

**ID3127**

**Future of Work**

**Trandisciplinary Innovation Project**





Co.Lab



## Group 5

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# Abstract

## How does the Hybrid settings affect the way we work?

Hybrid work is here to stay.

More than half of employees want to work in-office on some days of the week and spend other days at home or at co-working spaces.

The key benefit of hybrid work is that work schedules are more flexible, with employees citing more autonomy in deciding when and where they work. They are now better able to plan work around their life, instead of planning life around their work. Job satisfaction and perceived productivity has also been reported to increase due to the newly afforded flexibility.

However, work life balance became an issue. Employees and managers that don't enact clear work boundaries lead to higher levels of stress. Beyond that, hybrid work has made communication more dispersed - people find it harder to convey their ideas and understand others through conventional video conferencing, not to mention the noise disruptions faced in open office space concept. Lack of social interaction has resulted in erosion of company culture - an intangible asset built through meaningful interactions. It is harder to facilitate organic connections between colleagues in an online setting and over time, social capital networks in an organisation will weaken.

Our project explores how we use digital workspaces to instil a feeling copresence for all employees - driving effective communication and maintaining bonds within a company.



# Introduction



Future workspaces have to adjust to a hybrid model of working by **instilling copresence** through enhanced **digital workspaces** with embedded collaborative tools.

The pandemic has accelerated the transition towards a hybrid model of working, where some employees work in office and others work remotely. However, sustained effectiveness of flexible work arrangements require a blend of policy, physical space and technology. The balance between in-office collaboration and work from home differs across industries and job scopes, hence it is imperative that companies experiment and tweak their model instead of a blanket solution.

This project aims to enhance various forms of collaboration in hybrid work settings by tackling issues raised by working in remote environments. One of such issues would be the disconnectivity of employees from one another, that has been affected or even absent in the current/post-COVID-19 pandemic. A reduced sense of belonging to the company when in remote working environments is also another issue to be tackled.

Existing video conferencing software and online office spaces are not as effective as they can be - people are unable to detect social cues that drive discussions or use them effectively to encourage spontaneous interactions. Often, chance encounters also lead to us giving someone a missing piece of information or introducing a colleague with the right resources. Since the COVID-19 pandemic and the start of working from home (WFH), we have realized the importance and effectiveness of humanised interactions and conversations.

Without such interactions, social capital - the benefits that people can get because of who they know will be lost. People rely on social capital when they hit a dead-end and help others build their social capital when supporting colleagues with knowledge or guidance. One can turn to colleagues in the office due to the base of familiarity through these unplanned interactions that once filled our workdays.

Hence, our project solutions are designed with the purpose of building and restoring co-presence in workspaces. This entails enforcing a sense of belonging and connection with fellow employees and the company using collaborative tools and organising effective discussions and increased productivity through an immersive digital office with hybrid components.

# Table of contents

01 | Our Design Process

02 | Key Findings and Insights

03 | Overview

04 | Problem statement and Goals

05 | Our ideation Journey

06 | Personas and User Journey Maps

07 | Co.Lab

- Semantic Map
- Semantic Map + Swift Call
- UNoise

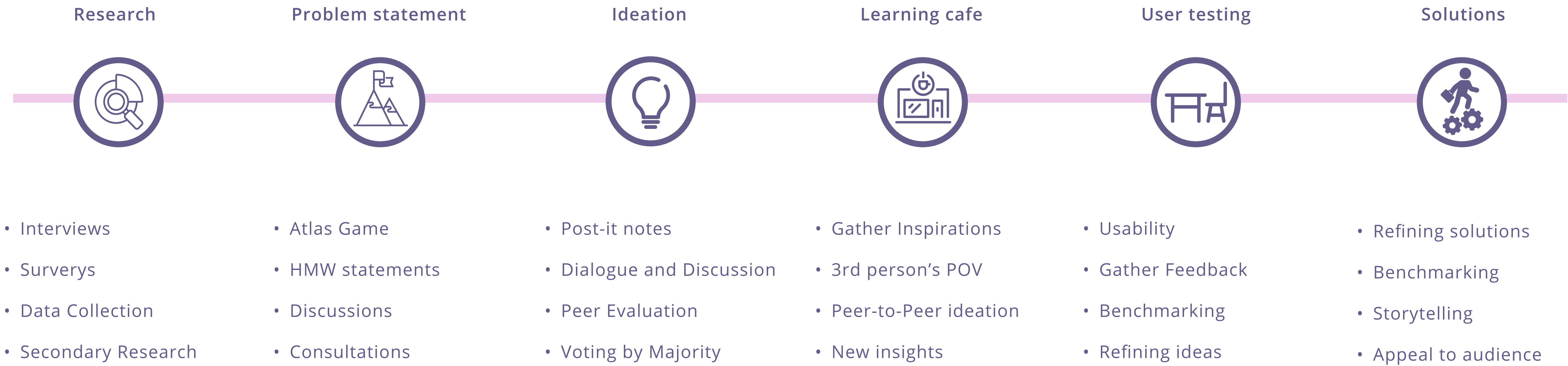
08 | Evaluations

09 | Conclusions

10 | Roadmap

11 | Working in TDIP teams

# Our Design Process



Our design process was most definitely **not a linear one**. Similar to the double diamond, we kept going back and forth before we got to our final solutions.

# Key Findings and Insights

Remote work has afforded employees autonomy and flexibility in terms of when and where they choose to work. Hybrid models in the future must accomodate to these new expectations and strike a balance between employee well-being and team productivity.

## Flexible work model

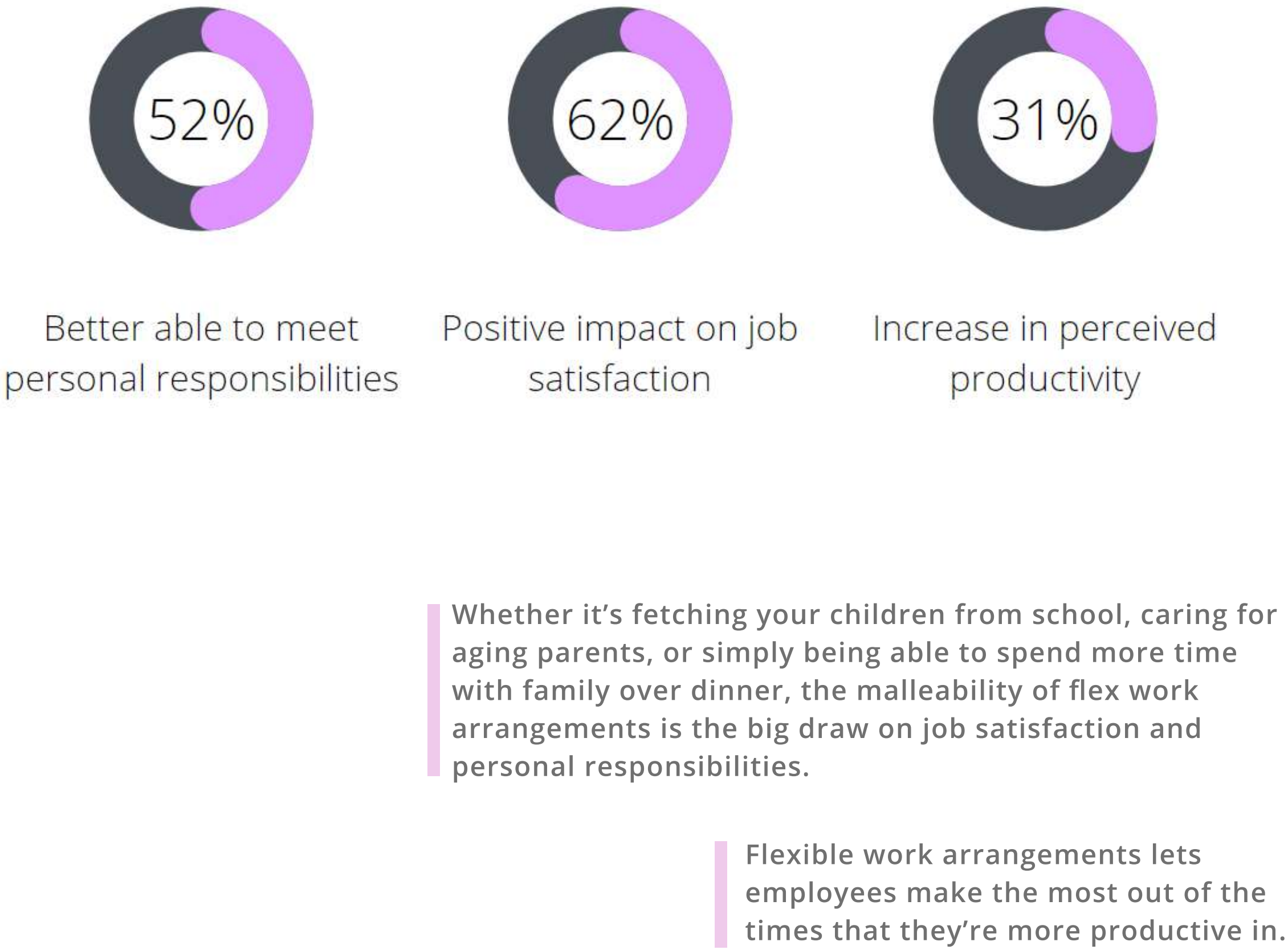
Employees want the best of both worlds: over 70 percent of workers want flexible remote work options to continue, while over 65 percent are craving more in-person time with their teams.

66% of business decision makers are also considering redesigning physical spaces to better accommodate hybrid work environments. It is clear that flexibility in work schedule will define the post-pandemic workplace.

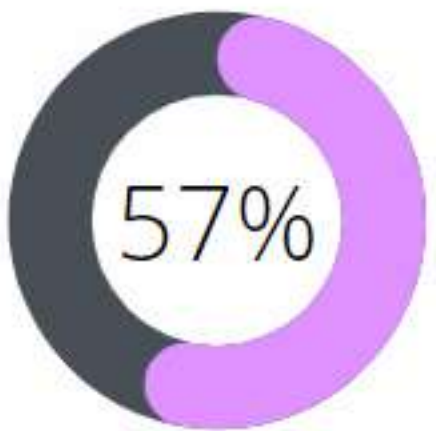
## Productivity x Satisfaction

With the afforded flexibility of planning when and where to work, some 62% employees reported higher levels of autonomy and work satisfaction. In the near future, hybrid work will allow them to pick their kids up from school in the middle of the day, exercise and have meals with their family.

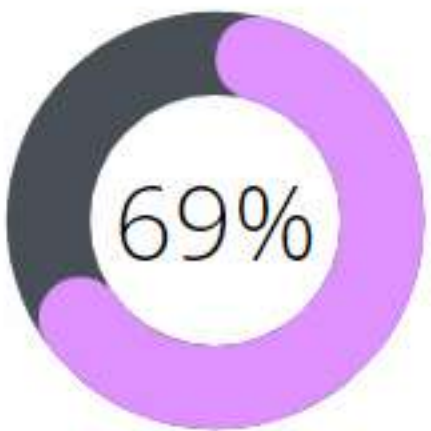
## Benefits of hybrid work



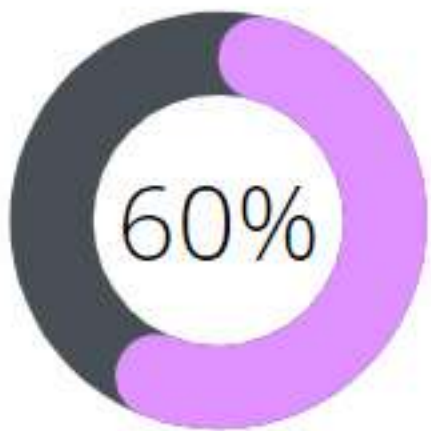
## Drawbacks of hybrid work



Blurred work-life boundaries



Noise disruption in virtual conferencing



Desire more social connection F2F



*“Zoom conferencing has its limitations. Detecting social cues is one thing, but a more pressing issue is poor sound quality and echo during hybrid meetings.”*

*Gen Y, Product Manager*

While many employees have cited that perceived productivity has increased, there has been blurring of work-life boundaries. Hybrid meetings may not be the most effective with existing conferencing solutions - noise disruption is an issue that is becoming commonplace given the trend of open work environments.

### Loss of work life balance

Productivity signals from Microsoft 365 encapsulate the digital exhaustion workers are feeling - 54% of employees feel overworked and 39% feel exhausted.

The digital intensity of workers’ days has increased substantially, with the average number of meetings and chats steadily increasing since last year. In comparing collaboration trends in Microsoft 365 between February 2020 and February 2021:

Time spent in Microsoft Teams meetings has more than doubled globally. The average meeting is 10 minutes longer, increasing from 35 to 45 minutes. The average Teams user is sending 45% more chats per week and 42% more chats per person after hours.

Workers are feeling the pressure to keep up with the barrage of communication. Despite meeting and chat overload, 50% of people respond to Teams chats within five minutes or less, a response time that has not changed year-over-year. This proves the intensity of our workday, and that what is expected of employees during this time, has increased significantly.

### Noise distraction

70% of office occupants were unhappy with the noise levels in their workplace. As employees return to the office, they will have uncompromising expectations. These expectations will include reducing office density and improving acoustics in the office according to a major study by Gensler (2020).

This report will explore how companies can elevate productivity levels through reducing noise disruption in open workspaces. Noise and distraction were already diminishing performance before the virus. How can we improve the conduciveness of hybrid work environments post Covid-19?

Additionally, employees in the future will spend less time in the office compared to before the pandemic, and this will lead to the gradual erosion of social connections at the workplace.

### Loss of social capital endangers innovation

The shift to remote work changed the nature of social capital in organizations. While employees report more meetings than ever, they also report more isolation and less connection.

One of the biggest changes we saw across secondary research was the significant impact that a year of full-time remote work had on organizational connections — the fundamental basis of social capital. People consistently report feeling disconnected, and in studying anonymized collaboration trends between billions of Outlook emails and Microsoft Teams meetings, we saw a clear trend: the shift to remote work shrunk people's networks.

At the onset of the pandemic, interactions within close networks increased while interactions with distant networks diminished. As people shifted into lockdown, they focused on connecting with the people they were used to seeing regularly, letting weaker relationships falter. Consequently, companies became more siloed than they were pre-pandemic. And while interactions with close networks are still frequent, we're seeing that now — one year in — even these close team interactions have started to diminish.



*“Networking as someone early in their career has gotten so much more daunting during remote work. Without hallway conversations, chance encounters, and small talk over coffee, it's hard to feel connected even to my immediate team, much less build meaningful connections across the company.”*

*Hannah McConnaughey, Product Marketing Manager at Microsoft*

*“I found it hard to bond with my colleagues when working remotely. It was also harder to gather feedback and expertise when I faced issues during product development - would've been easier if I had more interactions with them.”*

*Gen Y, Product Manager*



# Overview

Findings	Insights	Our proposed solutions	Goal
<b>01 + 02 + 03 = Co.Lab</b>			
<div><b>Loss of social capital endangers innovation</b> The shift to remote work shrunk people’s networks.</div> <div><b>Loss of work life balance</b> The average meeting is 10 minutes longer, increasing from 35 to 45 minutes.</div> <div><b>Noise distraction</b> 70% of office occupants were unhappy with the noise levels in their workplace.</div>	<p>Hybrid work makes it difficult for those working from home to approach others and most of them feel disconnected from others.</p> <p>Trend of open spaces to encourage the culture of openness and connectivity. Distractions in these spaces made it difficult to hear others.</p>	<div><b>01 Semantic Map</b></div> <div><b>02 Swift Call</b></div> <div><b>03 UNoise</b></div>	<p>Enhance connectivity of colleagues, despite working hybrid settings.</p> <p>Promote mentorship whilst respecting each others’ time.</p> <p>Maintain this sense of openness whilst allowing for comfortable and spontaneous conversations to occur.</p>

# Problem statement and goals

01 + 02 + 03 = Co.Lab

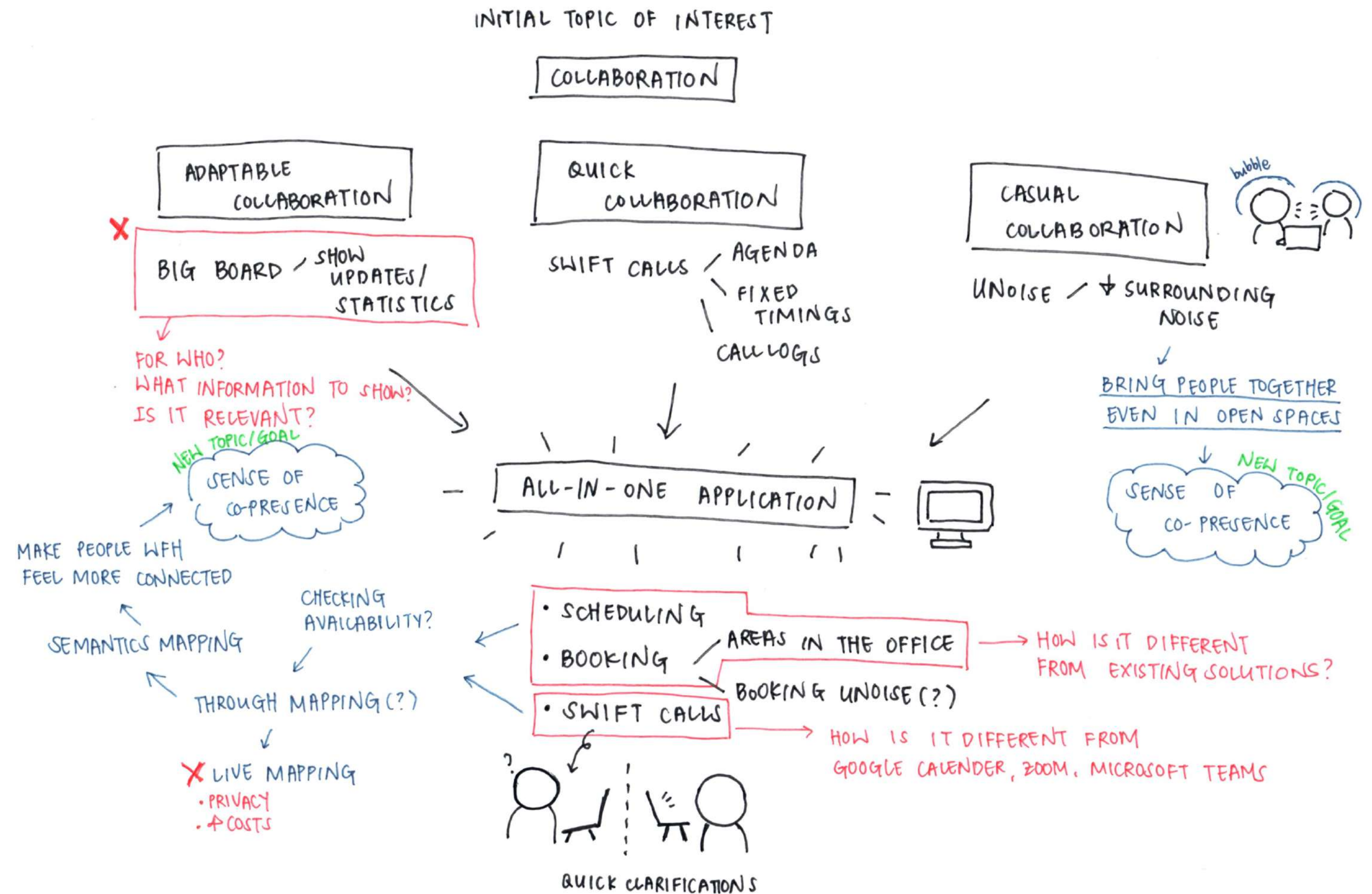
## Our Aim

We initially started off with the topic of collaboration. We split collaboration into 3 main sections, namely Adaptable Collaboration, Quick Collaboration and Casual Collaboration.

However, after the learning cafe and various rounds of iteration, we realised our ideas led to a more specific goal—instilling the sense of co-presence.

This led to our problem statement:

How might we foster effective communication in hybrid settings through a digital office space with smart collaborative tools?



# Our Ideation Journey

## Dialogue and Discussion

Our group’s main way of ideation was through the use of post-it notes, both physically and virtually (through Miro).

First, we set a timer to ideate individually, giving everyone the freedom to draw or visualise their ideas in any way they want. After our individual ideation, we proceed to share our ideas.

Everyone was given a chance to explain their ideas. The free sharing of ideas (with no judgement!) was really interesting as we get to see how our groupmates from different faculties, come up with those ideas.

We were then given time to vote on the ideas which we thought were the most promising or those we liked. We all had varying criterias as to which ideas were the best and this gave rise to very interesting outcomes as we try to combine some ideas together.

Discussions came after our indiviual dialogues about the ideas. Respecting the each other’s choices were also part of the process.



A compilation of some of our ideation (includes our crazy ideas as well!).



## Our voting system

(left) Our Miro voting system with the use of stickers and stars!

# Personas and User Journey Maps

After gathering insights and feedback, we created 2 personas to help us understand their pain points to better refine our solutions.

## Carol's Journey (WFH)

Carol is a new employee working from home. Throughout her day, she had the difficulties approaching her colleagues, **without knowing their availability**. She often has to wait a long time before her project manager replies to her queries.



## Tom's Journey (WFO)

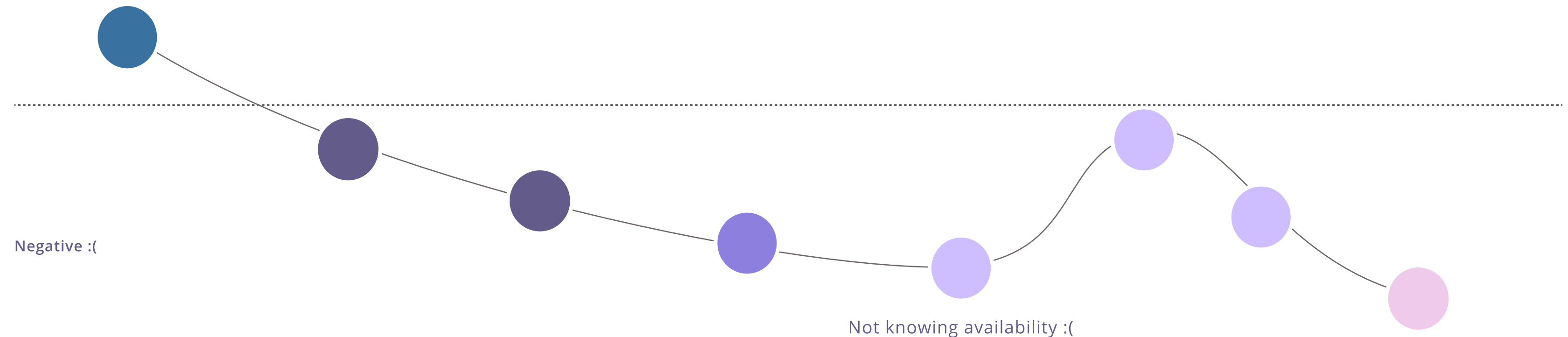
Tom is a Senior Executive who starts his day working from the office. Due to the **multiple back-to-back meetings**, he is unable to help the new-comers with their doubts, despite his role as a project manager and mentor.



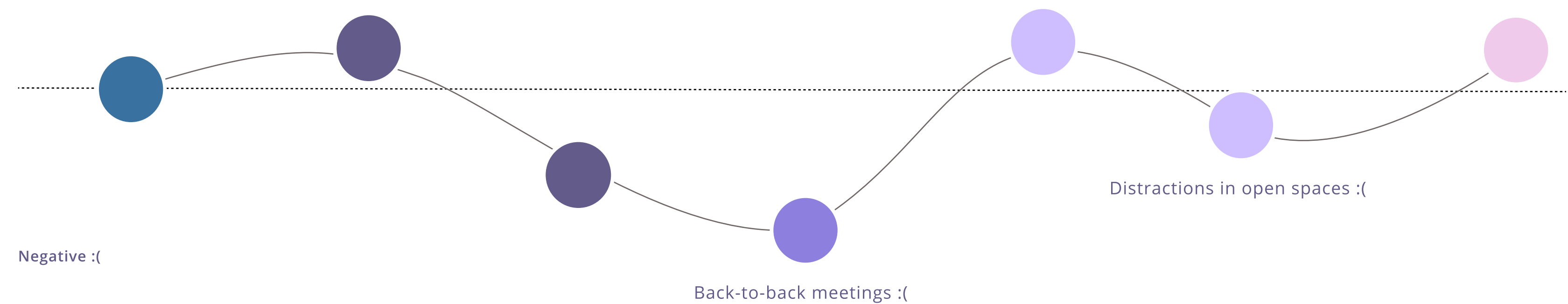
He enjoys his break times in the office as he gets to interact with his colleagues. However, the **open spaces are prone to loud conversations**, making it difficult for him to comfortably converse with his colleagues.

### Overall mood changes throughout their day

Positive :)



Positive :)





**Name:** Carol  
**Age:** 23  
**Gender:** Female  
**Family:** Single  
**Occupation:** Business Analyst

HARDWORKING

INQUISITIVE

DETAILED

## CAREFUL CAROL

“Industrious and eager to acquire more skills and knowledge.”

### BIO

Carol is a new employee in a Design firm and she is still trying to get used to the new hybrid working lifestyle. Due to lack of physical interaction, she finds it difficult to appraoch her colleagues in the hybrid work setting. Even so, she hopes to be able to more connected to the company and continues to strive for better productivity.

### LIKES

- 1. Socialising with others
- 2. Vocalising her ideas to people around her

### GOALS

- 1. Always looking to upgrade her skillset
- 2. Making sure to complete assigned tasks on time

### PAIN POINTS

- 1. Lack of understanding of work processes
- 2. Difficulty in approaching managers and colleagues

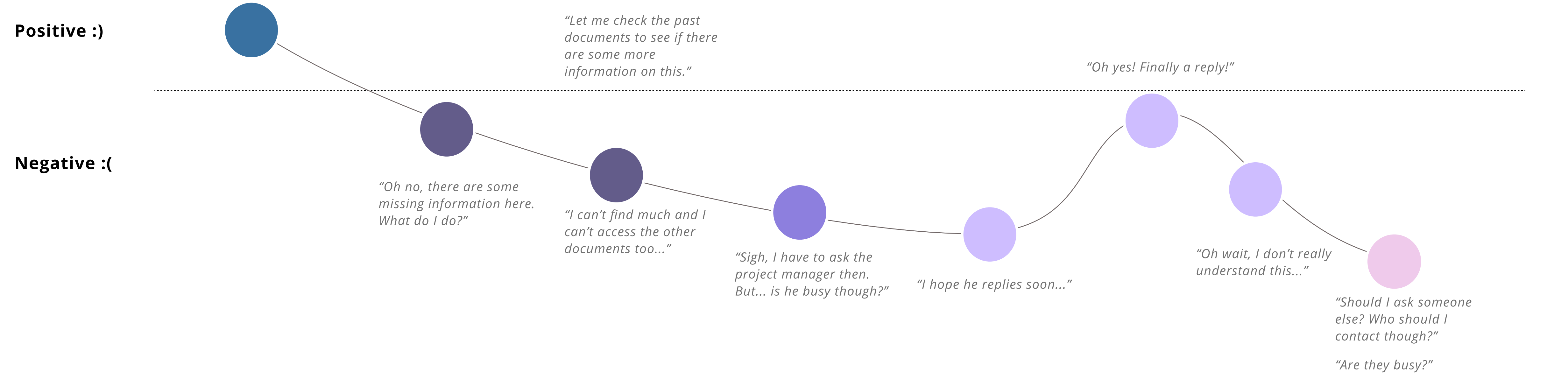
### NEEDS

- 1. Receive guidance from experienced and knowledgeable colleagues
- 2. Feel more connected to her new environment

**Scenario:** Carol is new to the company and often has doubts when she is doing her work. She wants to be able to ask for quick clarifications so that she can get back to work after clearing her doubts.



User action	Starts off doing her work, plans her scheudle for the day and checks deadlines She starts to work on her assigned tasks remotely.	She realises that there are some parts that she require assistance in and wants to clear her doubts.	She tries to figure out the problem on her own but to no avail.	As such, she proceeds to message one of her project managers to clarify her doubts.	She could only wait for the reply of the project manager before continuing with her work.	After some time, she receives a reply but she still has some questions. She replies back with more questions but due to the project manager's unavailability, she has to wait for his response.	As this cycle of waiting continues, she wants to turn to her other colleagues. However, once again, she feels disconnected with her colleagues as she does not know their availability.
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**Name:** Tom  
**Age:** 35  
**Gender:** Male  
**Family:** Family of 4  
**Occupation:** Senior Executive

- RESPONSIBLE
- EFFICIENT
- AMIABLE

TRUSTWORTHY TOM

“Many cross functional meetings - virtual and physical.”

BIO

Tom is a team project manager in a Design firm. He attends cross functional collaborations frequently with the sales and marketing departments. While juggling plenty of projects under him, he struggles to find time to mentor.

LIKES

- 1. Give guidance and advice
- 2. Connect with others closely

GOALS

- 1. Ensure team is performing at optimal levels of productivity
- 2. Strive for work-life balance

PAIN POINTS

- 1. Striking the balance between mentoring and doing individual tasks
- 2. Receiving updates from those working from home

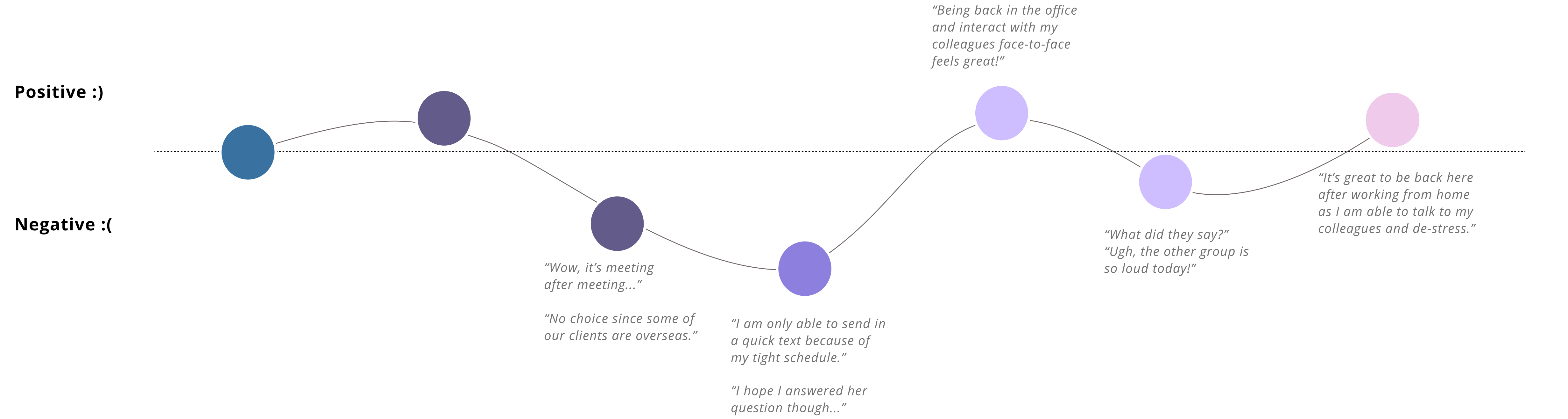
NEEDS

- 1. Effective and efficient means of communication
- 2. A comfortable environment to connect with colleagues

**Scenario:** Tom is a project manager who is working with new employees from the team. His role is the guide his members through the project. He wants to have a balance between his work and being a mentor to the new employees.



User action	Upon reaching the site, he taps the his card to enter the office.	He proceeds to look for an empty seat in the office and starts to work on his tasks.	His day consists of multiple virtual meetings which all lasted for some time, with little to no breaks in between.	After the long streak of meetings, he realised that someone on his project team tried to reach him. He was only able to reply quickly before moving on to the next meeting.	To catch a break, he goes to the pantry to grab a cup of coffee. He connects with some of his colleagues in the pantry.	Since the pantry is an open space and that there were other groups present as well, they sometimes had to move in closer to hear each other through the masks.	He goes back to his seat to continue with his tasks, occasionally turning to his colleagues for help and ideas.
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# Co.Lab

01 Semantic Map

02 Swift Call

03 UNoise

# Semantic Map

## Typology of the semantic map

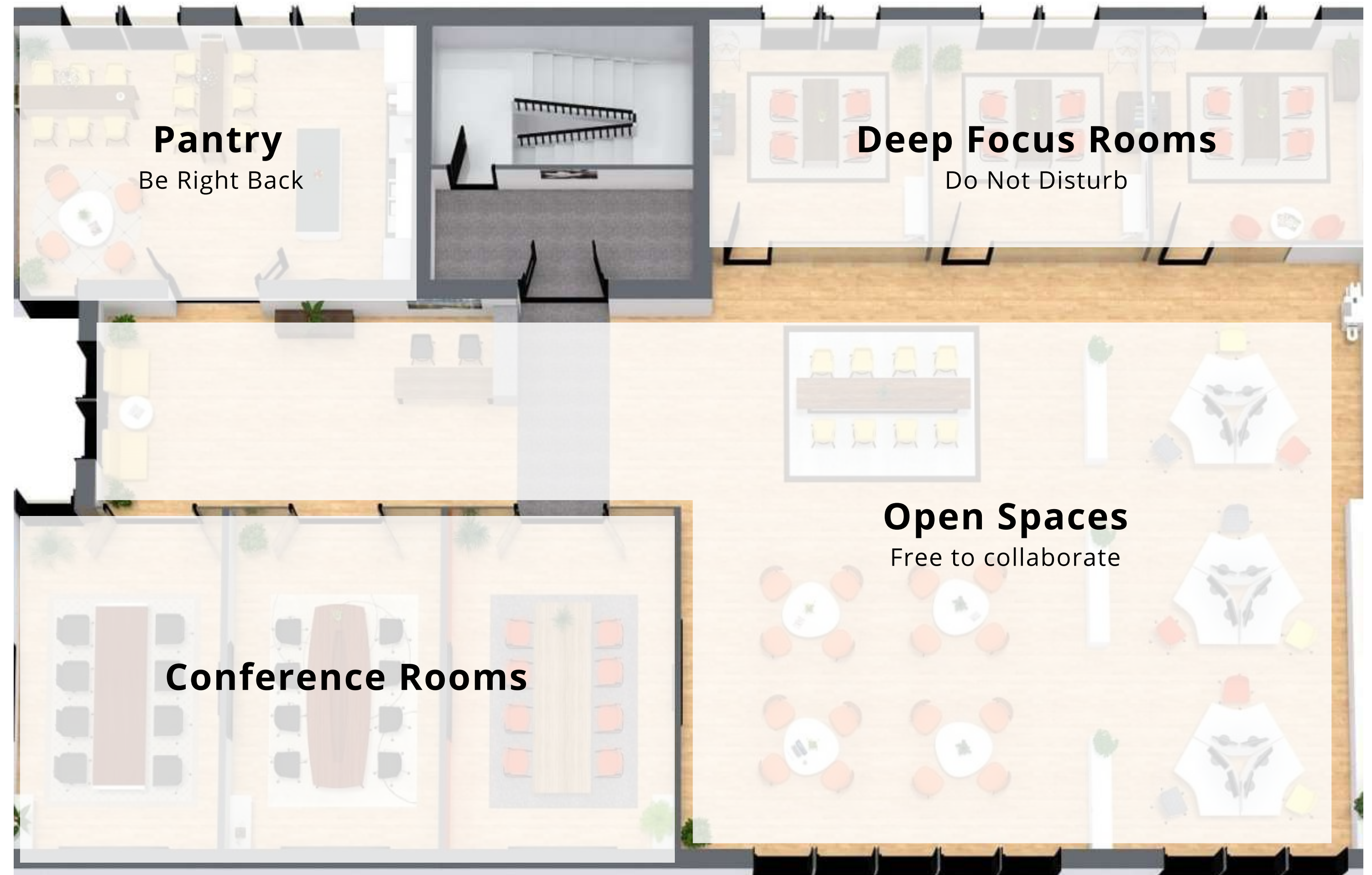
What does each area of this semantic map represent?



## Typology of the semantic map

What does each area of this semantic map represent?

- **Pantry:** Away from desks
- **Deep Focus Rooms:** Busy with individual tasks
- **Conference Rooms:** In a meeting
- **Open Spaces:** Available to collaborate



Carol ●



Tom ●

Conventional green and red indicators to represent availability.

We wanted to shift away from the conventional green and red (online and offline statuses) circles beside their profile, to provide this sense of connection to their colleagues through a virtual platform.

## Challenges we faced while creating the semantic map for our virtual platform

### 01 Live mapping

Our initial idea was to map the actual layout of the office and track the exact location of the employees who are there physically.

However, privacy was an issue and we wondered if employees would want to be tracked all the time.

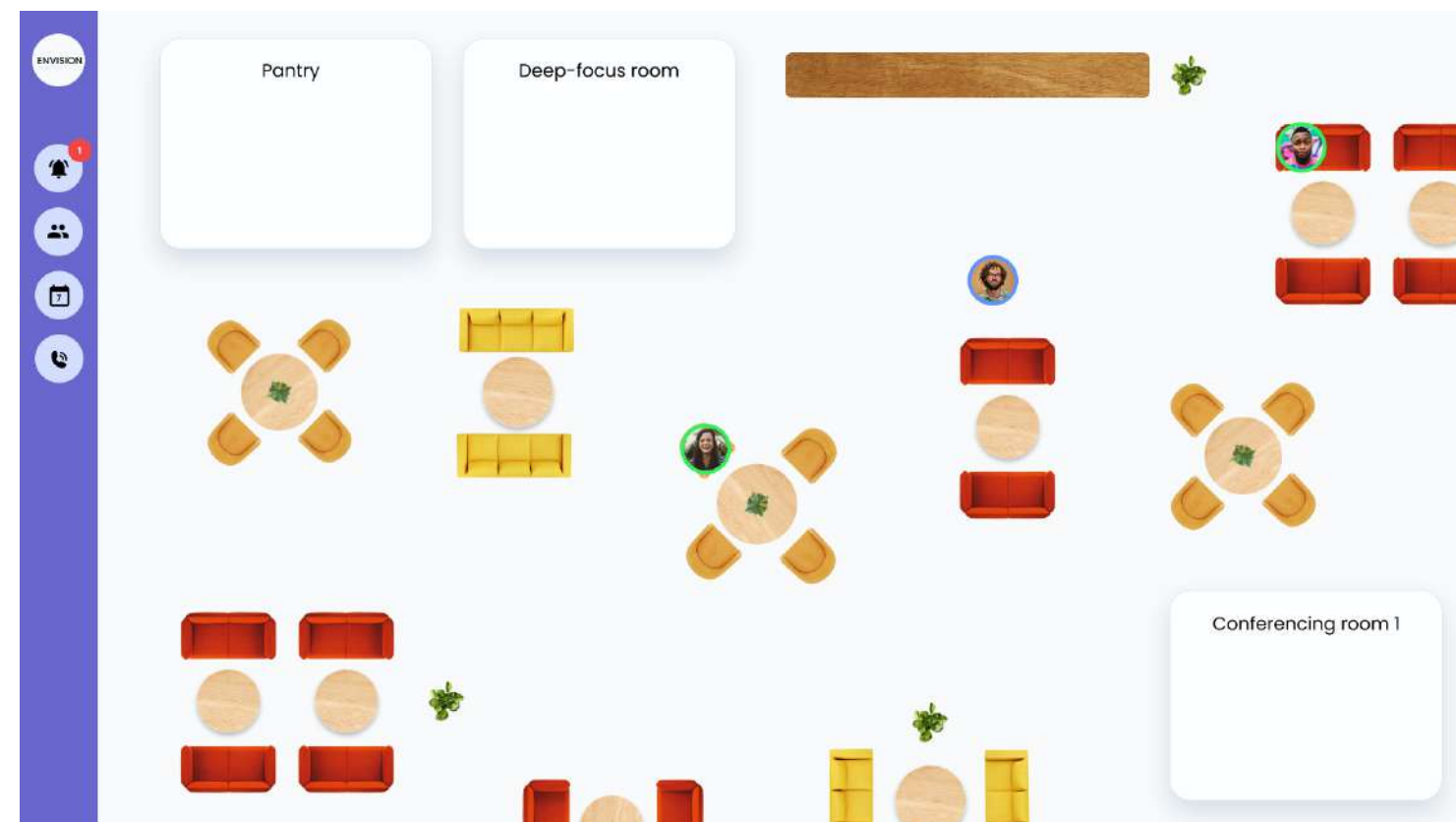
Moreover, live mapping could be costly and we wanted to see if there could be other more cost effective alternatives to show their availability statuses.

#### Live mapping

*Mapping the exact location of employees in actual layout of office*

#### Semantic mapping

*Mapping out the relative availability of based on the areas/ rooms in office that they enter*



*Our initial prototype of the virtual space.*

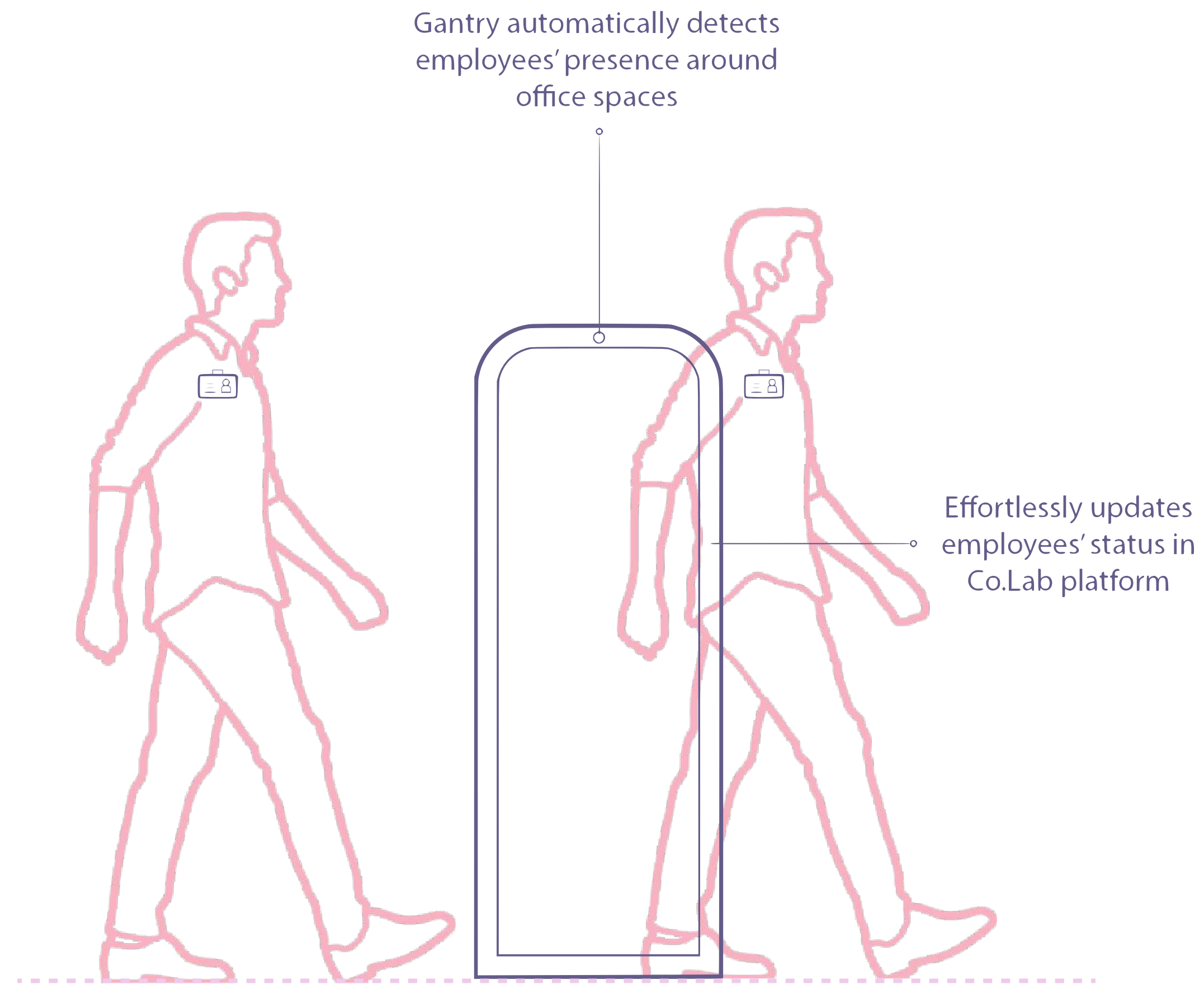


*Our subsequent prototype of the virtual space.*

### 02 Map Layout

After consultations, we figured that the layout of the map seemed rather messy as there was a mix of both physical (furnitures) and virtual elements (boxes to show quiet zones).

With the use of Roomsketcher, we managed to create layout that segregates these areas (with only physical elements) to "Do Not Disturb" zones and "Open Spaces".



*Avatar is automatically mapped out in Co.Lab.*

## Automatic mapping

Employees working in the office will not be required to manually shift their avatar around.

The physical space will be split into zones through gantries like these. When people walk past these gantries into different areas in the office, the sensor will detect their employee tag and update their status on Co.Lab. Each area or room in the office will correspond to the various areas of availability in the semantic map.

# Semantic Map + Swift Call

## How do we make use of this virtual platform?

Let's go back to the scenario where Carol has some quick clarifications that she needs to resolve.

The benefits of using the swift call come together with the use of the semantic map.

- Semantic Map: Check Availability
- Swift Call: Quick Clarifications

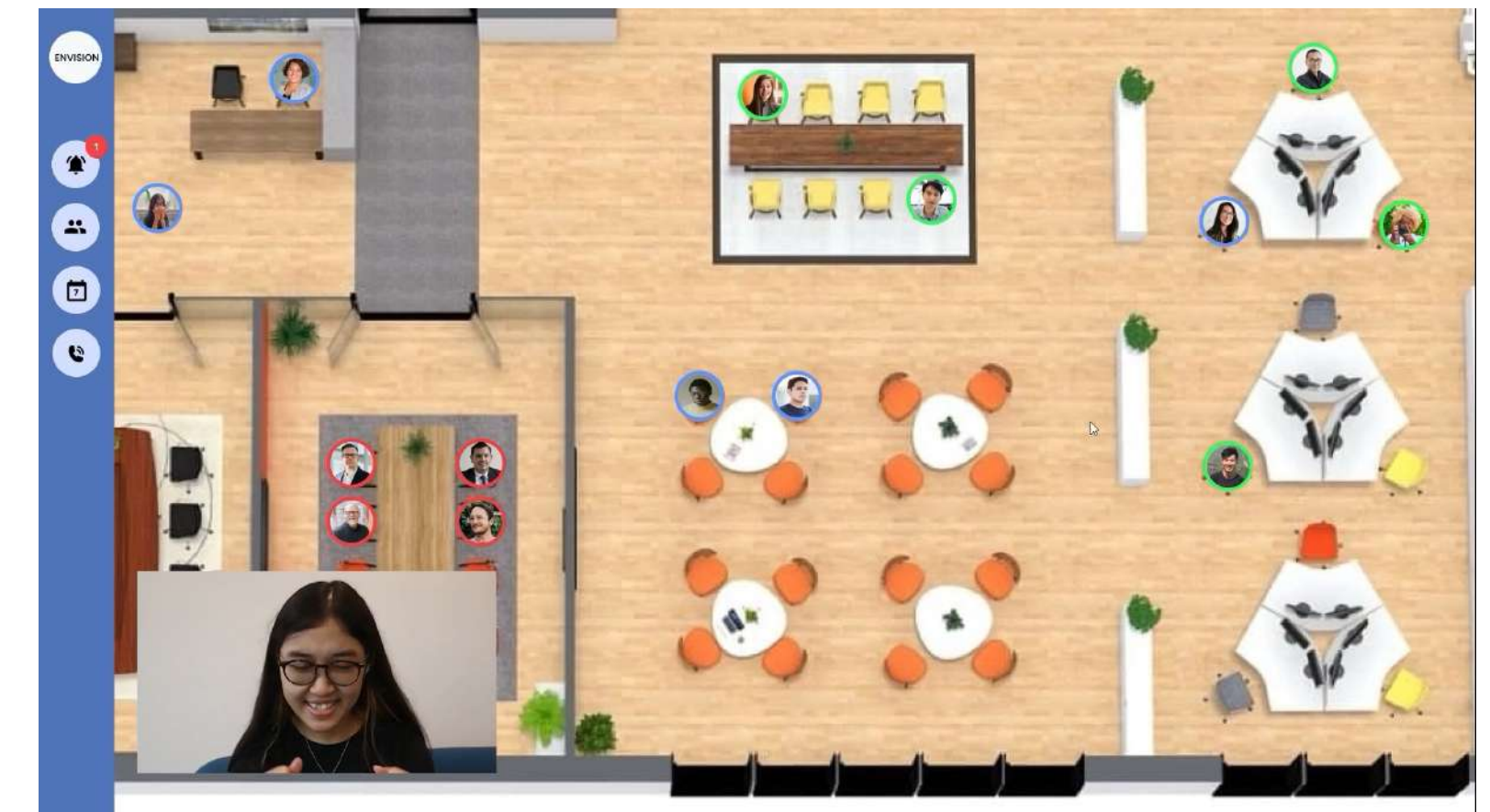
## Making use of the semantics map to check availability



**01** Carol is working from home and has some doubts about work that she wants to clear.



**02** Navigating through the semantics map in Co.Lab, she realises that one of her project manager is in a meeting.



**03** She looks for another project manager whom she can clarify her doubts from. She realises that another project manager, Jim, is available and decided to engage in a swift call with him.

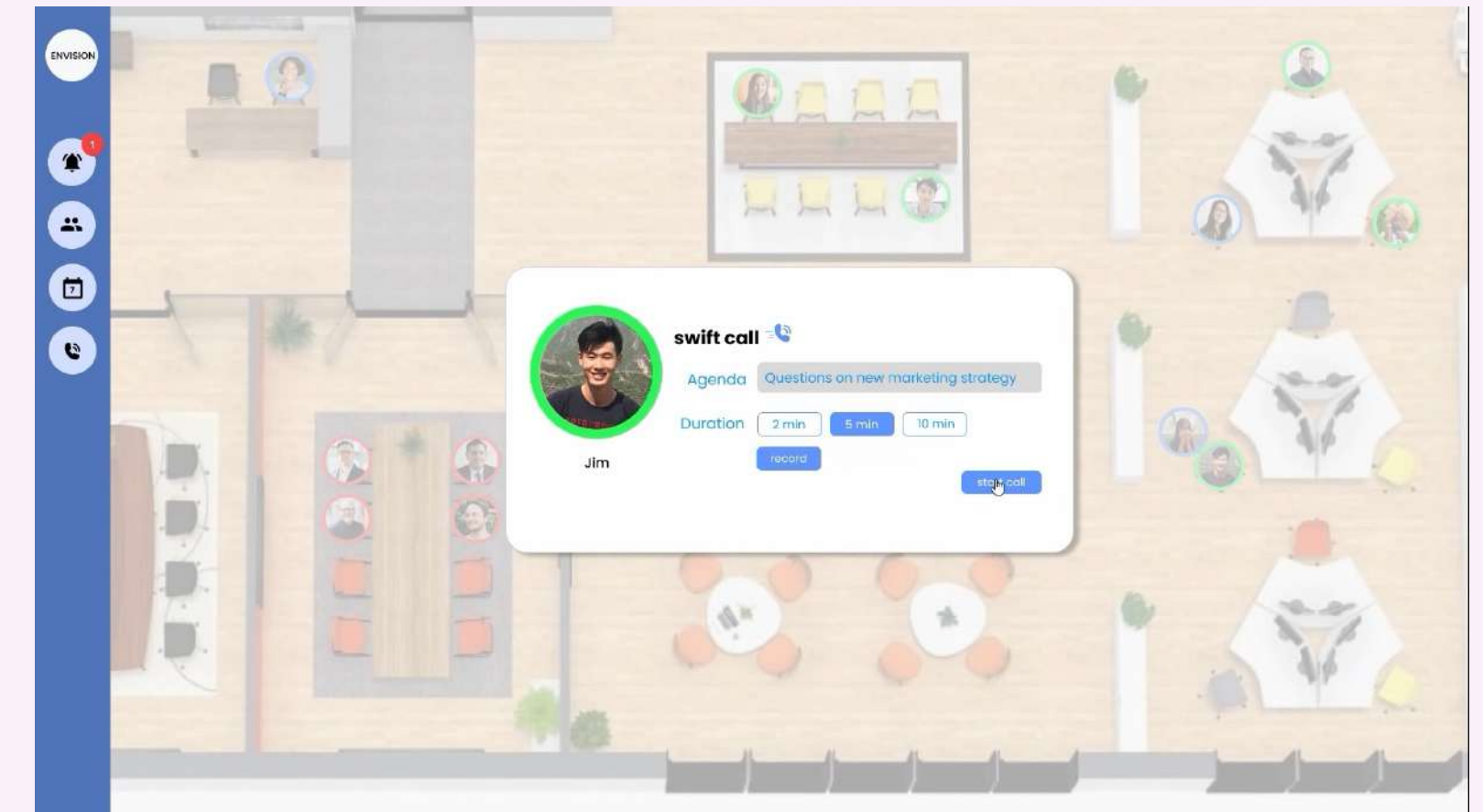
## Starting a swift call



**04** Carol clicks on Jim's avatar to start a swift call with him.

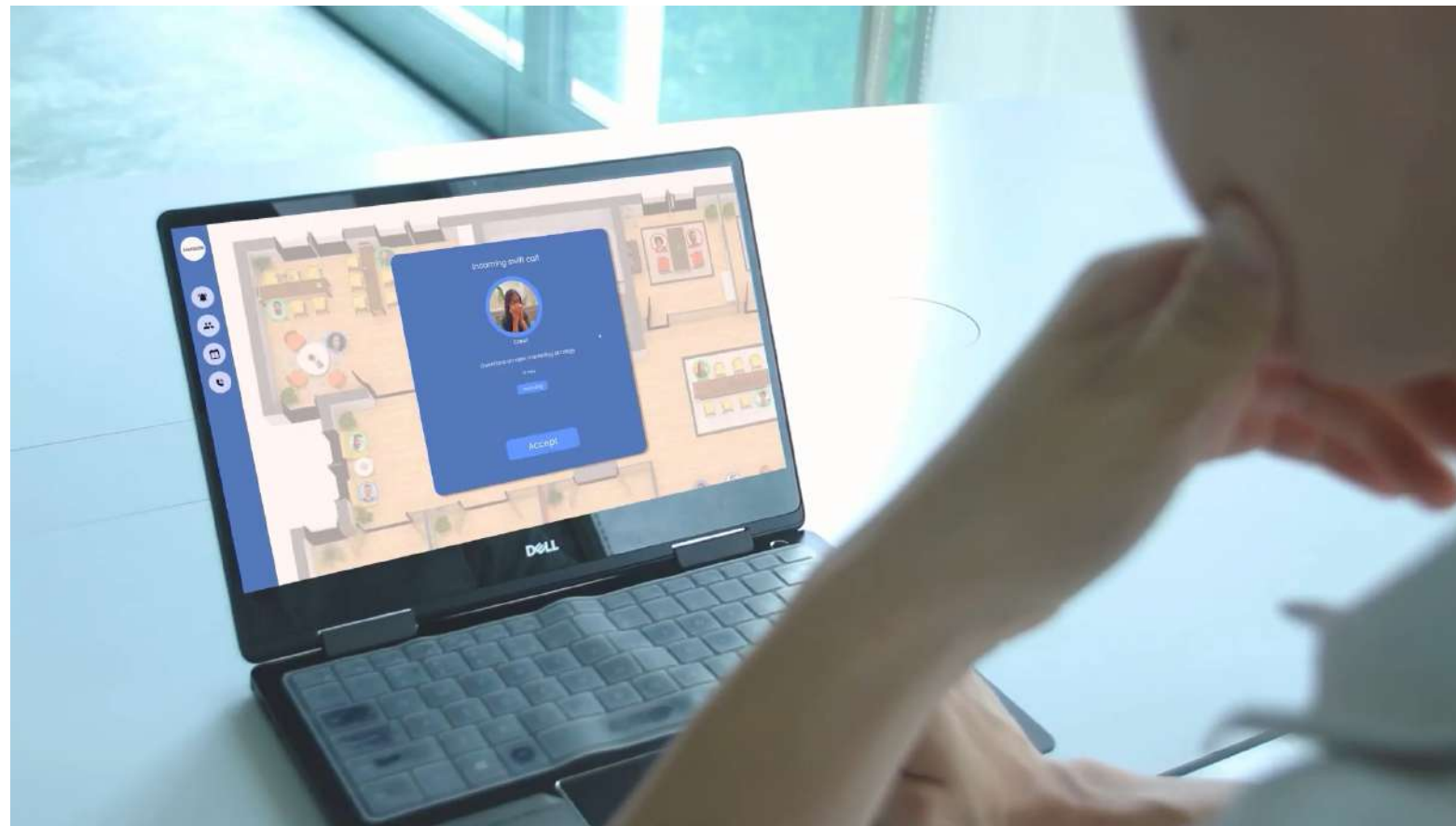


**05** She hovers over and clicks on the swift call icon. She could have opted for the message or video call option but she wanted an effective and time-saving option to resolve her doubts.

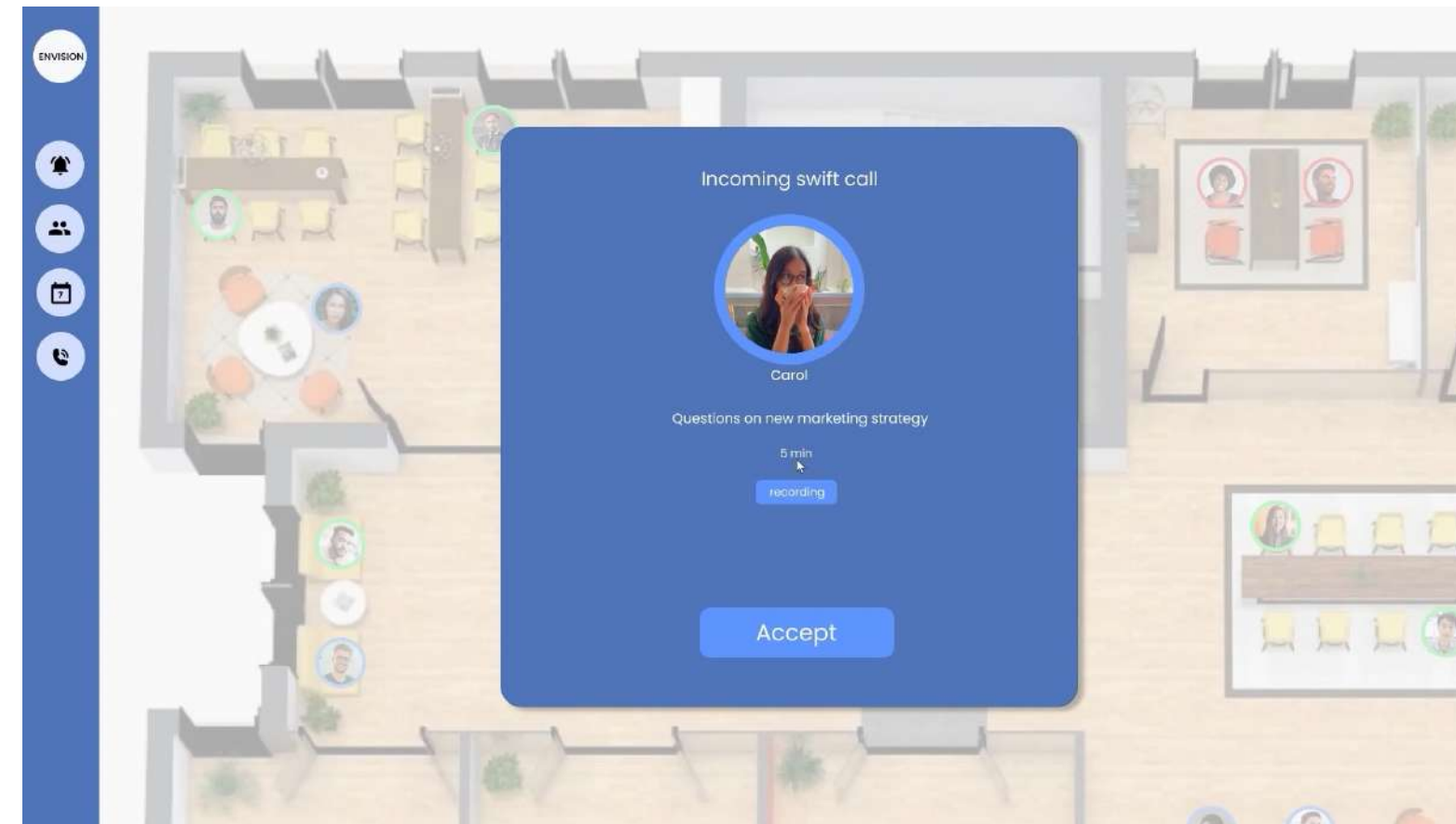


**06** Key information like agenda and duration are input to give visibility and drive effective conversation.

What about the receiver's point of view?



**07** Jim receives a swift call request from Carol.



**08** Upon seeing the Agenda and duration of the call, Jim is more inclined to accept the call.

## Receiver's POV

(left) Knowing the specific purpose and short duration of the call, Jim accepts the call to help Carol.

## After the swift call

(right) The swift call feature is beneficial for both the caller and receiver.



**09** Carol managed to glean insightful ideas from the Swift call —showing how collaboration can be prompt and effective in this digital space.



**10** After that prompt clarification, Jim is able to continue with his work before heading out for a break.

# Work Culture

Through swift calls, we want to promote the culture of mentorship and respect in the workplace.



## Caller's POV

- Be able to seek clarifications
- Make the best effort to figure out the problems first before asking
- Don't want to take up too much of the receiver's time

## Receiver's POV

- Be able to help those in need
- Get back to work quickly

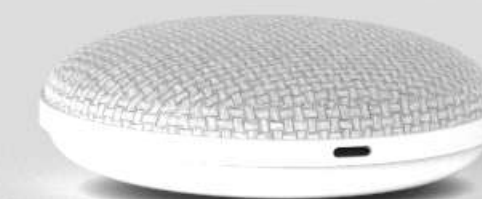
## Motivations from the caller and receiver of swift call

This motivation to use the call comes from the work culture of mentorship and respect from both the caller and the receiver.

As much as the caller does not want to take too much time from the receiver, the receiver would also want to make his best effort to help the caller so that she can quickly continue with her tasks. Building the sense of co-presence with the use of Co.Lab's virtual space will allow for more effective communication which enhances productivity.

# UNoise

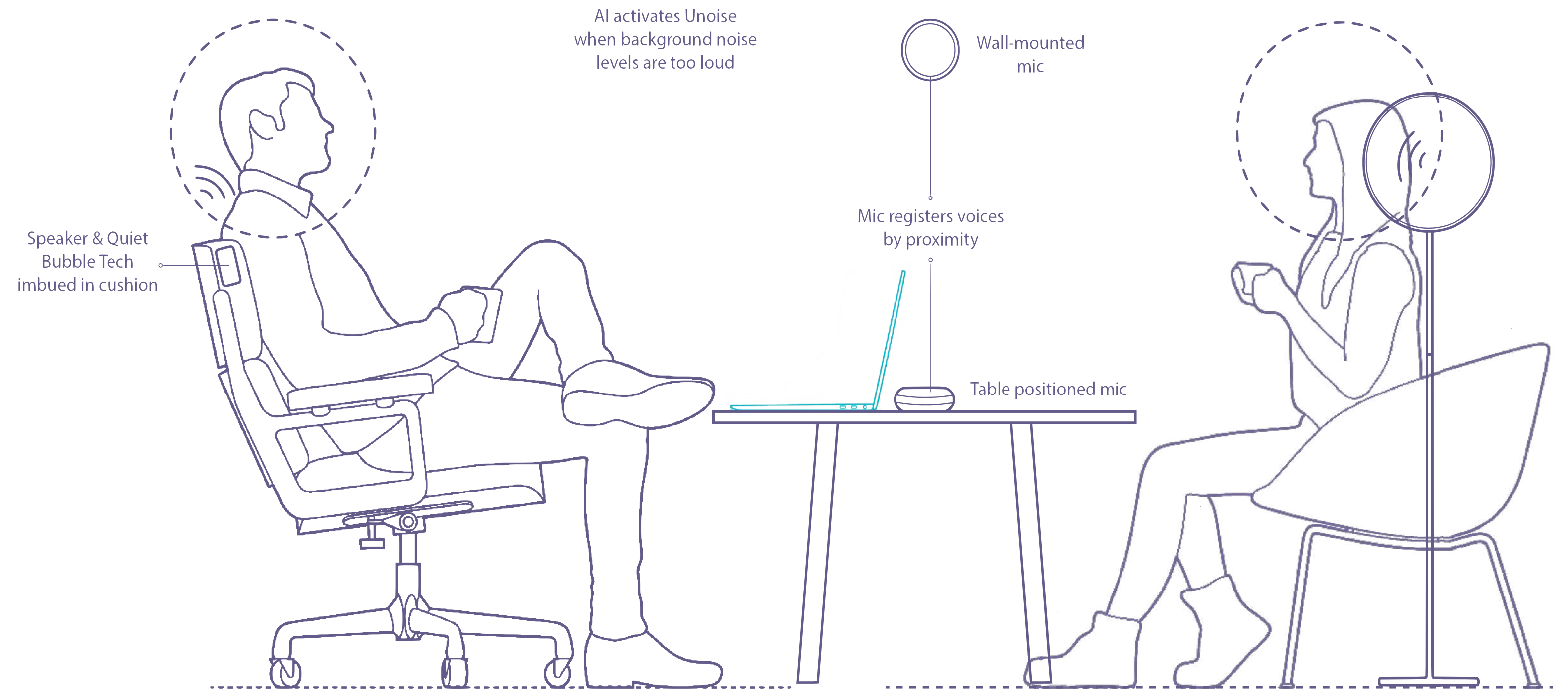
Introducing UNoise — A series of active noise cancelling systems that automatically lowers the surrounding background noises of open-spaced workplaces, reducing noisy disruptions, all while amplifying seamless conversations between hybrid work settings.



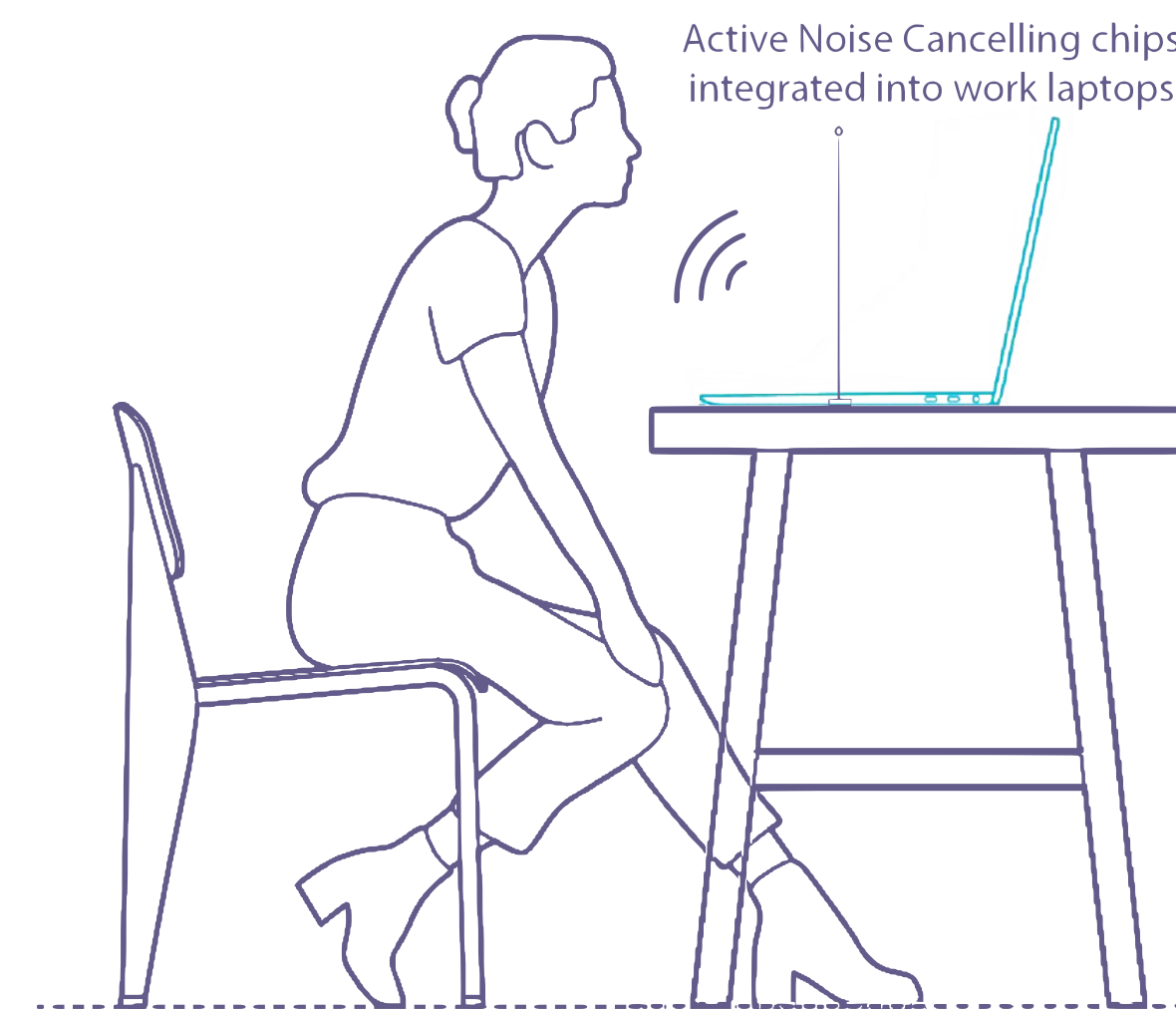
## How does UNoise work?

UNoise works like this—Omnidirectional Mics are positioned on tables or walls, registering the desired voices of those speaking in the surrounding close proximity.

The desired voices are then amplified by the speakers that are embedded into cushioned seats and stands that are positioned near the head. UNoise leverages “Quiet Bubble Technology”, from Silentium, which manipulates the air with active noise cancelling waves, creating a quiet zone within a circular proximity.

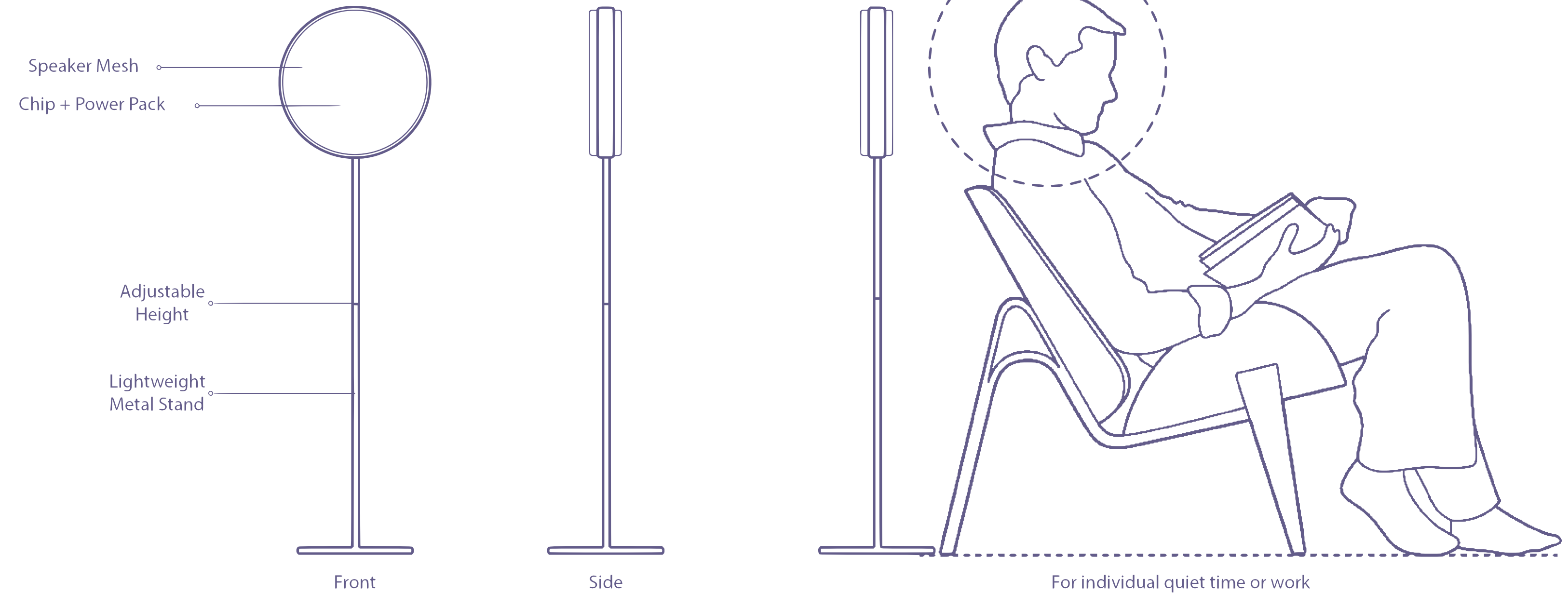


For uninterrupted collaborative discussions  
For individual quiet time or work



Hybrid Settings at Home

(left) Employees working at home can still enjoy the quietness from background noise in virtual meetings and still hear clearer conversations through the use of the active-noise cancelling chips integrated into their work laptops.



## Considerations for UNoise

*(left)* We wanted to make UNoise portable and easy for the employees to move the system around wherever they want in the office. As such, we considered using lightweight metal stand and allow for the height of the stand to be adjustable to suit everyone's preferred height.

*(right)* We also noted that some individuals prefer to work in a quiet zone and UNoise could come in handy even for them! Even in open areas, individuals can work in their bubble, with a reduction of noise distractions from these spaces.

# Evaluations



*We used our clickable prototype to test out our semantics mapping.*

## Virtual Mapping

The benefits users have found using the virtual map is the live status where it's visualisation and overview is much more effective than just displaying names on the screen, which helps to instill a sense of realness and presence in the workspace.

The live video in virtual map also encourages users to participate actively in discussions, which instills accountability in users and even increases their productivity.

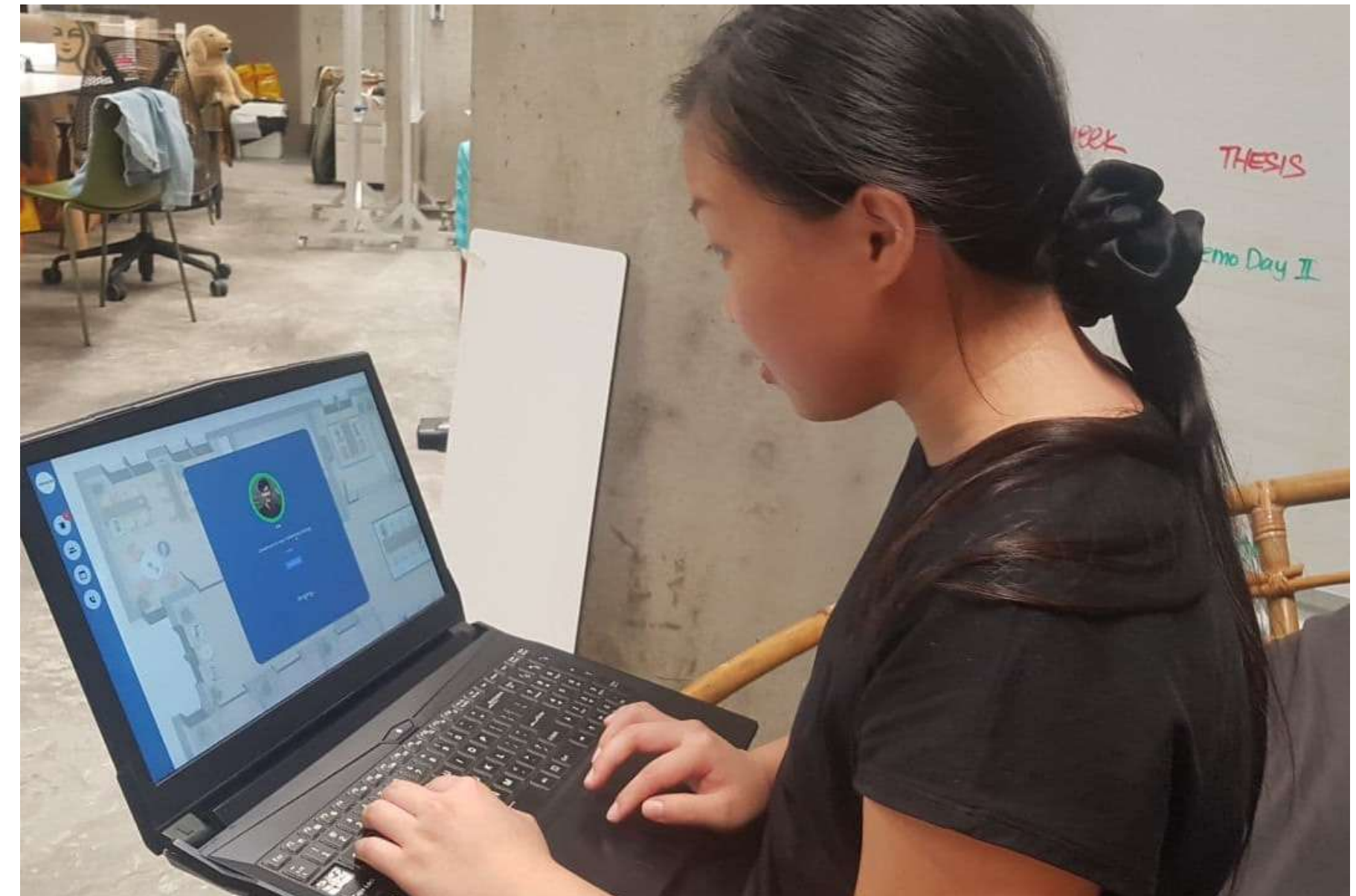
The areas to improve for virtual mapping would be to reduce the disparity between the actual location and virtual locations of users, provide private space for users who wish to view each live, and reduce the fear of micromanagement and awkwardness with the presence of live video feed.

## Swift Call

Swift call was well received by users due to its fixed-time function that respects one's own and others' time. Usage of a separate platform for work calls and displaying time and agenda of call are also deemed to be effective for users.

The areas for improvement here would be the inclusion of a short message and reminder when swift calls are cancelled or postponed.

The probable poor quality of voice recording has also been voiced out in user testing of swift call.



*We did user testing with our swift call clickable prototype.*



*We made cardboard models of the UNoise. Using speakers to emit the background noise, we lowered the noise levels when the cardboard UNoise is activated to allow for a more realistic experience.*

## UNoise

UnNoise has been proven to be effective in reducing disruptiveness of work and conversations as users are able to hear and comprehend each other better and the devices being mounted to office furniture helps to avoid hassle of carrying them around.

However, the devices being mounted to furniture results in its limited supply, hence its unavailability when all furniture is occupied in the office. Also, the devices being limited to physical workspaces causes it to be unavailable for those working remotely from the office.

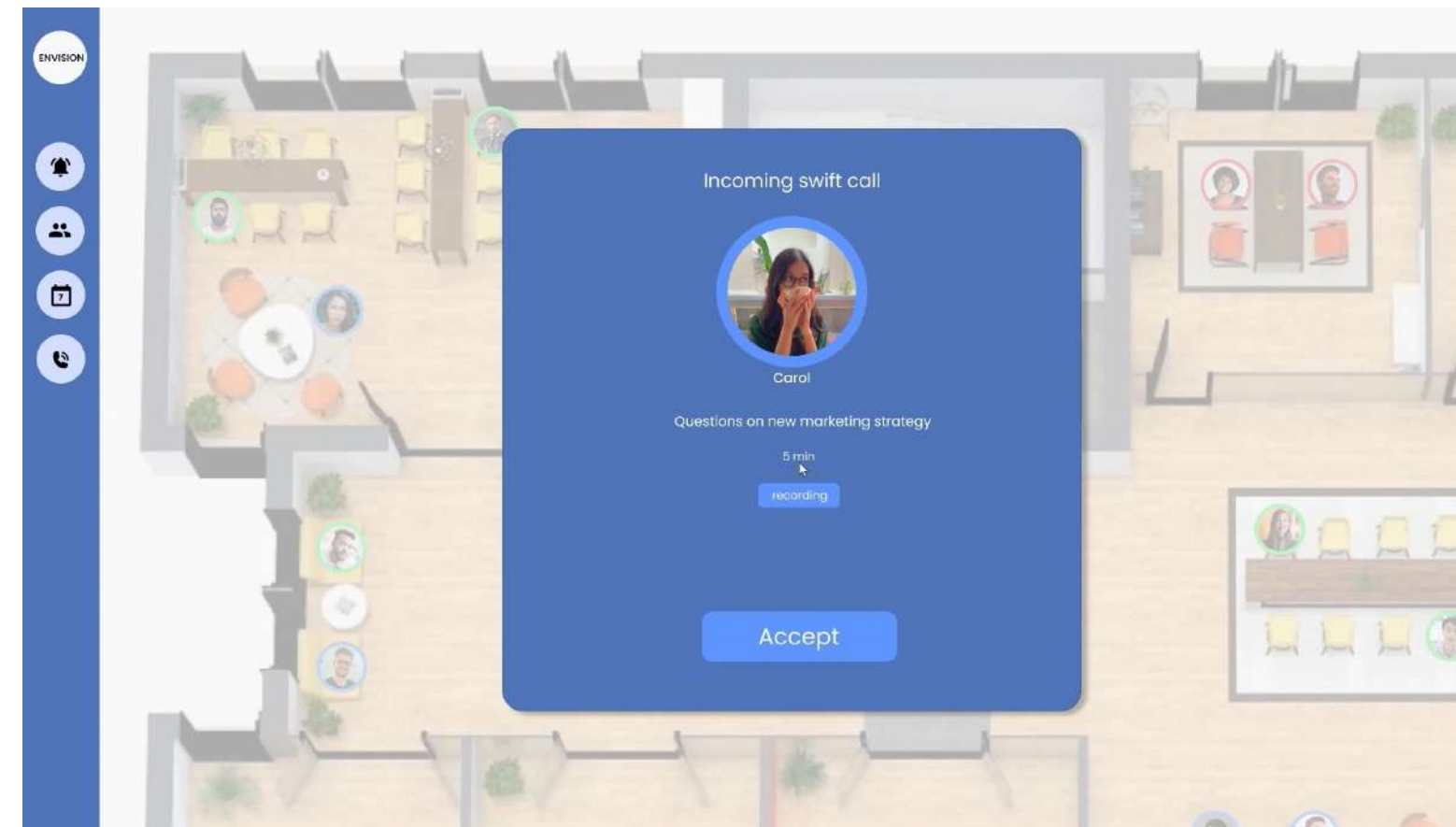
# Conclusion

$$01 + 02 + 03 = \text{Co.Lab}$$

By connecting employees through an integrated digital workspace, we want to be able to instill the feeling of co-presence regardless of work location. The use of UNoise also reduces the distractions around open spaces, allowing for more comfortable conversations to occur. We envision our solution to provide a greater collaborative environment for all employees.



01 Semantic Map



02 Swift Call



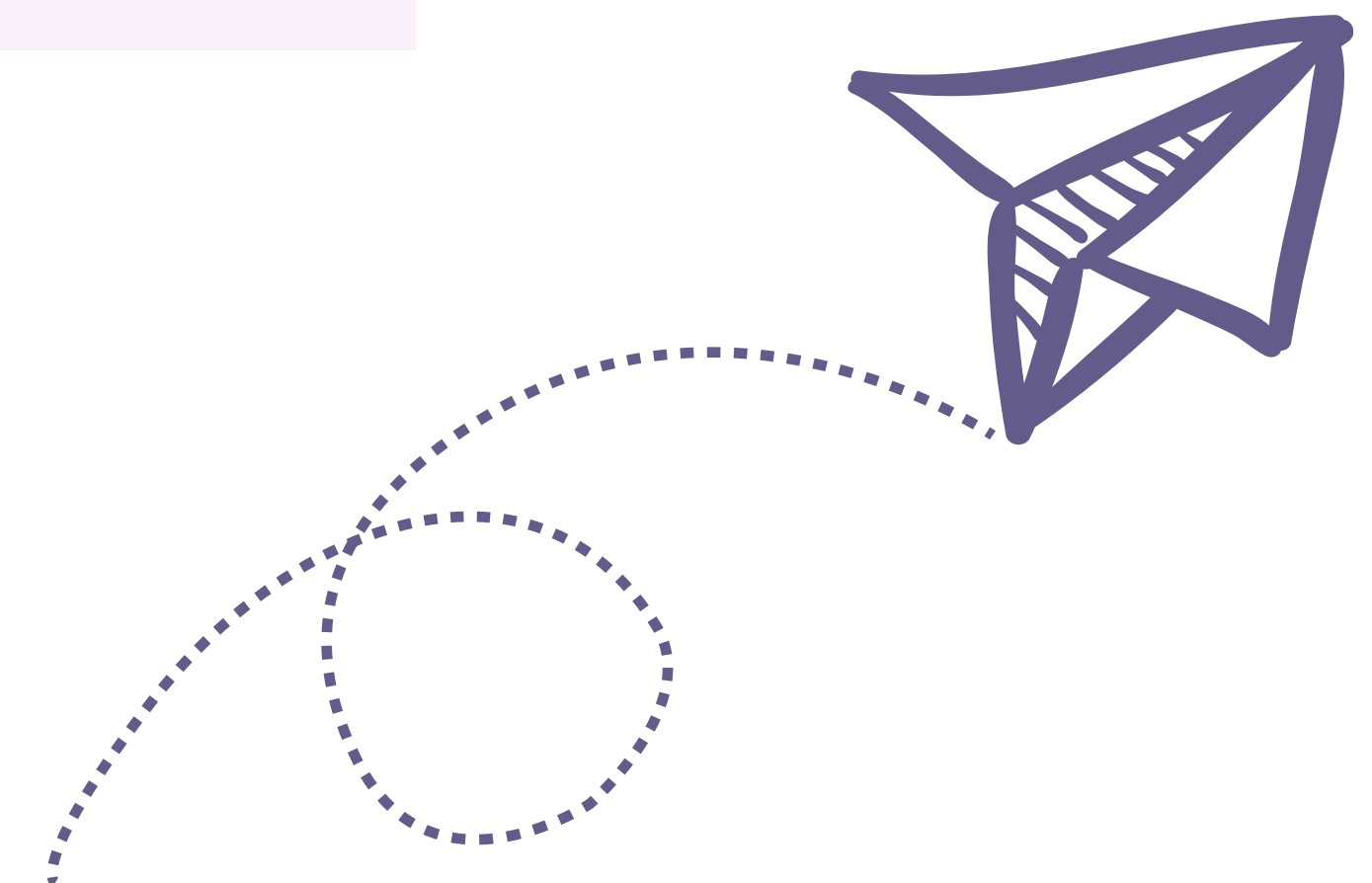
03 UNoise

# Roadmap

From the analysis of user testing, potential challenges that we foresee would be to bring more elements of physical workspaces onto the virtual platform. We intend to tackle this by capturing live gestures and rendering them into avatars.

We also aspire to provide better access to information, mentoring, and connections that were once effective on physical grounds only.

User adoption is also another challenge we envision, but we intend to address it by providing users options to toggle their interface and choose their preferred gamified platform to instill a sense of individuality within co-presence. We perceive these challenges to be avenues for future works that will further enhance the effectiveness of our co-presence theme.



# Working in TD Teams



Complex problems like envisioning the future of work definitely require a team with diverse fields of knowledge, expertise and experiences. However, whether we could amalgamate our different domains of knowledge while navigating through an ambiguous project with so many variables to consider was another question in itself.

## **Application of disciplinary knowledge**

At times, complementing skillsets allowed us condense research, data and speculations about what future workspaces will require. We were then able to set clearer parameters to drive insightful discussions that eventually led to the development of our core concept— copresence. Brandon and Chelsea were good at facilitating brainstorming sessions and driving discussion using the design thinking process, while Huanzhang offered his expertise in synthesising research and deriving insights from interviews and surveys. Teja leveraged on her expertise in product engineering and assisted in terms of clarifying the use cases of our solutions.

## **Methods used**

- Stakeholder analysis
- Journey Mapping
- Personas
- Affinity mapping
- User testing



## Reflection

However, the benefit of complementary skillsets across different domains of knowledge did not always materialise. There were times where we all felt lost amidst the uncertainty of what our final concept should look like. At first, we wanted to ground our features and solutions with data that strongly supports its use case. This led to a preliminary elimination of many ideas that are useful in theory but lacked supporting empirical data. For instance,

Some of our preliminary solutions also align with Johnson Controls' vision of future workspaces - leveraging technology and data to augment our experience with the built environment. Our very first idea was a living dome - where we could customise lighting, sound and scent to suit the ambience of a work pod to employees' individual preferences. However, we could not find a strong causal link between such customisations and our key project goals of enhancing collaboration, sustainability and wellness.

After weeks of consultations, we realised that our approach of designing solutions with strong use cases before forming a narrative of what our future of work looks like is too challenging. We focused too much on the function of our individual solutions and neglected creating a coherent story to convince the panel about our concept.

In retrospect, it would have been more realistic if we had identified a core concept earlier - one that is backed by data and research. Thereafter, the solutions revolving around this concept need not be perfect — it will be too ambitious to strive for complete, developed solutions while ensuring our other deliverables like the video, presentation and report are completed on time.

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**fin.**