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**The Limits of Tactil Space**

**ABSTRACT**

"Borders and Limits" Borders and Limits. Difficult is not to build a building, difficult is to build a meaning. Choosing a floor that you will live in, making a choice on which surface to do, and choose the details on a wall, is just part of a global process of setting boundaries and connecting materials. Peripheries that identify the marginal limits of surfaces are relevant to their interpretation, effectiveness and functioning. Just as a picture lacks a frame, or its absence tells us something about the choice made, also the surfaces in what is made need to mark their boundaries in a defined way or not, but always contributing to recognition of their character. Different or equal, contrast or camouflage. It is important to reflect and think on the cultural context, the meaning that supports the choice, and validate the options. The importance of detail to value the whole is not to be overlooked. Little things make a big difference. The scale of proximity to the human being, the contact of the foot and the hand as an interface between the human being and the built work, is a process of sensory apprehension of architecture, and possession of the built physical space, imply choices and options, bring different results in the experience and success of the concerned. Whether natural or artificial, the limit can be a confrontation, or can be softness, whether in nature or in a built environment. We have fluid transitions or we have aggressive transitions. And this process is repeated in the various scales of analysis, from the question of country borders to mere transitions between compartments or transitions of areas. The question of limits is often omitted to the detriment of the valorization of surfaces, an error that leads so many times to the bad resolution of the limits to compromise the final result of the whole, unbalanced by the absence of reflection around the solution of limits. To solve the details is to solve the amplitudes, to make the work more consistent, from a practical and functional point of view, and at the level of aesthetic and cultural coherence. To choose boundaries is to implement character and culture perception on a complete work, level away from only choosing surfaces.

Keywords: borders, limits, surfaces, context, experience.

## **Introduction**

This paper is about the importance of physical limits in the tactile pattern of architecture. Focusing in the role of limits for a better comprehension of space, its significance, and the way it relates to the human user.

The more you can learn from reality, more you are able to realize projects from virtual concepts to a reality of success.

However virtual the mental world we focus on, however much extensive use is made of computers, gadgets, and other computing devices, the illusion of the virtual is no more than a mere overlap in true and physical reality.

We live, whether we like it or not, in a three-dimensionality that imprisons us or empowers us with plenitudes. The world is 3D made, and it is in it that we live the reality of our being.<sup>1</sup>

We are always consumers of three-dimensionality, we use space, equipment, design and architecture, the most multiple ways, right and wrong ways, confrontation or adequacy.

We act on and in the space that surrounds us, interacting permanently through the 5 senses that bind us to the surrounding world, of which we are an integral part.

We feel comfort or discomfort insofar as we find suitable physical realities or not, in a permanent reflection on the three-dimensional space that surrounds us and with which we establish palpable metric relations.

We use three-dimensionality with the aim of pursuit for our comfort and intended uses, various functions for which they were designed. We invent ways of integrating spaces, places, stones, walls, objects, furniture, all the infinite three-dimensionality that surrounds us at our disposal in order to create our daily activities, experiences, tasks, and actions.

We live a life, whatever it is, inevitably attached to three-dimensionality, immersed in the physical reality that accompanies us, and we are, whether we like it or not, consumers of three-dimensionality.

## **Objectives/Purpose**

The aim is to focus in the value of tactile limits that contributes to the adequate understanding of the architectural spaces, their content and symbolism, understanding the needs and meaning of the user, in order to guarantee the production of spaces and built environments that meet the technical, formal and symbolic needs, resulting in efficiency, comfort to the user and is satisfaction.

In this sense we observe and analyze the existing constructed places to promote the understanding of the places yet to be. It aims at achieving skills that enable the professional, both in the area of design and architecture, to be able to formalize details that contribute positively to the achievement of a qualified built reality, ensuring a better overall quality of architectural and urban planning places.

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<sup>1</sup>July 2018 in: <https://www.quora.com/How-do-we-know-that-we-live-in-a-3D-world>.

## Context

We are merely players at this world (Shakespeare, 1603).

*“All the world’s a stage,  
And all the men and women merely players;  
They have their exits and their entrances,  
And one man in his time plays many parts”*<sup>2</sup>

And it all starts with an initial and ends with a period. All life exists between birth and death. All surfaces exist to their limits. Even if it is the infinite. All the journeys begin with a small step, all ending with a destination (to paraphrase Laozi, about 550).<sup>3</sup>

To solve the details is to solve the amplitudes, to make the work more consistent, from a practical and functional point of view, and at the level of aesthetic and cultural coherence.

To choose boundaries is to implement character and culture perception on a more complete work, interacting with the overall value of the constructed.

Thus, our whole life is also between the beginning and the end, and during the time that is granted to us, we exist in this world, a physical, concrete and three-dimensional world. It is a place where the built tactile is understood by the 3D modeling that supports your understanding.

Undoubtedly, to perceive space in a Euclidean matrix is, in a sense, reductive. But it is also useful, depending on the scientific context, and especially the scale of analysis.

For a common use of the anthropometric relation of people to things, the Euclidean structuring of three space directions fulfills the requirements of an understanding and facilitating matrix of spatial and comprehensive organization.<sup>4</sup>

In this way, this proposed methodology aims to illustrate how limits can interact with the user, and thus, why is important to know the implications of boundaries at any level of a projected environment.

### *The Three-dimensional Space*

However virtual the mental world we focus on, however much extensive use is made of computers, gadgets, and other computing devices, the illusion of the virtual is no more than a mere overlap in true and physical reality. We live, whether we like it or not, in three-dimensionality that imprisons us or empowers us with plenitudes.

The world is made of density, and it is in it that we live the reality of our being. We are always consumers of three-dimensionality, we use space, equipment, design and architecture, the most multiple ways, right and wrong ways, confrontation or adequacy.

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<sup>2</sup>As You Like It, Act II, Scene VII, Shakespeare (1603).

<sup>3</sup>July2018 in: <https://bit.ly/2iZl8D>.

<sup>4</sup>July2018 in: <https://www.quora.com/How-do-we-know-that-we-live-in-a-3D-world>.

We act on and in the space that surrounds us, interacting permanently through the 5 senses that bind us to the surrounding world, of which we are an integral part.

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We use three-dimensionality with the naturalness of the pursuit of our comfort and intended uses, various functions for which they were designed. We invent ways of integrating spaces, places, stones, walls, objects, furniture, all the infinite three-dimensionality that surrounds us at our disposal in order to create our daily activities, experiences, tasks, and actions.

We live a life, whatever it is, inevitably attached to three-dimensionality, immersed in the physical reality that accompanies us, and we are, whether we like it or not, consumers of three-dimensionality.

Three-dimensionality ... And what supports three-dimensionality, what is the foundation of your reality? If we speak of the environment, of what exists independently of the will of man, then it is governed by natural laws, by physics and by chemistry, by the rules of nature, in each factor independent of man, but combined among them, interdependent.

But in terms of constructed three-dimensionality, it is supported in the previous mental conception, in the underlying concept. It certainly has the maintenance of the part subject to the natural rules, but is fundamentally supported by the conception that gives it the intended form. The concept, the reason, the aesthetic, the cultural component of adding meanings, is what will motivate its manufacture. What is built exists previously in the minds of those who will build.

There is an inevitable argument: there is no human action without three-dimensionality, everything happens in a physical space, life support. Three-dimensionality defines spatiality, and this is the product and producer of culture.

Space influences man, and man influences space. It is an objectionable concept of subjective application. This relation is intrinsic and subjective in its detail, but general and common in its general contours.

The relation of man to three-dimensionality is permanent and not disposable, in conflict or harmony, in an original or altered physical reality, in a collective or individual relationship, and governed by multiple factors of variable weight, which depend on the degree of scale applied to the analysis.

The genius loci is an absolute truth of subjective reality, a mutable concept, which depends on the factors considered, on the place and scale involved, on the intervening actor who interprets, defines and recognizes it.

Discovering method and tools to provide interpretation of a place, of an operational methodology, can provide a basis of effectiveness so that the actors in the territory, in the architecture and in the day-to-day design are clearer and more specific in the objectives and results, thus doing an action positive on the life scenario, so as to find a dynamic balance of human life, its well-being and destiny.

The theory of architecture must thus reflect itself as a model with operational application in the real, in order to realize the purposes of efficacy, well-being, and

in a final sense, to promote the balance and well-being of man in his habitat (natural + built).

The static and the mobile. The mere play of words expresses the poetics that involve the analysis and synthesis of reality, suggesting more than expressing, highlighting situations and details that being part of a larger context, express, explain and reconfigure, because each synthesis is an alternative. No reality is absolute and stable for everyone, not even for the self that is autobiographically permanently redefined.

But is there an objective and non-subjective reality? Yes, the three-dimensional reality, matter (rich in values, mass, measure, texture, color, shape, etc.) is the palpable concrete that surrounds the individual, who confronts him with materiality in his trap and makes him a "victim" for interpretation. Man is the moving reality of the immobile surroundings.

Not everything is immobile, the subtle permanent movement of nature rules destinies and paths of each day making unique moments unrepeatable. Hence, the seduction of sunrise and sunset in the urban landscape, the appeal of the ever-changing sea, and the vast natural landscapes to the rhythm of the seasons.

Architecture is an art and technique that takes place at a certain static moment, but it has a relevant impact, because most of the information we receive is visual, and the architecture that is experienced and experienced like no other art, imposes itself in sight and enjoyment of all.

This would lead to a long reflection on the diachrony of the times in search of the invariants, and perception of how the variants evolve. More than the static it is necessary to know the mutable, and its non-normative processes, because they are alive and in permanent reconfiguration.

Nothing exists without physical context, without spiritual concretization on the space, operative action on the operative. Physical reality supports the immaterial, the thought, the invisibility about the places.

Active or reactive: active presupposes an initiative of its own, an action of internal motivation. Reactive is just the need, the imposition of a response to an external stimulus.

What is reality? What is the illusion? It would be the simple dysfunction of perception. Deception, error, omission, only reactions to different understandings of the constantly reconfigured multiplicity of our analysis to an ever-changing environment. Mutatis mutandis. The mutation that transmutes itself into an alchemy found.

The prison that frees us is three-dimensionality well resolved. Delete spaces that constrain us, add value. To create three-dimensional seduction is to act on the hidden but present plan of well-being, to solve lives by spatial resolution.

**Figure 1. Urban Design Strategy by Gehl Architects**



Life, space and buildings. Life is functions, and this human activity relies essentially on two variable moments, movement and permanence. These events take place in the occupation of the voids, of space, which in turn is contained, closed, or open, unlimited to the horizon. From the definition of the limits we find the definition of the emptiness possible to be occupied and used.

The reflection around the limits is affected by the scale of the analysis, so we can find the theme of recurrent limit in the various scales to which we propose to test, in the above case, urban spaces forming analysis units capable of constituting a whole, on a smaller scale, inside buildings, in the strictest sense of architecture. Let's try to see some essential factors to the understanding of limits in space.

### *The Limits*

*"In the Roman pantheon, Janus is the two-faced god of beginnings, limits, doors, gateways, and departure"<sup>5</sup>*

It is by the threshold, by the formalization of the border line that we mark this side and the other, the border of the parts, the creation of the pattern between this and that. It is through the human body and its 5 senses that tactile ability identifies us in 3D, the physical formulation of concepts. Without the physical, the mental does not subsist.

God Janus, the permanent company at all times, for we only inhabit the "now," lost is the "past" instant, and the "future" being always unreachable by definition. Being this truth in the temporal dimension, it is also in the apprehension of the physical space, because the space is not anamorphic, but consists of parcels separated by thresholds.<sup>6</sup>

*I can tell a little story that allows us to perceive the notion of threshold. Once upon a time there was a village where two old inhabitants lived. One day, one*

<sup>5</sup><https://en.wikipedia.org/wiki/Janus>.

<sup>6</sup><https://ferrebeekeeper.wordpress.com/2013/05/16/janus-god-of-the-threshold/>.

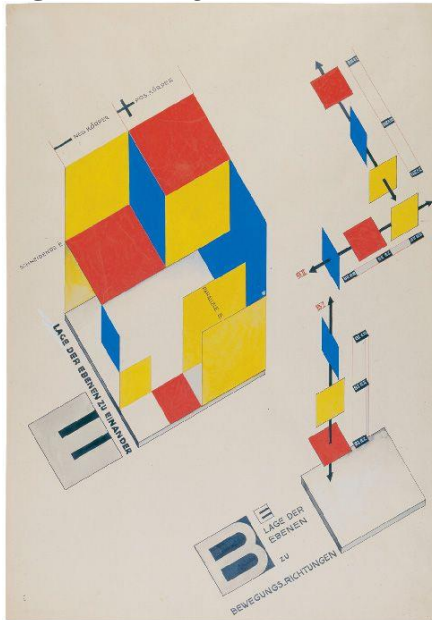
*of them went to a market and bought a new vase and took it home. The other, when he saw him arrive with the vase, asked what it was for. He replied that he was going to put soil in and grow a plant. The other one laughed, saying it was a worthless purchase. In fact, if he was going to use the empty space inside the container, then he would use the empty space, not the vessel itself. And the space inside the vase already existed before the purchase of the vase. So it was useless buying. They looked around and imagined how many vessels were invisible there. Then they realized that the vessel was not an object in itself, but a concept of boundary, just as the house in which they lived bounded the preexisting space and created the inside and the outside. We can only use the empty space, the rest are only constructed borders, the threshold between two places. (Ancient oriental legend)*

### *Architecture as a Space Container*

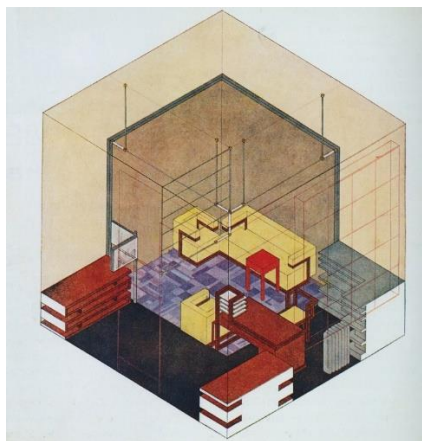
We always and only interact with our 5 senses (sight, hearing, touch, smell and taste) with the surrounding world. Confrontation body/architecture: The house as a space container.

*“In the composition of a visual construction, a plane serves to define the limits of boundaries of a volume. If architecture as a visual art deals specifically with the formation of three-dimensional volumes of mass and space, then the plane should be regarded as a key element in the vocabulary of architectural design.”<sup>7</sup>*

**Figure 2. Design Bauhaus Weimar**



**Figure 3. Design Bauhaus Weimar**



<sup>7</sup>CHING, Francis (1995) - Arquitetura: Forma, Espaço e Ordem. 10ª ed. Mexico: Gustavo Gilli, S.A-1986 9720.28 C539a).



The built plans generate closure. Depending on the relative position to the user, they get different names and uses: floor, ceiling, walls. And in addition to the surfaces, a limit in itself, also the ends touch or not, creating corners, or leaving the limit without formal ending.<sup>8</sup> 3 ways axis of thinking, with different colors for identification:

Red = roof, terrace, ceiling, floor.

Blue = inner wall, outer wall.

Yellow = other direction of blue.

The creation of an orthogonal and Euclidean space view of the world, is a process of tridimensional control.

#### *Fill Empty Space with Equipment*

But most of the time, you don't use the empty space in itself, but throw the use of equipment, furniture, the interface from human scale to the surrounding space of the room.

**Figure 4.** *The Working Place of Martin Heidegger*



With this furniture inside you can't see the limits of walls and floor, except in the ceiling.

This is a formulation of the house as a space container, for growing ideas. "Heidegger Arbeit Zimmer". The working room of a philosopher, taking more care about books and a simple place to write, everything at hands reach, disregarding aesthetics and detail of constructed simple walls.

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<sup>8</sup>KANDINSKY, Wassily (1996) - Curso de bauhaus. São Paulo: Martins Fontes (707 K16c).

The furniture it is not the only element for human use. In other examples of inhabited places we can see that the user of space takes part of the building, using a low wall as a table, chimney under big stone, or sitting near the balcon, or making the outside use of street sitting in a stone step. These are vernacular and popular uses, but even Frank Lloyd Wright put use of natural stone inside the "Fallingwater" Kaufmann House.

When we add the furniture, the cabinets, it is with the doors that we make the touch interface, that we act in function of the visibility, that we look for the utility of the storage. Thus, with this emphasis on equipment occupying the boundary of the enclosure, we have created focal points that will divert our attention from the actual limits of the built architectural space.

What we have here in this environment is to ignore the aesthetic and substantial value of the place to sublimate the pragmatism of spatial organization of objects and books necessary to provide for the good organization of the productive space. We can consider them to be "non-places" in the sense that they merely serve as physical support for a mental development of the user, which reaches the meanders of the spirit in the pragmatic simplicity of the physical space which it necessarily has to occupy.

They are a 3D space that supports the immaterial of cultural research, which cancels out in terms of architectural values. As such we find a very basic compartment, whose surface limits are hidden by the present equipment. We cannot see the boundaries of surfaces (skirting boards, corners and corners) except the wall boundary with the ceiling. In all these situations the tactile aspect here is fundamentally given by the manual reach of the arms from the sitting position. The positioning in relation to the source of natural light is careful, which is also related to the time to which it reports.

### *Denial of Boundaries*

The excess displayed put limits out of sight. Baroque architecture does the same. One of the most extreme cases of this internal occupancy of all architecture by a multitude of objects can be found in Sir John Soane's house museum<sup>9</sup> at Lincoln's Inn Field, London, a project of a life, permanently reinvented in greater complexity, to the point of shape of the compartments is not recognizable.

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<sup>9</sup><https://www.soane.org/>.

**Figure 5.** *Sir John Soane's Museum, Soane Square – London*



In Soane's Museum/House, London, the walls move to conceal more paintings, everything works as a "house machine", the user is part of the process of using the house, modified it according to the wishes and needs. It's a "no limit" wall, a wall-machine, opening or closing. As Le Corbusier said in "Vers une Architecture": *Une maison est une machine-à-habiter*.<sup>10</sup>

*The Trilogy of Distance*

**Figure 6.** *Carl Friedrich Atelier (1811)*



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<sup>10</sup>CORBUSIER (1986) - Towards a new architecture. New York, Dover Publications.

The minimalistic approach. Carl Friedrich in his atelier: the reduction of furniture focused on the subject of the painting in question. Well defined surface boundaries, enclosed space, only the window allows you to guess the exterior. There are three situations that we can relate to, of interaction with tridimensionality, proximity, threshold and distance:

Proximity = The artist and painting

Threshold = The walls, the room

Distance = The outside, blue sky and clouds

Different scales of approach, define different limits, but always with the same concept pattern.

### *Between Reality and Illusion*

The effect of mirror. From Velázquez's mirror in "Las Meninas", to the mirror of "Wonderland of Alice" by Lewis Carroll<sup>11</sup>, "Through the Looking Glass", and more, we see the extensive use of modern techniques to dilute the gap between reality and illusion, creating reflexions for the mind and to the eye. In the cutting edge of illusion.

### *Living inside the Edge*

Sometimes we can live on the edge, inhabit the gap between places. The scale matters. Between the land and the sea, the strip of the sand beach constitutes as a border territory. Between the public garden and the urban density constructed, the road is a living place on the edge.

In this sense, the need to refer all human activity to its own spatiality denies Marc Augé's "No place"...<sup>12</sup> This is an example (in Portugal) of living inside the edge, inhabit the wall.

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<sup>11</sup>CARROLL, Lewis (red. 2000) - Alice's Adventures in Wonderland. Peterborough, Ont.: Broadview Press.

<sup>12</sup>AUGÉ, M. (2008) - Non-places: introduction to an anthropology of supermodernity. London, Verso, 18<sup>th</sup> edition.

**Figure 7.** *Cloister of D. João III at the Convent of Christ in Tomar, Portugal, by Architect Diogo de Torralva*



The interpretation and inventiveness of the Serlian composition within the facade limits of the Cloister of D. João III at the Convent of Christ in Tomar, Portugal, is an example of the thickness given to the wall in order to make it habitable. In this example, the wall is a habitable, a truly permanence place.

#### *The “Sharp Edge” Architecture*

The cutting limit of the surfaces. Geometric defined forms, or sinuous forms. Geometric “sharp” forms leads many times for a cenografic appeal, but minimalistic actual interiors often lead to aggressive edges reacting to the touch of the hand and body, making a conceptual design, but a inospit one.

Minimalist architecture is not a poor art, it is the way to achieve the maximum emotions with the minimal resources, but can be aggressive to the user.

Human body and architecture: the quest for the limits between closure and the open wide space, the confrontation of the body with the limits, and the look to the outside. We reach for the limits to experience architecture. In the edge.

Proximity = you and the pool  
Threshold = line of “no place”  
Distance = the horizon line



**Figure 8.** *Marina-Bay-Sands-Singapore-Pool*



The “Infinity Pool” is a “magic” place where you are “always not there”, but in relation with the far views. It is not a place “to be”, but “to see” the horizon, a place where you always relate small to the landscape. It as a contemporary appeal, because actuality is most made of excess.

*The Boundaries Always Exist*

They can be undefined or defined, but somehow they always come to exist.

**Figure 9.** *Munichs English Garden*



**Figure 10.** *Versailles*

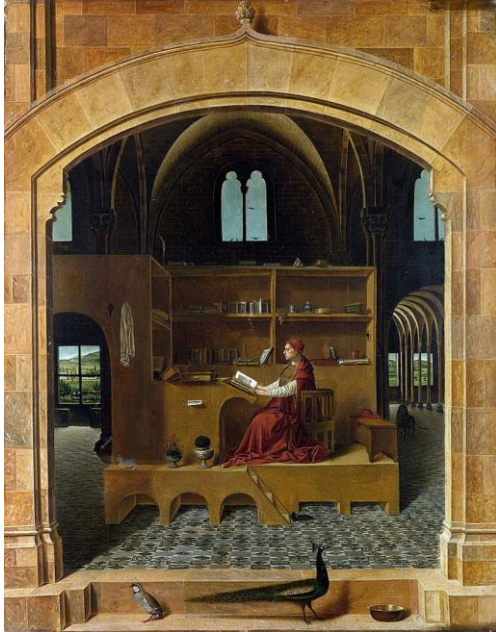


The “English garden”. With the sinuous limits of vegetation concealing the horizon. The “French garden”. With the geometric parterres and visual lines to the horizon.

*The Appropriation of Space*

These two images are the same pattern.

**Figure 11.** Antonello da Messina - *St Jerome in his Study* (1460)



**Figure 12.** Manutti Furniture Nederlands Factory



In a large undifferentiated space, the user creates a platform with defined limits of appropriation, where he concentrates his objects in reach, where he stands above the surrounding surface, and where all the elements interact in a coherent way, and from where he observes around him.

The hierarchical space: The elements in the landscape, natural or constructed, are a reference for human actions, namely for permanence, and unique elements in the landscape are strong references to create reasons for stay. People always mark their territory.<sup>13</sup>

### *Rules and Transgression*

**Figure 13.** <https://kirstiestott.wordpress.com/>



When limits are only guidance, the user can adapt to his own way. We can predict, project, we can create, but nothing guarantees success, or the intended previous goal. The user appropriates the space in its own way, because the constructed space is more of the one who uses it than of the one who imagined and constructed it. The result always has an unpredictable result, but always in accordance with the function intended by the user.

### **Conclusions**

Some things die. Some things grow. Life is a perpetual motion. And when, by internal motivation, by vocation or desire, we want to become designers or architects, it is in the perception of the way that material world interacts with the user, that the necessary change must happen, from consumer to producer.

This is a journey: a journey through space, time and art.  
Somethings taken from painting,  
somethings taken from architecture,

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<sup>13</sup>HALL, Edward Twitchell (1966) - Hidden Dimension. Garden City, N.Y., Doubleday, 1966 (OCoLC)556960173.



Some things in landscape, cityscape, and inside houses.  
All taken from what we can see around us.

The places that are our life scenery put in focus to find the reason, the purpose for understanding, the under flow of visual and substantial reason that can relate us to the tridimensional world where we live on. The limits are the tactile space that define all our experience in this tridimensional world.

To produce three-dimensionality, be it furniture, equipment or architecture, is to create spaces, metrics, forms, places, full and empty, with which the metrical nature of the human being as user will be faced.<sup>14</sup>

To make three-dimensionality is to bet, to predict ways of use that may result better or worse according to the adequacy and correctness achieved. Having the talent to predict how it will, or unexpectedly happen, use that will determine whether or not such a creation is successful.

Knowing how to produce three-dimensionality for an easy, effective and comfortable use will be the difference between success and failure. Being able to pass from consumer to producer is able to translate in spatial form the concepts, desires and uses that will be suitable for a complement of life of its users.

To know the people, to know the experiences, the declared and intuited desires, will be to know the ingredients that must be translated in a physical and real way for a successful accomplishment.<sup>15</sup> Because we will always be consumers of three-dimensionality, but only a few will be able to solve it and create it properly.

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