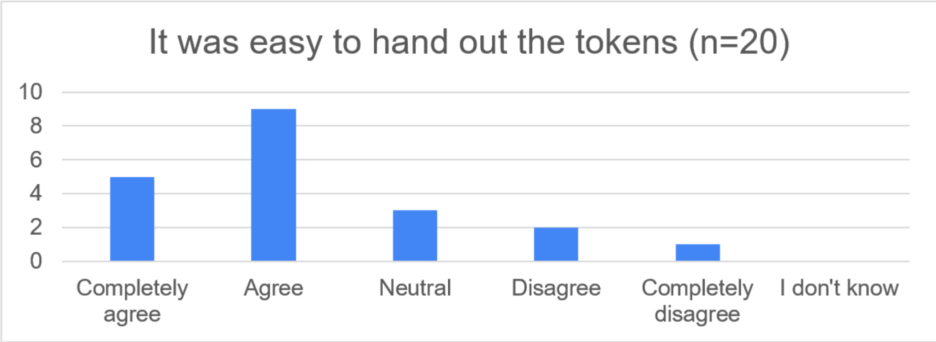



*Figure 31: Participants' responses to the statement "It was easy to hand out the tokens"*

Another interesting insight about tokens is captured in the following quote: "Karaoke, curling, dansband, needle they are interesting to talk about and make you talk about things you normally don't talk about". It is worth noting that two of these four examples were initially considered to be 'hard meanings' and were expected to be difficult to award, but more amusing to talk about. However, from this statement it could be deduced that difficult tokens might be the right approach to create more fun and insightful conversations. There is a number of answers that support this assumption, like "Today's tokens were harder to give away, but also more fun to talk about", or "All the little more crazy ones such as curling, needle, karaoke (were more fun to discuss)". It is also important to keep in mind that despite these comments, most participants did not share their opinions on the matter, hence, one should be cautious making assumptions from it.

Regarding if the intervention increased social awareness, a comment by the contact at the company, who participated three times, is thought to shed light on this matter: "It is easier when you know a bit about each other. You go a bit deeper in the conversation. It is also fine when you don't know them because you get to know a bit, but the conversation is not the same. Yet it was good because you find different levels depending on who you are with". Furthermore, the general results shown in the section "Validating the intervention", show that most of the responses to the statement "I have learnt something about my co-workers" are positive. The two "disagree" answers are explained when compared to the participants' other answers. In their session, they had not met any new people, and those answers were also from the first experience day, which means that there was a higher number of more common tokens. This could explain the negative answers. The results from this question are overall very positive.

In relation to the aim of creating a culture of appreciation, there were fewer but still positive comments from other participants. For example: "It's nice that everyone is humble, it gives the opportunity to say what you really think about your co-workers", or "It's like you really need to earn it", in a sense that they would give a token to someone who they really think deserves it. This is something interesting to study further, also about the possibility of the Totem becoming an object with emotional meaning for the participants.

A final insight observed by the authors was a curious dynamic that took place in four out of five sessions: all the participants were awarded the same number of tokens. Since the sets of pictures were always seven, if there were three participants in the group, they would receive two each, leaving one unawarded. When there were four individuals in the group, each got one token and they left three. The only exception took place during the last session, where all the participants knew each other well and gave different numbers of tokens to each other. This could be due to something cultural, but the reasons are not clear to the authors. This is pointed out because an initial idea was to note down the tokens left unawarded from each session, to look for possible patterns of "worse" meanings, yet this happenstance reduces the possibilities of discussing that information. The only reliable information regarding this matter is, therefore, the specific comments by the participants such as "We could not give away magician and like crime stories", "We found no dancers or good leaders", or "Nobody likes football" out of which no further pattern was discerned.

An interesting piece of information related to this is the fact that, from all the specific meanings mentioned during the survey by participants (n=20), only three times were trait tokens mentioned. This could mean that hobbies were the most discussed topics and those which might trigger more engagement. It could also have been due to the fact that one needs to know the other people in their group to be able to award them a personality trait, and it could be less comfortable to spontaneously share information regarding your perception of your personality "I think I am a funny person", than telling a funny anecdote. The reasons behind this are hence inconclusive but could be interesting to study further in this direction.

#### 10.4.4. Delimitations

The validation study provided valuable feedback about the intervention that seems to validate most of the goals and assumptions formulated during the design phase. The Totem Experience is considered to facilitate conversations, sustain non-work-related conversations that help to learn new things about colleagues, and overall move the office forward towards the sense of community.

The study presented one major limitation and was the ability to assess if the intervention could ensure the mixing of social silos. The free-to-join online experience ensured there were participants to every session, but authors had not sufficient control to ensure that people from different silos would meet. In consequence, further studies are needed to validate this goal of the proposed solution. Other aspects like 'accessibility' or 'inclusiveness' have the same limitations and they can only be validated with a new study. In the same way, to assess the role of the physical product (tokens and Totem) in the overall perception of the experience, including emotional responses of the product on participants, require of a new physical study.

# 11. General Discussion

This section will discuss the results achieved and methods used in this master's thesis project. The discussion is divided in the following subsections: discussion of the results, discussion of the method and future work.

## 11.1. Discussion of the results

The discussion of the results will cover the interpretation, implications and non-method-related limitations of the results of this thesis. This will be organized according to the research questions posed.

### 11.1.1. RQ1: What are employees' perceptions of the social scenario at the AFO?

The user study found that, at the particular office, there was a general positive perception of the social scenario at the office. The most common social interaction problems in AFOs, lack of privacy and territoriality, were not identified as a mayor barrier. The minor issues related to social interaction and social well-being at the office were: lack of purpose to start a conversation, lack of topic and common ground to start a conversation, and difficulty to know if people are working or just talking.

The general positive perception of the social scenario comes possibly from the culture that the company in question is making a huge effort to promote. The company strives to be welcoming, open and friendly, but also to create a similar culture at the office. This high emphasis on culture was found by the authors to be key to the social scenario and social well-being of the employees. Alternatively, the positive perceptions could have been enhanced by the existing division between departments, where a closer social interaction takes place. These social silos could work as small communities, which could lead to a greater sense of belonging, and hence enhance their perceptions of their social well-being (Kawachi, 2001).

The interviewees reported some barriers to social interaction, both due to a lack of purpose and of topic to talk to other colleagues. These barriers could be strongly linked to the culture of the country, which could question the applicability of this findings to other cultures or countries. Problems to start a conversation seem to also be tied to each individual's personality. As one would expect, interviewees that were more outgoing and liked to chat with colleagues said they had no problems at all, while the difficulties for more introvert employees to chat could be attributed to the aforementioned 'lack of purpose' and 'lack of topic'. It is worth pointing out that the culture of the country and personality of employees may be related, and hence both be responsible for this problem.

Finally, one last barrier was identified from the interviews: it was that sometimes hard to know if the employees could join and talk to another group of people or if the group in question was working. This is thought to be the outcome of ineffective strategic communication by the office when it comes to the 'lounge', as could be understood from some interviewees asking for a break room, even though they used the lounge as such. In any case, this shows the relationship between the planning of the office and communication of the company with employees' perceptions of the space, and the dynamics which the space enables. The results from the user study are line with findings from the literature (Babapour Chafi, 2019) and evidence the need for careful planning, and even mixing employees in the planning of the space for greater social well-being.

These results reveal the importance of the employee´s personality; but most importantly, of the culture of the office and its impact on social well-being. In this regard, literature up until the moment has focused on specific aims like raising awareness or understanding the effects of the physical space on employees, with little or no mention to how the culture at the office is, or how it promoted or acted as barrier for the issues found. The researchers believe that the future studies on social well-being at AFOs should keep a close eye on the culture at the office, since through a deep study and understanding of it, the roots of the common issues at AFOs could be explained.

### 11.1.2. RQ2: How has the physical space at the office affected social interaction after the relocation?

For most of the interviewees, the relocation to the AFO brought with it some changes in social dynamics. However, the most noticeable finding from this study is that cultures from previous offices remained after the relocation.

This phenomenon could be supported by the use of the AFO. Departments used to work together in their own, respective offices before the relocation where they developed their own cultures. After the relocation, those old cultures remained. The authors argue that this happened because the new flexible office enabled them to keep their old dynamics, but also because there were no triggers nudging these old groups to develop one common culture. In other words, despite having new 'resources' to their disposal (i.e., even when they could meet new people), there was nothing encouraging groups to interact with each other.

The implications of this are that after a relocation to an AFO, in order to generate a cohesive community, there must be some triggers that promote the creation of a common culture. The Totem Experience addressed this issue by providing an explicit activity to engage in conversations and create ties between silos. However, whether the intervention promotes a common culture is hard to tell since it was not possible to measure the long-term implications.

On a final note, it is important to highlight again that the physical space itself was regarded very positively through the interviews. There was one under-used area, and the purpose of another area was not communicated effectively, yet the employees did not seem concerned at all by these. In fact, they made very positive comments regarding the air, light and other aspects that they seemed to esteem more. In addition, employees found in the office every necessity that their job required. All of this compared to the literature found, shows that in this case, the office´s distribution plan and was implemented successfully, which the authors believe contributed to the absence of issues found. For instance, problems within territoriality such as appropriation of the "best spots", cannot happen if all the office is well illuminated and similar conditions are ensured throughout the space.

### 11.1.3. RQ3: How can the social well-being at an AFO be enhanced through a design intervention?

This project has identified a number of ways in which social well-being could be enhanced. The aspects that the Totem Experience focused on were creating more personal conversations, fostering inter-departmental socialization, and creating a sense of community or belonging through a lightweight intervention. The results from the validation proved the intervention to be successful.

One assumption is that, by enhancing general social awareness in AFOs, common issues like appropriation of workstations, ignoring the clean desk policy or behaviours such as "it is not my problem to fix this", which affect social well-being as well, could be mitigated. This is because these kinds of problems seem to be linked to what Colenberg et al. (2020) identified as general indifference, decreased responsibility and emotional social support. It is important to note that since the office where the intervention was validated already showed a favourable culture and no friction between colleagues, it could not be verified whether the assumption is real or if the intervention can serve that purpose. Future work should research more in this potential benefit from such an intervention.

## 11.2. Discussion of methods

The results of the project have been satisfactory since it was possible to answer the research questions and the proposed design intervention received good feedback. This leads to belief that the methods used for this master's thesis project were pertinent and useful. However, the process was not free from issues, the context in which the project took place affected methodological decisions and some stages were not carried out as were initially intended. This section will elaborate on the methods used.

### 11.2.1. User studies

The project would have benefited from conducting on-site observations during the user studies. Observations would have helped the authors to understand sides to social dynamics that employees may not be aware of. Observations would have also been useful to better understand some phenomena that were not entirely clear in the interviews. In any case, observations were not a viable method due to the Covid-19 pandemic.

As to participants, it would have been preferred to have an initially wider range of individuals to which apply selection criteria for the interviews, but few people volunteered for the studies. This left the authors with little room for the sampling. Nevertheless, the issue was studied and ut was later guaranteed that the group of participants was diverse and representative of the office.

### 11.2.2. Validation

Another consideration about the validation is that the experience was originally conceived to be carried out physically and was adapted to be performed online. Tokens were crafted to communicate the meanings they protected, but also to trigger emotions. With the digital validation and the relatively short span of time it lasted, part of the product experience was lost and collecting data regarding the perceptions of the physical product, or a possible emotional response to the product were not possible.

Despite not being able to carry out the original physical experience, the results from the validation seem to confirm the main assumptions it aimed to answer. However, it could not answer other relevant questions, such as the relationship between culture and intervention, or long-term implications of the intervention. It is unclear whether these questions could have been answered through a validation conducted in the office of study during the Covid-19 pandemic.

As to the sample, the experience was free-to-join, and, thus, there were no criteria for selecting the participants. This could raise the question of whether the sample is representative or not, since some user groups could be over-represented (e.g., more social profiles). The implications of such a hypothetical skewedness would be that the solution could be less effective than what the results reveal since authors might be missing criticism from other user profiles. However, the intervention would have faced the same issue if it had been done on-site. It is an intrinsic limitation of the principle of ‘free to join activities’ that some groups might prefer to not take part. In consequence, it was considered that the results could be over-optimistic about the intervention, and future work should also try to understand the perceptions of those that chose to not take part.

All these considerations highlight the need to conduct new validations in other environments to have a clearer and broader idea of the strengths and weaknesses of the Totem Experience.

## 11.3. Future work

In the future it would be interesting to assess how access to the physical product changes the user experience, since this aspect could not be tested in this project. This would give some light on the perceptions of the participants towards the tokens and their totem, as well as if there is an emotional response after a more prolonged interaction with the items.

In addition, there are two more areas that this project could not address but are considered worthy of further research: long-term implications of the intervention, and relationship between culture at the office and the outcomes of the intervention.

A study about the long-term implications of the intervention would be useful to understand the size of the change that the Totem Experience manages. Some key aspects that are worth studying are to test the extent to which the intervention facilitates the creation of an office-wide community, prevalence of the impact after the intervention is gone, the extent to which it transforms the culture of the office, and the evolution of use and perceptions after the novelty effect and into the situated use. Furthermore, another aspect that could be tested in a long-term study is whether a greater social awareness mitigates common issues in AFOs like clean desk policy, noise, indifference, or incivility.

The second line of future work should test the intervention in different offices in order to understand how generalizable the results from this project are, and how applicable the intervention is in other contexts. After the positive results obtained in the favourable context of application of this project, it would be interesting to see if the intervention is still effective in other, less favourable environments. For instance, it is believed that this intervention could have a similar performance in co-working spaces, where individuals do not know each other very well and there is no incentive for general social interaction.

# 12. Conclusions

The aim of this work was twofold. First, it aimed to expand the research done in relation on AFOs and social well-being by studying the situation at a particular office. It was intended to identify perceptions of employees in relation to social interaction and social well-being, and to see how the social dynamics had developed after moving into the new flexible office. The second goal was to design and perform an intervention to enhance social interaction at the office and validate the approach.

The **first aim** of this master's thesis was answered through user studies. Interviews were carried out in a flexible office, answering the first two research questions. The answers to them are shown below.

*RQ*1: What are the perceptions from employees about the social scenario at the AFO?

The research found that there was a general positive perception of the social scenario at the office, which was regarded by most interviewees as "relaxed and welcoming". It was also found that this perception could be sustained by the positive culture at the company. However, there were some barriers to social interaction, which include: lack of purpose to start a conversation, lack of topic and common ground to start a conversation, and difficulty to know in a certain space of the office if people are working or just talking. Workload was also identified as a key limiting factor to social interaction, with some employees avoiding socializing and taking breaks in general when there is a lot to do.

Finally, at the company there seemed to be social silos. Each department had a closed social group that together organized social activities. Social silos were inherited from the previous offices that merged when the relocation to the AFO happened and have kept their old cultures. It is unclear whether the flexible office reinforces these silos, or if they just endured the merge.

*RQ2: How has the physical space at the office affected social interaction after the relocation?*

For most, the adoption of the AFO had not implied a big change in their social interactions. The remanence of social silos meant that most could only socialize on a regular basis with the same people and under the same circumstances as before the relocation. The exceptions were a few profiles who regularly engaged in inter-silo interaction. Those individuals were either very social or had worked developing the AFO and had a strong commitment to promote a more cohesive community.

As mentioned before, silos were inherited from the old offices. Despite the efforts to promote an office-wide community, these groups remain with their own culture. The research also identifies what seems to be a lack of cues nudging silos to merge and develop a common culture: work and social activities happen more often within these groups than across them. The reason why social activities that involve the whole office are less frequent seems to be that it is easier to organize events with fewer people.

The **second aim** of the master's thesis was answered through the validation of a prototype experience:

*RQ3:* How can the social well-being at an AFO be enhanced through a design intervention*?*

This project proposes Totem, a lightweight mediating tool to promote organic face-to-face interaction, social awareness, and self-expression. The Totem Experience uses Totem in an activity where participants are encouraged to go beyond their silos to learn things about their colleagues and acknowledge their virtues. The Totem Experience is a tool for companies willing to achieve superior cohesion between departments and/or individuals and enhancing the social scenario at the office. The intervention lets everybody choose to which extent they want to get involved and share information about their personal life, ensuring that everybody feels comfortable and welcomed to the experience.

In this master's thesis, project the intervention had to be adapted to an online experience instead of the physical one originally considered. Despite all, the results from the validation are largely positive. There was a consensus among participants that the intervention was helpful to create conversations, to know each other better, and to learn more non-work things about colleagues. Finally, participants also report feeling closer to each other, hence leading to believe that the intervention has the potential to create a greater sense of community. This way, there is firm ground to believe that this intervention would enhance the participant´s well-being by achieving a greater sense of community, which is based on the literature by Kawachi (2001).

In conclusion, the Totem Experience has proven to be a promising approach to promote more cohesive communities at flexible offices and promote social interaction, and at the same time it reduces common hindrances to social interaction (i.e., lack of purpose and topic to start conversations). Future work should test the intervention in other environments (e.g., offices with a less favourable environment, co-working spaces), test the physical experience, and measure possible long-term implications.

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# Appendix: Interview script

## Phase 0: Intro

Hello, we are Elena and Illán!

First of all, we wanted to thank you for participating in this user research for our master thesis.

As you know from the invitation, we are studying social well-being in flexible offices. Our goal with this interview is to better understand the social environment, interpersonal interaction, and workplace culture at your office. The questions are structured in 3 parts: context, social interaction and expectations for after the pandemic.

I will be the one conducting the interview and Illán will be taking notes.

(Ask for permission to record the session)

## Phase 1: Context

**General questions**

*First, some questions about yourself:*

What's your job in the company?

For how long have you been working in the company?

Did you get to work at the new flexible office? For how long?

How often did you use to work in the office? Have you worked in the office since the outbreak of the pandemic?

**Day trip in Mural**

*Now, we have a small interactive activity that we will do together in the online platform Mural.*

https://app.mural.co/t/socialinteractioninflexibleo8836/m/socialinteractioninflexibleo8836/1613731686265/fc8f216dabbe55ea761d93be480df01935dce75c

(Send link)

*This is mural, there will be two parts of the interview here. To navigate, you c an zoom in and out with the mouse scroll. To move things, you select by clicking wit h left button of the mouse and then drag.*

Okay, now let us know about your daily routines. Before the pandemic, how was a usual day at the office for you?

You have the map of you office as reference if you want to use it.

What activities did you do?

Do you meet people? When? Why? Where?

Possible follow-up questions:

1. Did you always use the same workstation?
2. Is there availability of appropriate workstations when you do a specific task?
3. Follow ups about explicit areas that they don't mention? (what about this area? do you use it?)
4. Is it hard finding people?
5. Why do you like/dislike [a certain area]?
6. How much of your working day do you spend on formal meetings and business conversations? (team working not included)
7. At what locations did you usually spontaneously catch up with colleagues?

So, overall, do you prefer working from home or at the office? Why? (reasons) What should be different for you to prefer working at the office?

%Time home-office. No, whats the ratio he would prefer. not need to chose home or office, but maybe 1day office a week, or 3 days…

# Phase 2: Social Interaction

*In the next section, we will focus on social interactions. First, some questions to understand better the current social situation.*

**Current social situation**

Since you came to work to the new office, have you met new people? Why? Did you know everyone at your previous office?

How would you describe the interpersonal relationships at the office? Did the office feel like a community?

Do you think there is any hindrance to start conversations? E.g. is it hard to “read the room”? Knowing if people are having a business conversation or just socializing and you can actually join? (not interfere)

Was it easy to find someone to socialize with?

Do you think there were any behaviours that caused friction between employees? e.g. people didn’t comply with clean desk policy, people were noisy…

How has the situation changed with the pandemic? How do you feel about such changes?

## Social initiatives

*Now, some questions about initiatives aiming at enhancing the social interaction in the office.*

Does the company organize social activities? Examples? **

Do the **employees** spontaneously organize social activities? opinión, involvem

Do you think that these activities make it easier to meet new people or to socialize?ent. **

Was it easy to find someone to socialize with?

** follow-ups:

1. Did you participate?
2. What's your opinion about them? How do you feel about these activities?
3. In your opinion, Were they popular amongst employees?

## Activity cards

*For the next part we will work with Mural again. In the lower part you can see a set of cards with different activities and situations.*

Which of these activities do you engage in on a regular basis? *You can move the cards and place them in the rectangle you can see on your right.*

follow-ups:

1. How often did someone visit your workspace for social talk with you?
2. Of the remaining ones, is there any activity that happens often in the office, even if you don't participate?
    a. Is there a particular reason why you don't take part in these activities?

*Of the activities that you have selected:*

Where do they usually happen? Is there any place in the office where they happen the most, or is there no difference?

When do they usually happen? How often? Are these scheduled or spontaneous? Is there anything that triggers them?

How do you feel about them? Do you like/dislike them? Do you think they are boring, stressing?

## Phase 3: Final Reflection

*Thank you very much! Now, we are entering the final section of the interview. Here we will ask some general questions.*

What is your overall satisfaction with the social scenario at the office?

What is your satisfaction with the different areas at the new office? What works well, what doesn't?

How do you expect the social situation to be when the pandemic is over?

What kind of activities/ initiatives could help you to reconnect with your colleagues?

If you could introduce something crazy at the office? *alternatively*: what is there left to be done that could improve the situation?

Is there anything else that you think we should know about the social environment at your offices? about the workplace culture?

## Phase final: closing ceremony

And that was all from our side. Thank you very much for participating! I think it was very interesting and we got a lot of refreshing insights.

We will share our research results with you as soon as the project is completed.

We plan to create a prototype that would enhance social interaction, would you be interested in participating in its test and validation? It would be during weeks 14 and 15 (5-16th of April).

# Appendix: Detailed US findings

Physical space

- The living room is a great socializing area, particularly around the entrance and the coffee machine. "It feels like you are almost forced to talk in that space"[I8].
- Complaints about the living room are: it is too open and noisy, it is uncomfortable to work there.
- There is rarely a shortage of workstations. It is not expected to happen after the pandemic.
- There is often a shortage of small rooms for meetings, calls, and focus groups.
- Some say the living room to be too big, considering there is a shortage of small rooms.
- Some quiet spaces are disturbed by the noise coming from the living room.
- Efficiency concerns include: "you have to walk a lot", and "it is hard to find people". Yet most do not seem very worried about it, some even seem to like that you have to move.

Culture

- Culture is perceived as an enabler of positive social interaction.
- The office is seen as welcoming and relaxed. Many consider this to make it easier to talk.
- People feel safe talking about personal or work-related problems, not just good or positive things.
- Many appreciate the social interaction in the office, but consider that there are too many formal meetings.
- Most participants would prefer to work only 3 days a week in the office after the pandemic. The main reason being that most meetings (and some other work) can be done from home more efficiently. The main argument to go to the office is the good ambience and meeting their coworkers.
- Culture may not be well communicated or understood by all. Despite the emphasis on promoting social interaction, many employees don't perceive interaction as a priority.

Social perceptions (social scenario + interaction)

- Breakfasts, fika break, and lunch are the key moments for socializing.
- There is no agreement on whether social activities should happen during work or outside work hours.
- Most socializing happens in social silos, often in work teams or departments.
- Breakfast and company-wide activities are the favourite occasions for socializing outside the silo.
- There is no real complaint about others' behaviour. Everybody complies with the rules (clean desk policy, etc.). There are occasional issues with phone calls.
- Some are reluctant to openly ask in their team´s chat about taking fika because they do not want to be the only one asking for it. The manager's attitude towards fika breaks was suggested to be key in relation to this aspect.
- Most find it easy to start conversations. Different personalities have different opinions about this.

Note: All these statements depend on the personality and other traits of each employee. Those characteristics were, however, exceptions and not the norm. Those being: living far, having small kids, preference for efficiency…

Activities

- Many activities are departmental (and the most frequent one is afterworks).
- Generalized morning fika enables communication with a wider scope of people. Yet there is a lack of spoken general culture about the afternoon one. This decision is left to each individual and most will prioritize work.
- Some regarded positively health-related activities at work or through work. From walking meetings to doing sports on their way to the office, or meeting to go to the gym.
- Games or having a playroom was suggested by many as positive activities to reconnect with team members and to get to know new people.
- There is low awareness of the activities that have taken place. There is an apparent disparity identifying the promoters of different activities, and to even acknowledge which activities are happening right now or took place before.
- Many said that the office is too big to organize activities for all the employees. It was suggested that it would be best to have smaller activities that could happen spontaneously and more frequently.

Hindrances to social interaction

- Some said that there is a lack of a topic or a motive to start a conversation with new people. “It is hard to talk with people from a different department, we don’t have much in common”. Another interviewee said this was natural because of their “Swedish culture”[I8].
- Time shortage was mentioned frequently. It was often related to either the high workload or because of their personal lives, it was complicated to attend after office hours.
- Lack of awareness of activities happening was another frequent reason.
- Pre-existing social silos are a hindrance to inter-departmental communication. Some social silos are inherited from old offices and still have traits from old cultures.
- There is a lack of opportunities to meet people from other departments, hence reinforcing the social silo gap.

# Appendix: Tokens catalogue

Type this link:
tinyurl.com/totem21

Or scan this QR code:

catalogue