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## Abstract

This paper explores the potential of spatial atmosphere as the basis of a coffee stall design, creating an intimate understanding of the possible sensory transactions that occurred throughout the coffee-brewing process. In this reflective piece, a coffee stall design process is presented and dissected to unveil the programmatic basis of the design. A closer look at multi-sensory experiences that include sight, smell, and sound in the process of brewing is considered essential. They hold a significant role in perceiving the surrounding atmosphere and how it impacts our design process. A series of equipment and ingredient tracing is conducted to identify the optimal barista's workflow and the production of a multi-sensory experience, rethinking the purpose of the surrounding objects from two different perspectives. Such a process positioned the atmosphere exploration as a focus in achieving a unique programme where the objects within the coffee-making process generate the space through materiality and immateriality.

*Keywords:* atmosphere, sensory experience, system of objects, immateriality

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### **On the atmospheric architecture**

The character of a space or place is not merely a visual quality, as is usually assumed. The judgement of environmental character is a complex fusion of countless factors that are immediately and synthetically grasped as an overall atmosphere, feeling, mood, or ambience. (Pallasmaa, 2014, p. 19)

This paper explores the notion of architectural design as a mindful atmospheric creation that goes beyond the visual quality. Pallasmaa (2014), in his piece titled *Space, Place, and Atmosphere: Peripheral Perception in Existential Experience*, highlighted such a thought, arguing that it is the atmosphere that allows the space to invite and suggest us in engaging with the activities. In particular, Pallasmaa (2014) positioned atmosphere as "the overarching perceptual, sensory, and emotive impression of a space, setting, or social situation" (p. 20). It is an amalgamation of sensorial experiences that relate to one another (Pallasmaa, 2012), through which one could establish a relationship with their surroundings: the environment, other people, and objects (Böhme, 2017). In other words, the atmosphere countenances us in spatialising the space and making the architecture work. This paper would like to highlight such thinking by reflecting on how we designed a coffee-making space for our client in 2020.

The design process puts atmosphere as a disembarking point for us in creating the spatial programme of the coffee stall, taking a position on creating the multi-sensory experiences that incorporate sight, smell, and sound. While sight has predominantly affected the way we practise architecture today, architecture that considers how the other senses are considered in the design is still rarely discussed (Spence, 2020). Spence (2020) further suggested that, at times, other non-visual qualities present in space make the *image* of the space vivid to us, such as odour. Our design put forward such a belief, arguing that for a coffee-making space, it is the *other* senses that we must greatly deliberate over.

Another point that we draw in our paper is how an atmosphere-centred design does not necessarily neglect the functional aspect of the architecture. Instead, we found that the celebration of atmosphere brings us to a unique programme, where the architectural elements and objects are distinctively related. We can see the space as a distributed system, where the objects enable reciprocal relations among them (Baudrillard, 1996). In this case, the object's interaction produces a series of sensory experiences, stimulating our senses and generating the atmosphere itself. Also, in the design process, we highly regarded the client's participation that demonstrates what coffee making is for them. Such an approach placed the design as emerging from the architect and the users (Hill, 2003). Thus, our design is, by all means, *our* design.

### **On the brewing process**

The current Third Wave coffee era requires more than our taste buds to enjoy the delicacy. Historically, while the First

Wave enable coffee for mass consumption and the Second Wave era focuses on coffee as a social experience ("Waves of coffee," 2019), in the Third Wave era consumers are getting more interested in the coffee itself, any information about the origins of the beans, process, and brewing method becomes essential for them to indulge their coffee. As if the taste alone is not enough, they seek a complete narrative from the coffee to fulfil their curiosity. With a wide variety of high-quality coffee across our country, this story can be seen as a massive opportunity to expose Indonesia's cultural richness.

Towards these visions, manual brew techniques have been greatly appreciated. Such coffee brewing techniques provide a bigger room to explore the indigenoussness of the local coffee flavour compared to a coffee machine. These methods have a unique attraction to the customers, giving them the qualities to become a part of a significant identity. Manual brew techniques have become essential, especially for small-mid coffee businesses, because coffee machine techniques are more prevalent in large-scale coffee businesses with up to hundreds of customers each day within the rising coffee consumption in the last five years (Widiarini, 2019). On top of that, manual brew techniques such as French Press, V60, Aeropress, Syphon, and Cold Brew are in demand since they produce more prosperous and vibrant tastes ("Apa itu seduh," 2018; Sulaiman & Nodia, 2018). Further, these techniques could alter the coffee flavours as wanted, such as the Cold Brew technique was applied to produce a smoother cold coffee taste. Despite its longer production time, manual brew techniques make the flavour more long-lasting than using a coffee machine, allowing us to enjoy the coffee while relaxing (Sulaiman & Nodia, 2018).

Since unveiling our local coffee richness is our primary objective, we believe that ergonomics alone would not be enough to produce an optimal coffee stall design. We feel that two-way communication between the barista and customer is compulsory to acknowledge this local indigenous delicacy with so much potential to explore. Especially with manual brew technique attraction in the making process, the customer needs to enjoy the whole sensory experience to understand the coffee itself better. Therefore, to achieve those specific qualities, where a sensory transaction could open up a dialogue, we tried to position ourselves in two different perspectives within the stall, which are as a barista and a customer. In these two roles, we perceived the surrounding object differently, as a functional operation and a narrative instrument to generate a sensory experience.

#### **On the narrative: The BEEU Coffee**

BEEU Coffee owner is our client and the person who opened up our eyes about the delicacy of experiencing our local coffee. BEEU Coffee owns a small-scale coffee stall that popularises Indonesian local coffee beans with various manual brew techniques in our campus, Faculty of Engineering Universitas Indonesia. Based on our observations and a series of interviews, we could say that their passion for sharing the story of the coffee

sets them apart from other typical coffee stalls. Within their belief in Indonesian local coffee high qualities, they often feel responsible for informing customers about how their coffees are made, from their origins to a single cup of delicacy. They want the customers to feel included in the process by exposing their workflow, showing the manoeuvre of the manual brew equipment and ingredients, while also popping up a dialogue between them. It feels like the BEEU Coffee commodities are not limited to their coffees, but a story that comes in a whole package of a making process, dialogue and the coffee as the final product to be experienced by their customers.

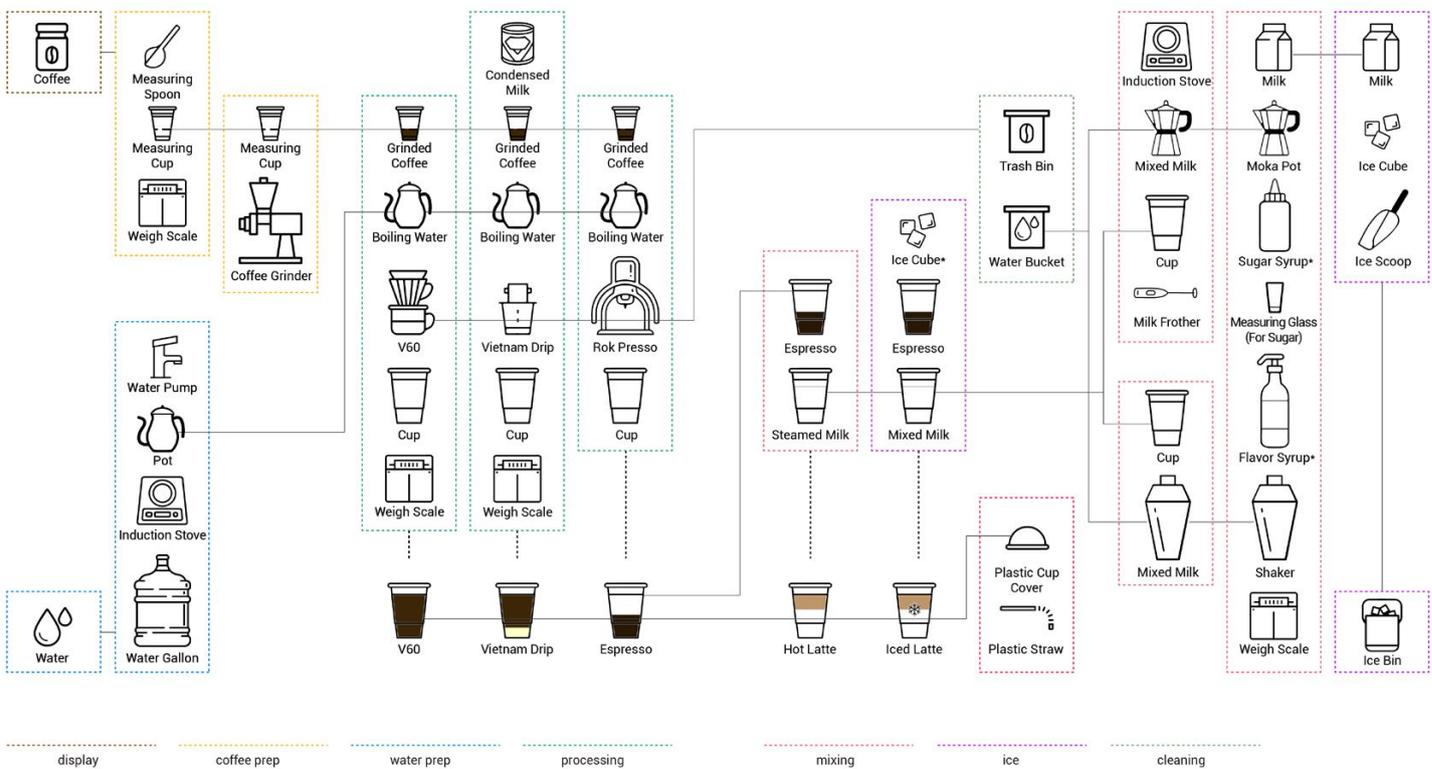
The story began when we, as customers, began experiencing the available coffee bean variants since they tend to change the variety over time. The owners would encourage us to recognise the difference from each variant by capturing the aroma or even tasting the flavour of the bean. While selecting, BEEU Coffee hinted at the prologue of the story by opening a dialogue about the origins of the coffee variants—the roasting profile, the process, the hint of flavours and the origin location. From there, the owner would recommend which manual brew technique is more suitable for crafting the desired flavour, giving us a brief explanation of each method's result. After the desired flavour is determined, the barista would start filling up their gooseneck kettle with water and heating it with a conduction stove while measuring the selected beans before grinding it with the coffee grinder. We can hear the water is flowing, the stove beeping, and the blade is crushing as part of the process, indicating other involved components and a transformation of the coffee itself from its previous form. After the coffee and water preparation are done, the baristas would take us to the processing phase, showing us how the manual brew techniques are done through the equipment. This visual attraction slowly transforms into an overflowing olfactory experience when the boiling water starts to integrate with the ground coffee. We can feel an intense aroma spreading around us from the evaporation process. With the coffee within our grasp, the scent becomes more robust. Finally, we can taste the final product after experiencing the whole story as a way to enjoy our local treasure.

### **On the sensorial transactions**

After experiencing the coffee-brewing story ourselves, we realised that the equipment and ingredients involved as objects are essential to keeping this narrative alive, generating the overall atmosphere of the coffee stall itself. Interaction between the different senses, specifically those of taste and smell, occurs every time we drink, with levels of each interaction that increase the gustatory intensity of the other (Henshaw, 2014). From a barista perspective, the objects correspond to a sense of operation (Baudrillard, 1996), generating a particular workflow on their making process. The operating workflow of the objects potentially produced various sensory experiences, narrating an intriguing process, and sparking a potential dialogue between customer and barista or another customer, thus creating a

particular atmosphere within the story. In doing so, the objects help us measure the dimension needed as an ergonomics factor, pushing the design further to beyond ergonomics as a narrative instrument.

The first thing we did in positioning ourselves as a researcher was to analyse each step in the coffee-making process, acknowledging the potential of materiality and immateriality. We started with equipment and ingredients tracing, breaking down the operation by investigating each component involved in the coffee-making process from BEEU Coffee signature: V60 drip, Vietnamese drip, Espresso, Hot Latte, and Iced Latte. From there, we identified the active components for each corresponding menu from scratch. There are 29 different kinds of objects that are used to produce the signature coffee. Some elements, such as water gallon, trash bin, and induction stove, are hidden beneath the working surface or behind other objects. In contrast, other things like manual brew equipment and coffee are directly exposed to the customer's eye.



We analysed the barista's workflow and grouped the objects based on their function following the tracing process (see Figure 1). The object groups were divided into seven categories to execute specific tasks in the coffee-making process: display, coffee preparation, water preparation, processing, mixing, ice, and cleaning. The coffee display allows the customers to observe and select the coffee, while the coffee preparation refers to the process of measuring and grinding, as well as boiling the water. Coffee processing is the stage where most of the coffee transformation happens through manual brew equipment.

Figure 1. Objects as an operation in coffee-making process

Mixing, putting ice, and cleaning are other processes aimed to add a different flavour to the coffee, maintaining some ingredients and altering the temperature, apart from taking care of the waste and the hygiene, in respective order. The coffee-making process creates a complex system where the objects are intertwined, performing an operation and creating an atmosphere around the coffee stall. Inside this system, some objects manoeuvre between several groups because of their multiple tasks in the whole process. For example, the most noticeable objects manoeuvre can be seen where the gooseneck kettle is used to both boils the water and pour the ground coffee in processing, acting as a double agent in the water preparation and processing department. From there, we were able to visualise the potential workflow for the barista within the coffee stall.

On the other side of the coffee stall from the customer's point of view, this group of objects are perceived differently. Rather than as a production unit, we tend to see it as a narrative instrument, actively stimulating our senses throughout the story, raising our curiosity to make a dialogue with the barista or other customer. The complexity of the whole experience depends on our interpretation of what is present and absent (Hill, 2006). It is replete with juxtapositions of our senses (Hill, 2006). The atmosphere is not experienced as a whole but piece by piece (Hill, 2006). For instance, as shown in Figure 2, when we ordered the V60 drip, we started a sensory transaction by seeing, smelling and tasting the coffee beans. Such transaction is crucial for the customers since the scent has unique qualities; it is ubiquitous, persistent and it has an unparalleled connection to our memory (Henshaw, 2014).

Furthermore, Henshaw (2014) mentioned that once some odours have been detected and identified, sometimes without any conscious thought process, our body adapts and habituates to those smells, building up a solid sensory experience as the atmosphere starts to generate. At the same time as experiencing the initial smells of the coffee stall, the barista gave us a response in the form of a dialogue, explaining the difference between the variants. We can recall this story even after a long time by associating the narratives as a memory with the coffee's aroma since a sense of smell produces more long-lasting memories than the others (Dove in Henshaw, 2014, p.31). After selecting the beans, the barista took the chosen beans to preparation while also preparing the boiling water. Our olfactory experience started to shift into an audio experience when the coffee was grounded, the water filled up the kettle, and the induction stove and weight scale were beeping. Visual and aural perception are complementary systems that fit together (Hill, 2006). Even if we could not see all the objects during that time, the sounds informed us that a transformation was occurring. The coffee texture was changing, and the water temperature was rising through an accurate measurement in the process. It intrigued us to ask questions towards the barista about what was happening, why they did that, and so forth, expanding the dialogue further.

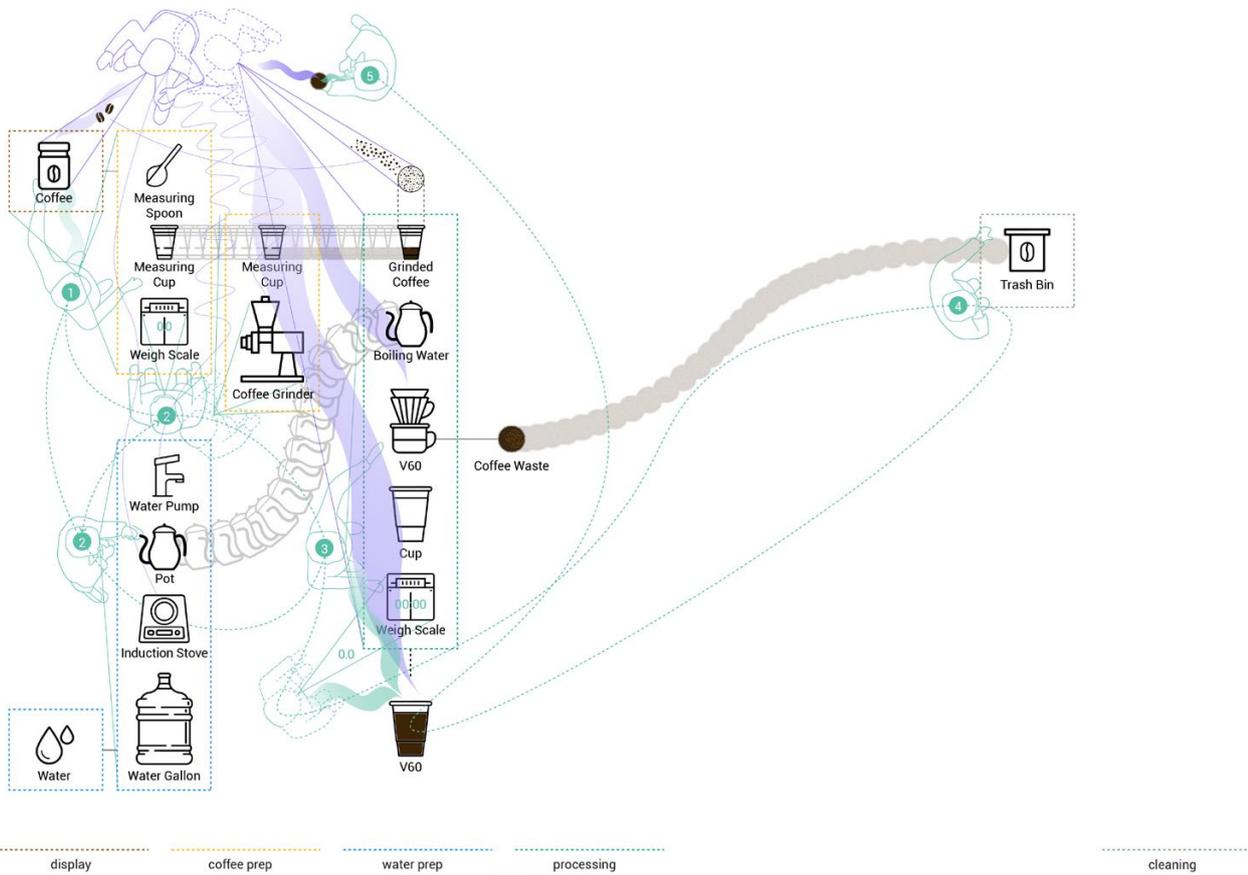
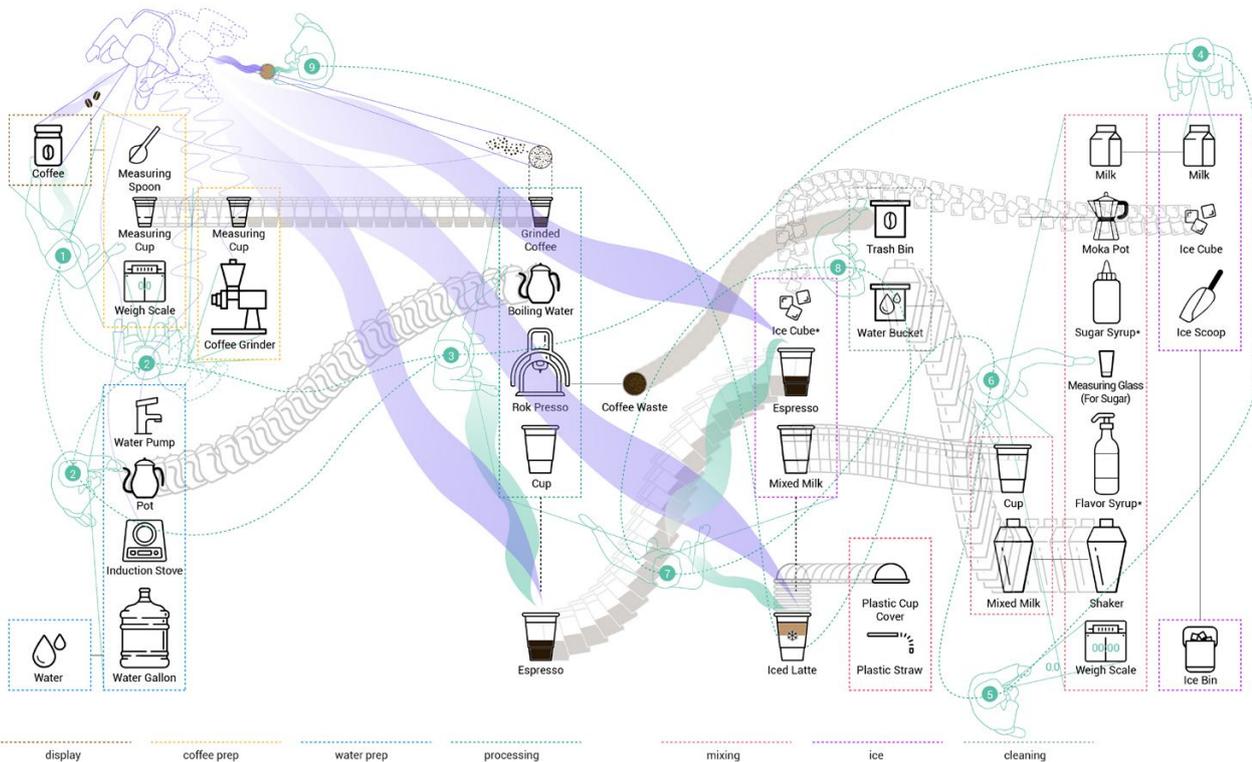


Figure 2. Story of V60

In the next phase, the barista would take us to various sensory experiences in the form of sight, smell, and taste. After the coffee and water preparation are done, the V60 dripper was placed in front of us. We saw the barista place the ground coffee on top of a V60 paper filter within the dripper, portraying a layer of transformation to our eyes. Once the barista started pouring the boiling water into the coffee, we could see the vapour spreading around us, creating an intense, vibrant aroma while we smelled it. The presence of water vapour is vital in our smell perception because it influences nasal mucus, which is required to dissolve odours and transfer information about smells to the olfactory receptors (Henshaw, 2014). It feels like we can see the scent within the air, heightening our senses (Wagenfeld, 2008). Then, when the water started integrating with the ground coffee, an elegant clear dark brown colour at the bottom of the layer slowly built up. Within 3 minutes, the aroma became more robust as the clear dark brown colour filled the cup while also intriguing ourselves or other customers. Finally, after putting the coffee waste in the trash bin, the barista brought us to the climax of the story, the tasting experience. After a series of sensory and dialogue transactions, we could taste the delicacy as a complete sensory experience while continuing the conversation with the barista for further potential flavour exploration.

In other examples of coffee-making techniques involving more objects than the V60, such as the process of making an iced latte, the sensory transaction gets more complex with

the mixing process and ice-related components (see Figure 3). While the beginning of the process remains the same, the experience gets different after the coffee and water preparation were done. Instead of a V60 dripper, a rok presso that concealed the ground coffee is utilised. Instead of directly witnessing the coffee's colour transformation, the barista would take us to the ice and the mixing department. We could see the barista reaching for the milk and ice from the container and pouring it into the shaker along with sugar or syrup. Even if we could not see the ice directly, the sound of the ice scoop spooning already gives us the chill. Afterwards, we could see and hear the shaking process, imagining the taste of the mixture even if the ingredients were hidden inside the shaker. In subsequent, we could see the mixture moving to our cup, generating an opaque white colour into it before the barista puts it into the bottom part of the rok presso. From there, the barista started to pour the boiling water over the ground coffee, producing the vapour and aroma just like the V60 story before. Then, he began to press the coffee with the rok presso, dripping an intense dark brown colour to the top of the mixed milk on our cup. The dark brown colour slowly turned lighter, slightly integrated with the opaque white colour, creating a visual layer of brown and white which indicated the balanced proportion between the ingredients, before we can finally taste the delicacy at the end of the process.



After the analysis was completed, creating a reading of the overall potential of materiality and immateriality of coffee-making, we shifted our mindset from researcher to designer perspective. We implemented the material and immaterial

Figure 3. Story of iced latte

reading within the design by programming and arranging the objects into three-dimensional space (see Figures 4 and 5). We tried to maintain the ergonomics factor to ensure the barista can work comfortably without reducing the customers' experience as the story's audience. By looking at how our senses perceive sight, smell, and sound, we generated a clear space between the barista and customers to ensure all the sensory transactions and any dialogue possible.

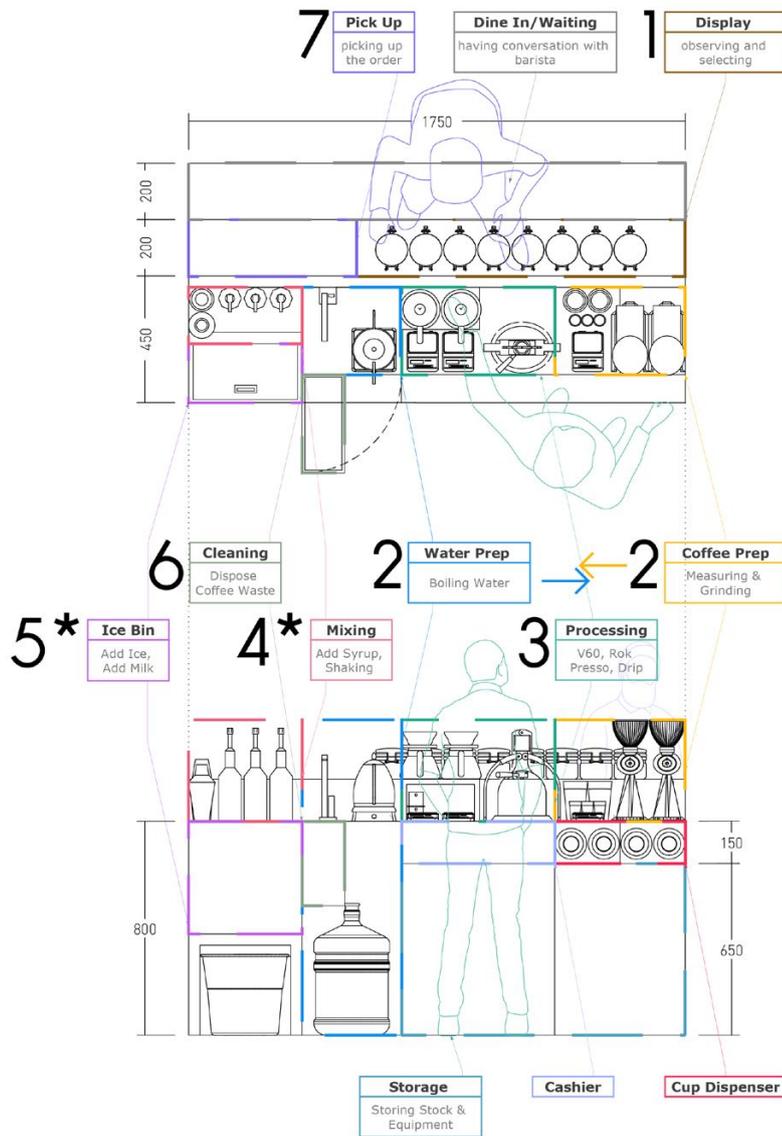


Figure 4. Three dimensional spatial arrangement visualisation

The design process started by organising the display group of objects, which consists of coffee beans inside the jars. Since it would be the first hook in the coffee-making story, we placed the relevant objects on this group at 200 mm in front of the customer sitting area, which is still within the barista's hand reachability on top of the prominent surface, occupying a 0.27 m<sup>2</sup> space. After identifying the bean variants from the label on top of the lids or side of the jars, this specific placement allows the customer to quickly grab the jars and smell the coffee aroma inside them that can be only scented by inhaling from a close

range to our nose. With jar's reachability and visual accessibility becoming crucial, we elevated the position of this group by 100 mm above the prominent surface to 900 mm height, ensuring the distance at a similar level with the sitting customer's eye level, giving better reaching access to the barista by a vertical separation from other groups.

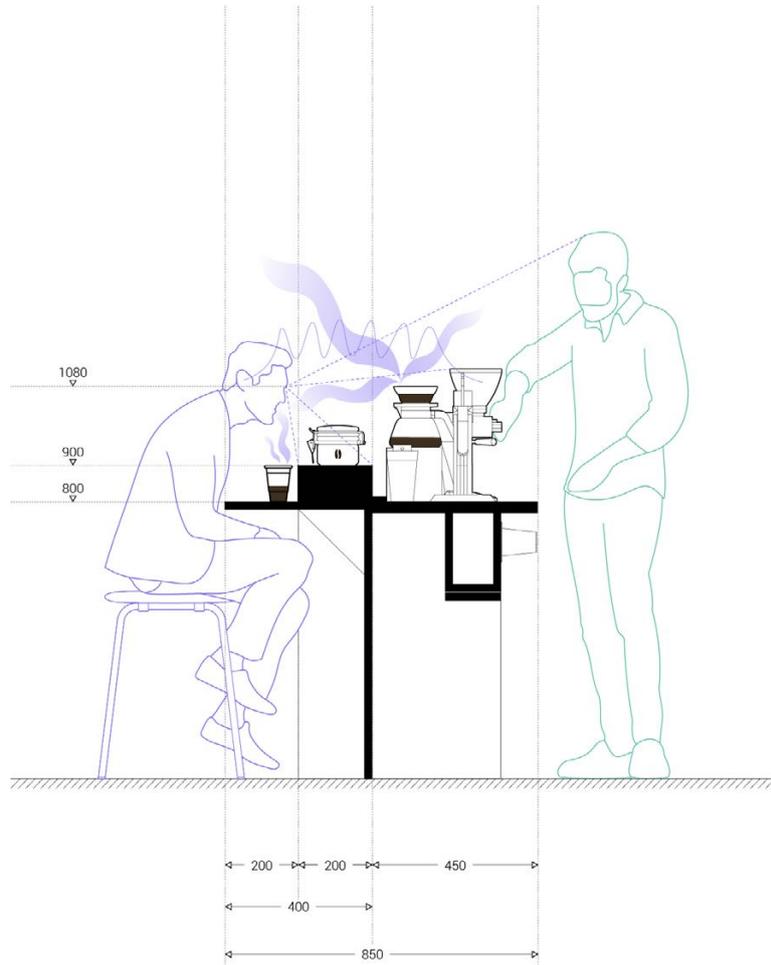


Figure 5. Sensorial transaction within the spatial arrangement visualisation

Secondly, we arranged the coffee and water preparation group as a direct sequel to the display that occupied 0.2 m<sup>2</sup> and 0.135 m<sup>2</sup> of the prominent surface. We arranged these groups right behind the previous group, closer to the barista's workspace, to reduce the movement needed for moving to the preparation phase. Three essential objects need to be recognised by the customer within these groups: The gooseneck kettle, coffee grinder, and induction stove. Hence, we placed the grinder in a pretty clear space to ensure good visibility and audibility to the customer since sound will travel better in unobstructed space. At the same time, the kettle and stove will be noticeable visually, audibly, or both when the barista uses them. Our next arrangement positioned the processing-related objects, by separating these groups as the kettle and the ground coffee in the intersecting measuring cup. We also ensured that every button from these objects is within the barista's finger reachability on both left and right sides.

Thirdly, we explored the main attraction group of objects, which is the objects for coffee-processing. This 0.23 m<sup>2</sup> area is where all of the manual brew tools are placed and utilised. As mentioned before, this processing group is positioned between the coffee and preparation area where the ground coffee and the boiling water will meet inside the manual brew equipment, generating a series of sensory stimulations. Even though these objects are front-facing towards the barista, with approximately 400 mm horizontal distance from the customers, they would still be visible as part of their experiences. Keeping the objects in this specific distance is vital because the produced aroma constantly moves and spreads in all directions ("Appliance of science," 2017), making it harder to be scented if the coffee maker is placed further since its flow cannot be predicted. The position of the manual brew tools is interchangeable depending on which method the barista is going to use, except for the rok presso equipment since it requires ample free space to operate them.

The fourth process consists of the organisation of the mixing and ice-related object groups, taking a 0.18 m<sup>2</sup> area within the prominent surface. These objects were arranged beside the water preparation area within a vertical connection with mixing on top of the ice group and were placed together as most of these objects are only used while making lattes purposes. Flavour syrups and the shaker were positioned within the prominent surface where the cups travel around inside the process. The ice bin was placed below it, giving easy accessibility to reach the milk and ice in the latte making process from the top of the main surface. At the same time, the ice bin position also ensures the handling of the melting ice by flowing the water directly to the water bucket beneath. In this station, customers can enjoy the story by seeing the barista interacting with the mixing equipment, their workflow, and the audio experience from the shaker and ice scoop.

The fifth stage corresponds with the hidden groups of objects, such as the cleaning equipment, storage, cashier, and cup dispenser. These objects were all positioned below the prominent surface to conceal their presence from the customer since they are not directly involved in sensory experience producing for them. Based on our observation of BEEU Coffee coffee-making workflow, the objects that are related to cleaning, cashier, and cup dispenser are only accessed at the end phase of the story. Since most of the story will end at the processing station, we directly arranged the cleaning, cashier, and cup dispenser. The cleaning area is placed on the left side so the barista can open the bin with their left hand while holding the coffee waste with their right hand. The cup dispenser is on the right side for the barista's right-hand easy access, and the cashier is on the middle since usually, it requires both hands in the transaction process. Below these three stations, a storage area is used to store every stock and equipment for daily operation.

Last but not least, after we were able to compress all the groups into a 1,750 x 650 mm area, we extended the prominent

surface by 200 mm towards the customer's space for dine-in purposes, connecting the sitting area to the coffee jars display. With 1,750 mm width, this area can accommodate up to 4 people at one time. To maintain the sensory transaction qualities, we believe it is vital to keep the distance and proportion. Hence it is not recommended to add more capacities to this single small coffee stall as it will slightly disrupt the balance we have tried to achieve.

### Conclusion

Exceptional architecture is the one that leaves a great impression through its atmosphere (Zumthor, 2006). To fully experience the atmosphere, we can not solely rely on our eyes. It takes more than our visuals to capture the essence of our surroundings. The qualities of the air that transmit scent and sound are vital to be caught to build up long-lasting memories as a part of experiencing the architecture. The sensorial perception of air is a dynamic physiological experience that calls for a human exploration with the body as a perceptual instrument at its centre (Wagenfeld, 2008). Hence, it is crucial to incorporate our other senses in our design practices, acknowledging the potential of immateriality to shape up the materiality itself.

As reviewed in the coffee stall project, the atmosphere-based design does not necessarily ignore the functional aspect of the spatial ideas. Instead, it allows us to rethink the meaning of the surrounding objects as a basis of programming in our design practices. We can see the objects transcend from their primary function, serving a dual purpose through its materiality and immateriality. The objects play an essential role in the spatial arrangement process to generate a functional system and tell a narrative and a series of sensory experiences for a more profound impression. In other words, the atmosphere gives us a window in exploring our practices further by breaking the boundaries of functionality or visually aesthetic.

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