

ANGELICA HERNANDEZ

Polimi TIS

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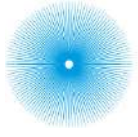
THESIS INCUBATOR STUDIO

LIGHTING AS A SPACE



**POLITECNICO**  
MILANO 1863

SCUOLA DEL DESIGN



**POLI.DESIGN**  
FOUNDED BY POLITECNICO DI MILANO

zafferano

Project developed within the Thesis Incubator Studio - Politecnico di Milano  
in partnership with Zafferano

CORSO DI LAUREA MAGISTRALE IN INTERIOR AND SPATIAL DESIGN  
THESIS INCUBATOR STUDIO | A.Y. 2019-20

#TIS\_polimi TEAM

Giovanna Piccinno, coordinator and professor

Anna Barbara, professor

Cristina Morbi, professor

Giulia Pellegrino, professor

Daniele Mazzinghi, assistant

Alice Zingales, assistant

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Autodromo Nazionale Monza

Cleaf

McArthurGlen Group

Zafferano Ai|Lati

ANGELICA HERNANDEZ

Polimi TIS

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THESIS INCUBATOR STUDIO

LIGHTING AS A SPACE


Thesis Incubator Studio



# HOW WILL NEW LIGHTING IMPACT THE SHAPE OF SPACES ?

Politecnico di Milano School of Design  
Laurea Magistrale in Interior and Spatial Design  
Thesis Incubator Studio 2019 - 2020

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# ABSTRACT

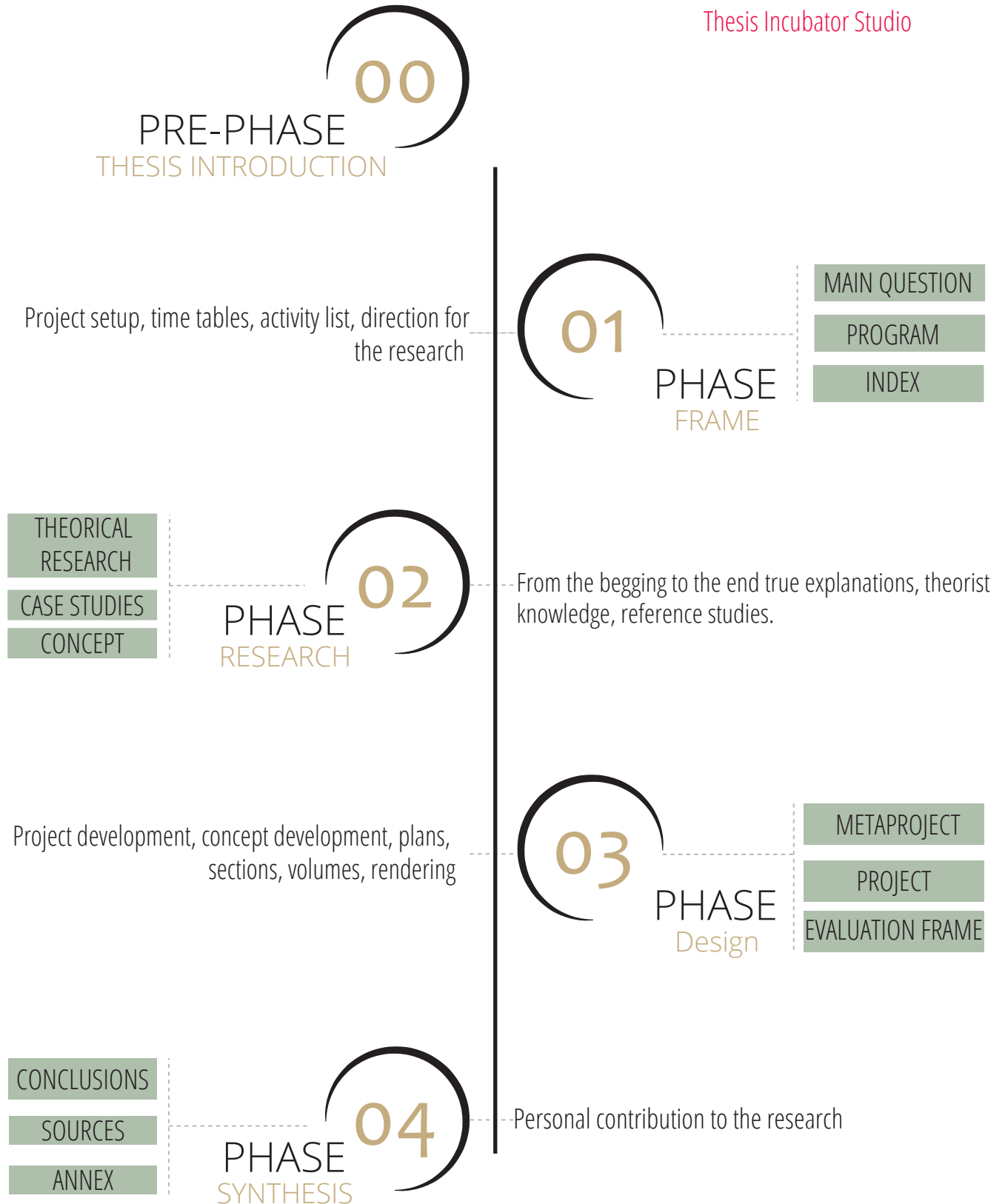
Which will be the future of lighting? Which role will the future of lighting play in space design? Lighting is a fundamental element for our world understanding, therefore for our space understanding. Light whether is natural or artificial has the ability to allow us to see, but moreover it is able to transform our space perception, it creates stimulus, it inform us and even is able to excite us. This intrinsec relationship allow us to understand how the lighting technologies development have impact in a significant way spatial developments for example, and is presicely due to this last aspect that this research has the aim to understand what features of lighting could radically transform the interior design field.

**"Ligth is not perceptible without from(...) Conversely, form is not perceptible without light to reveal it"**

(Millet, 1996, p.47)

# 01

**PROJECT  
PHASES**

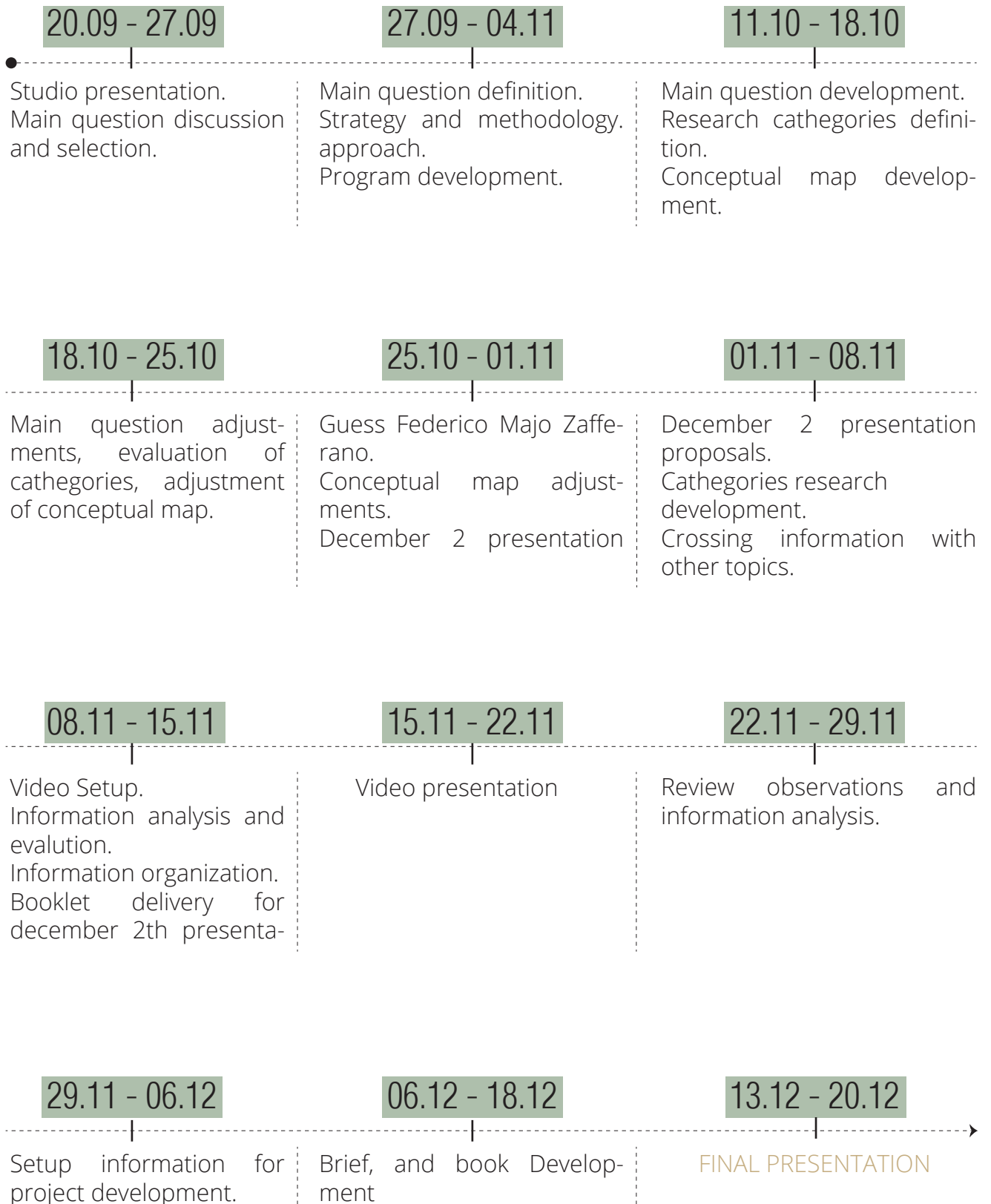


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# 02

**PROJECT  
PROGRAM**

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# 03

## ZAFFERANO

# COMPANY

Zafferano is an Italian brand founded and directed by Federico de Majo since 2001. Zafferano is a company where creativity and design join in a successful way., thanks to this, their products are characterized by the uniqueness, functionality, design and capability to bring emotions into their buyers.

Federico as head of the company has worked in the field of glass carrying on his Murano ´s family tradition of glassworks, from here he has created exclusive pieces made mainly of glass that at the same time bring out the talent of this industry from which Italy and Venezia are famous around the world. This experience of glass making has been merged into the field of illumination, in which his director, Federico is once again an expert. Thanks to this Zafferano nowadays combines the glass working with the illumination field.

The company has gained an important growth that today is represented in the constitution of different fields of design within the same company; Zafferano tableware, Zafferano AiLati and Zafferano Bespoke glass. Each of them creates an specialize field for innovative design. Zafferano Tableware on one hand focuses in the production of glass made objects such as bottles, glasses and porcelains. Besides their lightness and transparency each product of the company has the quality of expressing a story, a meaning that ultimately contain the soul of every product.

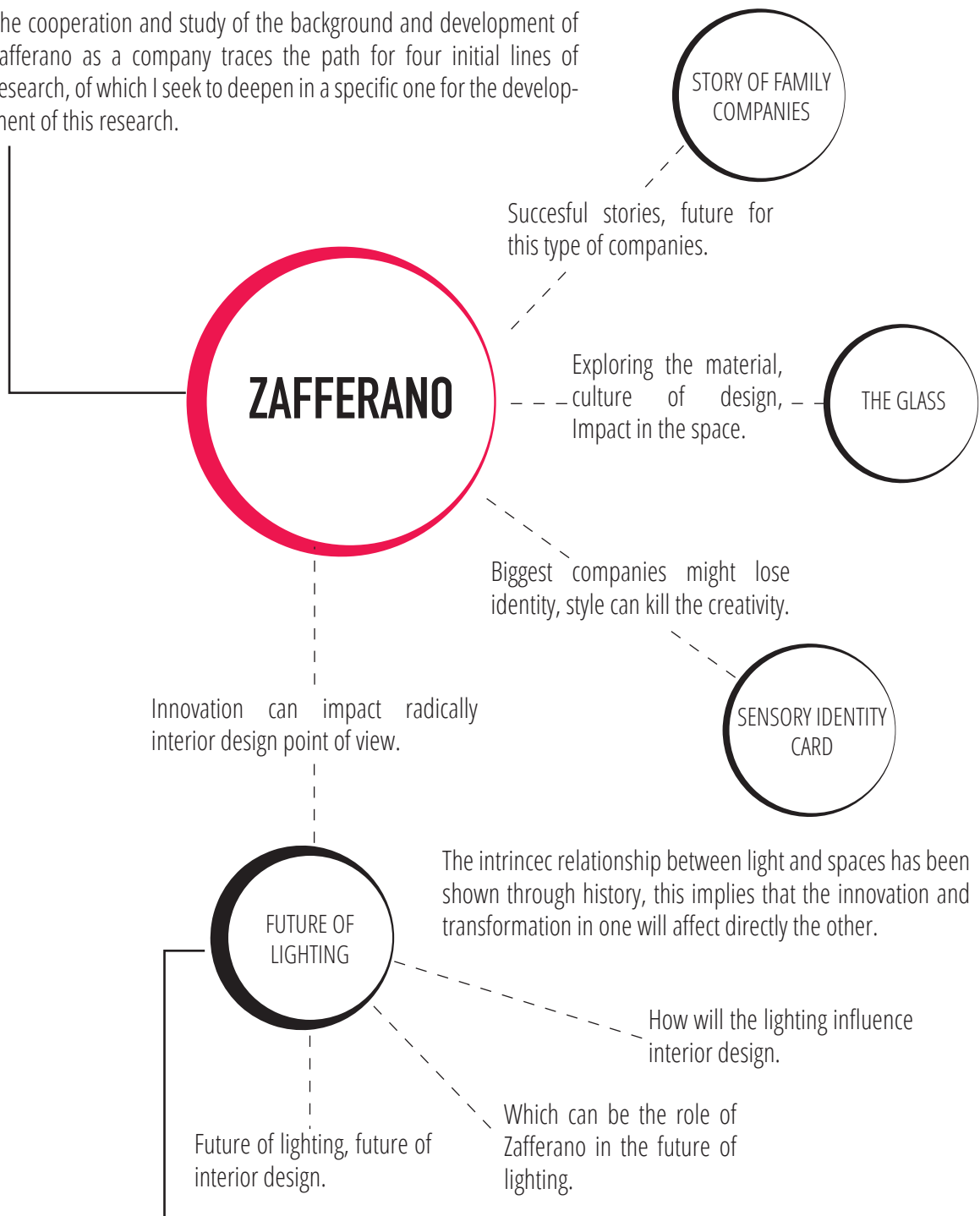


On the other hand, Zafferano AiLati and Bespoke focuses in the illumination field, where AiLati presents more technical and systematic products (although important design alternatives of lighting), it provides lamps for all types of environments. Even though Bespoke shares the development of lighting aspects, this part of the company merges the glass techniques of Murano with the illumination field.

In every aspect Zafferano searches for innovation, their products are able to tell stories without losing their functionality, elegance and sometimes even timeless design. They are a company in constant search for new shapes, new ways, new materials. Thanks to this Zafferano and Politecnico di Milano join forces through five experimental and reserved projects that aim to bring together interior design, the brand field and theoretical research in order to give different perspectives, to promote creative inspiration and innovation, to achieve new sensibilities.



The cooperation and study of the background and development of Zafferano as a company traces the path for four initial lines of research, of which I seek to deepen in a specific one for the development of this research.



HOW WILL THE FUTURE OF LIGHTING  
IMPACT THE SHAPE OF SPACES?

04

**HOW WILL NEW LIGHTING  
IMPACT THE SHAPE OF  
SPACES ?**

The establishment of this question as the main guide for the execution of this research, is mainly due to two important aspects; First, it is the undeniable relationship between light and space, and secondly, how this relationship has led to a mutual transformation in both light and space.

Light (natural and artificial) has created a complete evolution in the way we understand and live our world, as mentioned throughout this document; Light is the key that allows us to understand our surroundings, and like everything we know, light has had an evolution that completely affected the way we relate to space. If we take a look at history in relation to this matter, we can immediately understand how space has always been affected by light developments. Before, when candles or torches were the source of light, a darker and even more intimate atmospheres in spaces could be seen, as well as in the use or the activities carried out in them, which were limited because those sources of light characteristics. Until today, when the development of lamps allow our spaces to change permanently, where we are able to recreate open, light spaces through the help of artificial light, where our indoor activities (which is the main focus of space issues for this document) have been transform thanks to the possibility of having light in

a much longer period of time.

Lighting certainly gives us the rhythm for our daily activities and for the spaces in which we develop them.

When understanding lighting and its progress through time, we are able to see the parallel transformation in both, and as these transformations continue in an impressive speed thanks to the innovative capacity of the lighting industry, it becomes necessity to ask ourselves, which direction will be lighting and space take thanks to these developments? But furthermore, how we, as designers will respond to this transformation, which are the tools that we will be able to take to improve our interior design projects taking a close consideration to light matters? Will be possible at some point to consider lighting as a starting point for space design? For materials definition? For space building?

The main question set in this research as a starting point seeks to dig more into all of lighting and space matters, and hopes to take a direction to propose the use of lighting in interior spaces in an groundbreaking way, creating a link that can allow companies as Zafferano to take full advantage of this discoveries in order to innovate in their brands and their selling spaces.

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# 05

## STRATEGY

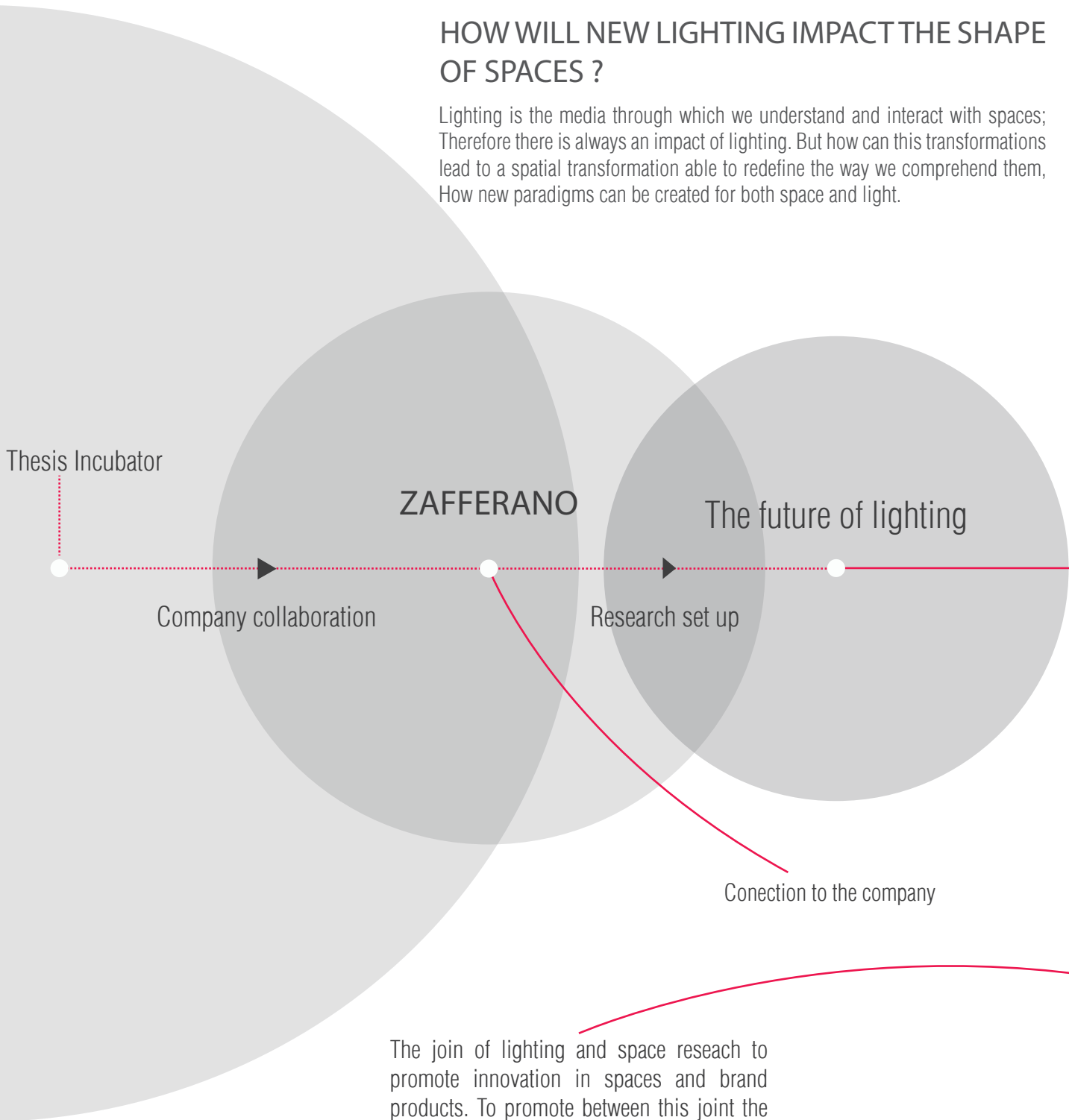
1  
TEAM-COMPANY  
RESEARCH

2  
PERSONAL  
RESEARCH

EXPLORATION

## HOW WILL NEW LIGHTING IMPACT THE SHAPE OF SPACES ?

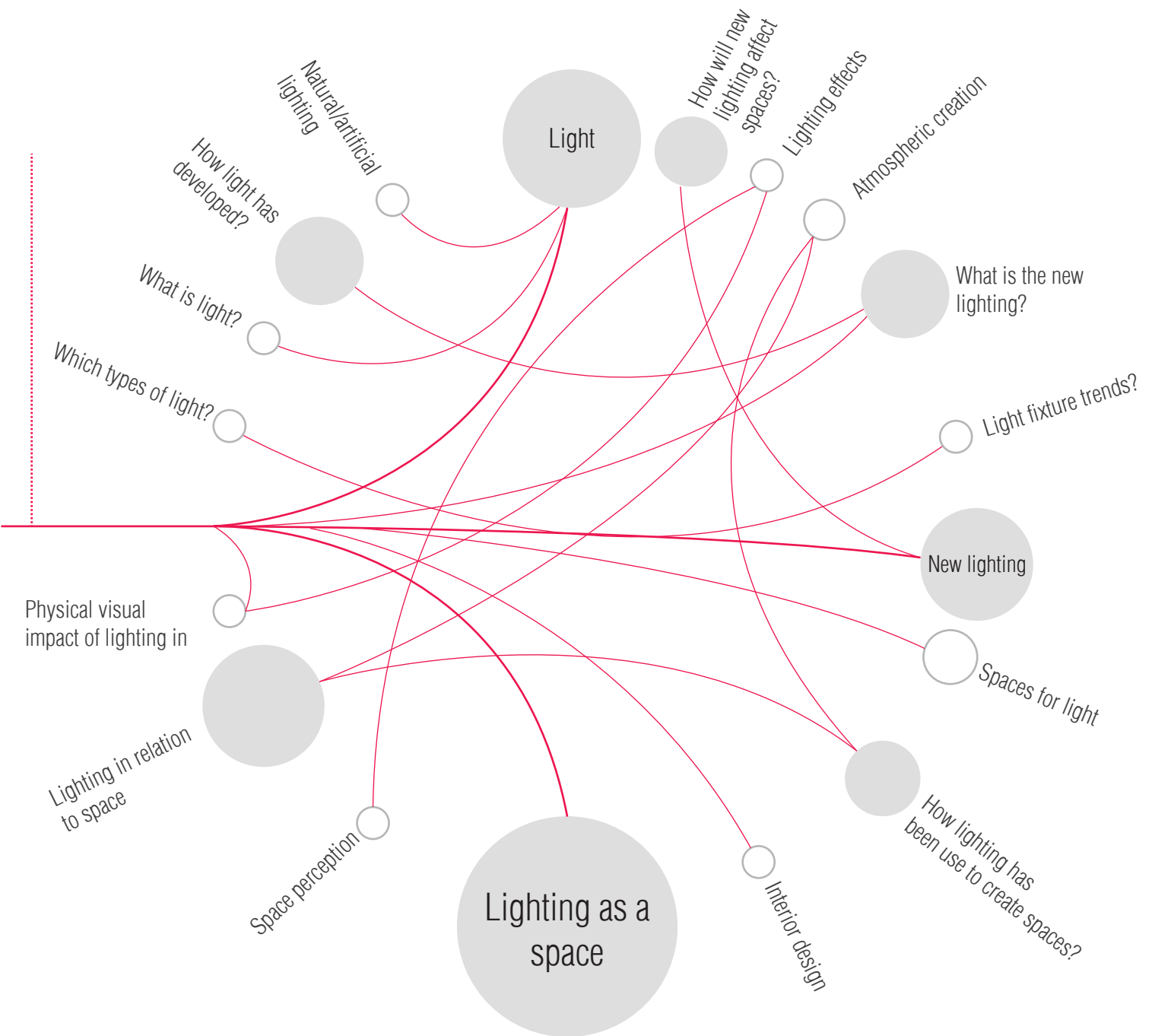
Lighting is the media through which we understand and interact with spaces; Therefore there is always an impact of lighting. But how can this transformations lead to a spatial transformation able to redefine the way we comprehend them, How new paradigms can be created for both space and light.



The join of lighting and space research to promote innovation in spaces and brand products. To promote between this joint the creation of new space-lighth experiences.

# 3 CREATION

# 4 REFLECTION BRIEF / CONCEPT



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# 06 CREATION

# LIGHT-ING

This document research is based in the relationship between light and space, for this reason it only makes sense to start by defining the concepts that can give the basic understanding of this matter for further comprehension of relationships and links between the information found.

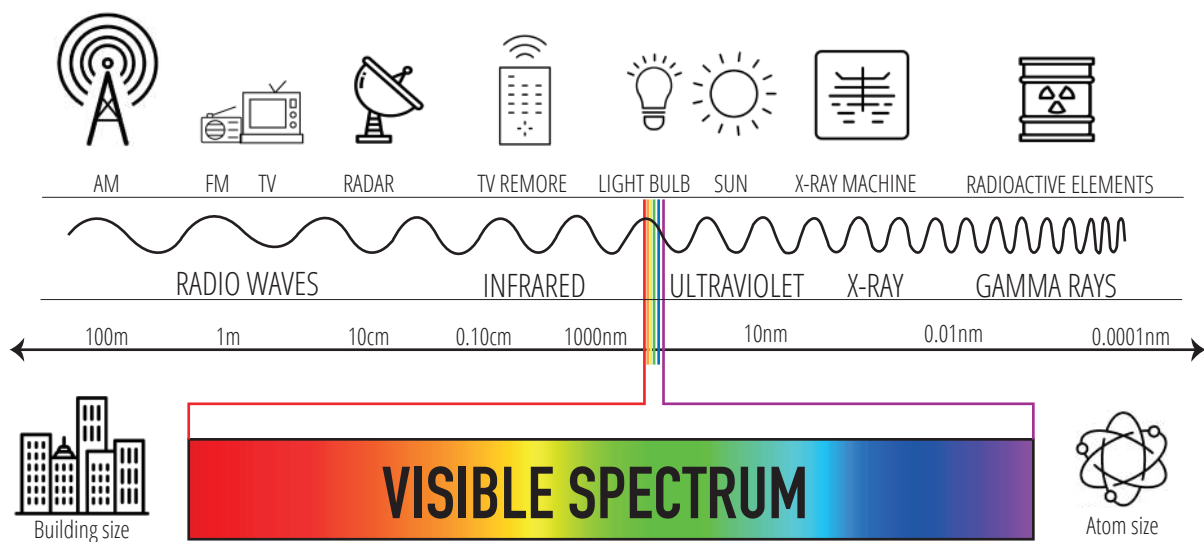
Therefore, as a starting point it will be introduce the question of What is light? How can we define it, the history of lighting and which is the importance of lighting for our daily life.

Light as definition is understood as “the electromagnetic radiation with wavelengths between 380 and 750 nm which is visible to the human eye.” Light is just one portion of the various electromagnetic waves flying through space. The electromagnetic spectrum covers an extremely broad range, from radio waves with wavelengths of a meter or more, down to x-rays with wavelengths of less than a billionth of a meter. Optical radiation lies between radio waves and x-rays on the spectrum, exhibiting a unique mix of ray, wave, and quantum properties.<sup>1</sup>

1.<http://citeseerx.ist.psu.edu/viewdoc/download;jsessionid=D1A53433BF31FE0655EB49CE41476922?doi=10.1.1.24.2078&rep=rep1&type=pdf>

2.<https://andor.oxinst.com/learning/view/article/what-is-light>

# ELECTROMAGNETIC SPECTRUM



“It is no accident that humans can ‘see’ light. The detection of light is a very powerful tool for probing the universe around us. As light interacts with matter it can be become altered and by studying light that has originated or interacted with matter, many of the properties of that matter can be determined. It is through the study of light that for example we can understand the composition of the stars light years away or watch the processes that occur in the living cell as they happen.”<sup>2</sup>

“Light is indispensable to life on the planet and consequently affects humans and other creatures alike. Notably there are important physical effects through the interaction of light with our skin and our eyes leading to the ‘warm’ (red light) and ‘cold’ (blue light) sensation as well as the side effects through our accommodation to the periodic changes each day and with the season which contribute to the regulation of activity/rest cycles.”<sup>3</sup>

1. <http://citeseerx.ist.psu.edu/viewdoc/download;jsessionid=D1A53433BF31FE0655EB49CE41476922?doi=10.1.1.24.2078&rep=rep1&type=pdf>  
 2. <https://andor.oxinst.com/learning/view/article/what-is-light>  
 3. [https://ec.europa.eu/health/scientific\\_committees/opinions\\_layman/en/energy-saving-lamps/l-3/1-light-electromagnetic-spectrum.htm](https://ec.europa.eu/health/scientific_committees/opinions_layman/en/energy-saving-lamps/l-3/1-light-electromagnetic-spectrum.htm)

As part of the understanding of the main concepts needed for the development of this research it is important to highline the difference between light and lighting and specially how this two types of light have influenced spaces. Despite the fact that both terms are equally important and significant for our daily activities and that both represent a vital role in terms of architecture and interior design (that is overall the central focus of this document), this research focuses in the understanding of the impact and part that takes artificial light in spaces, and in the conception of them.

#### NATURAL LIGHT

It seems obvious the definition of what natural light is. It is clear for all of us that the main source of natural light comes from the sun. However, there is much more to say and to understand about this matter. Natural light is our main source of illumination, as well as our way to understand the world that is around us. Light is so powerful and indispensable, as it was said before, that it

marks the rhythm of our life cycle and even our behaviors. As Cesar Portela defines in *Light in Architecture*: " There is no need to define what natural light is, but we do need to remember that this light allows us to define what is around us, by day and night: the changing perception of the things or the bodies on which it impacts, and the space that contains them. Light, or absence of light, can also transform this space in each season, each day of the year, each hour of the day, each moment."

Natural light, occurs inevitable, specially in terms of architecture, it can occur in a conscious or in an unconscious way, never minding which type of spaces we are talking about. Either way, "depending on how it is used, it can transform the spatial context, creating agreeable or disagreeable, sublime or mysterious sensations, the sensations of enlarging a space or making it smaller, or simply highlighting aspects of the space that interest us. And above all, it makes the space more agreeable, more comfortable, more habitable, more visible."<sup>4</sup>

4. Cesar Portela. *Light in Architecture*.

## ARTIFICIAL LIGHT

Artificial light or lighting, is quite different from the natural one. However, despite the obvious difference, it is important to make clear where one distances from the other, especially when we speak about the impact on spaces. Artificial light can be described as an “invented light that comes from a fixed and constant source of emission and, therefore its effect does not vary and it obviously implies consuming energy and, far too often, it also involves visual “noise”.<sup>5</sup>

As artificial light is conceived through fixtures that along its development have given to us the possibility to manipulated light in a more direct and significant way, if we compared it with the natural one of course. Thanks to this invention, we have had the capability to shape volumes in many ways, distort perception of spaces and even dramatizing the shapes and textures of the materials, enhancing their aesthetic features dramatically, all of them subject to the invention or creation of the architects and designers.

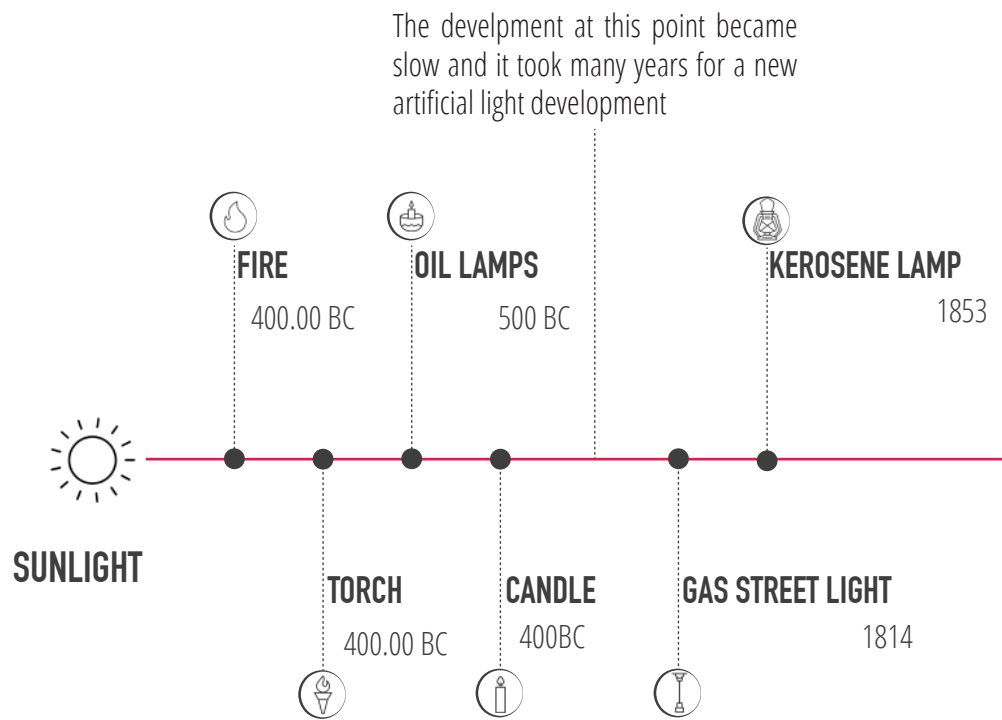
The transformation and in general the impact of lighting goes way beyond the possibilities of perception. Artificial light has changed deeply our way to live, “It changed human existence by illuminating the night and making it hospitable to a wide range of human activities. It was the infrastructure that was built to provide electricity to every home and business that changed the world. Today, our world is filled with powered devices than we can plug in pretty much anywhere.

Besides this, lighting has allowed us to work at night, to increase quality and productivity, it has transformed the outside and inside of our spaces. Thanks to artificial light cities are able to function during the night, it made cities more secure during those periods of time, and if we speak about the inside, that again is the main focus of this document, lighting has given us the opportunity to permanently manipulate the atmospheres and characters of interior spaces, nowadays we are able to change completely a space only through the help of lighting. Artificial light without question “has ceased to be a simple method of basic lighting and has become one of the fundamental pillars of interior and exterior design.”<sup>6</sup>

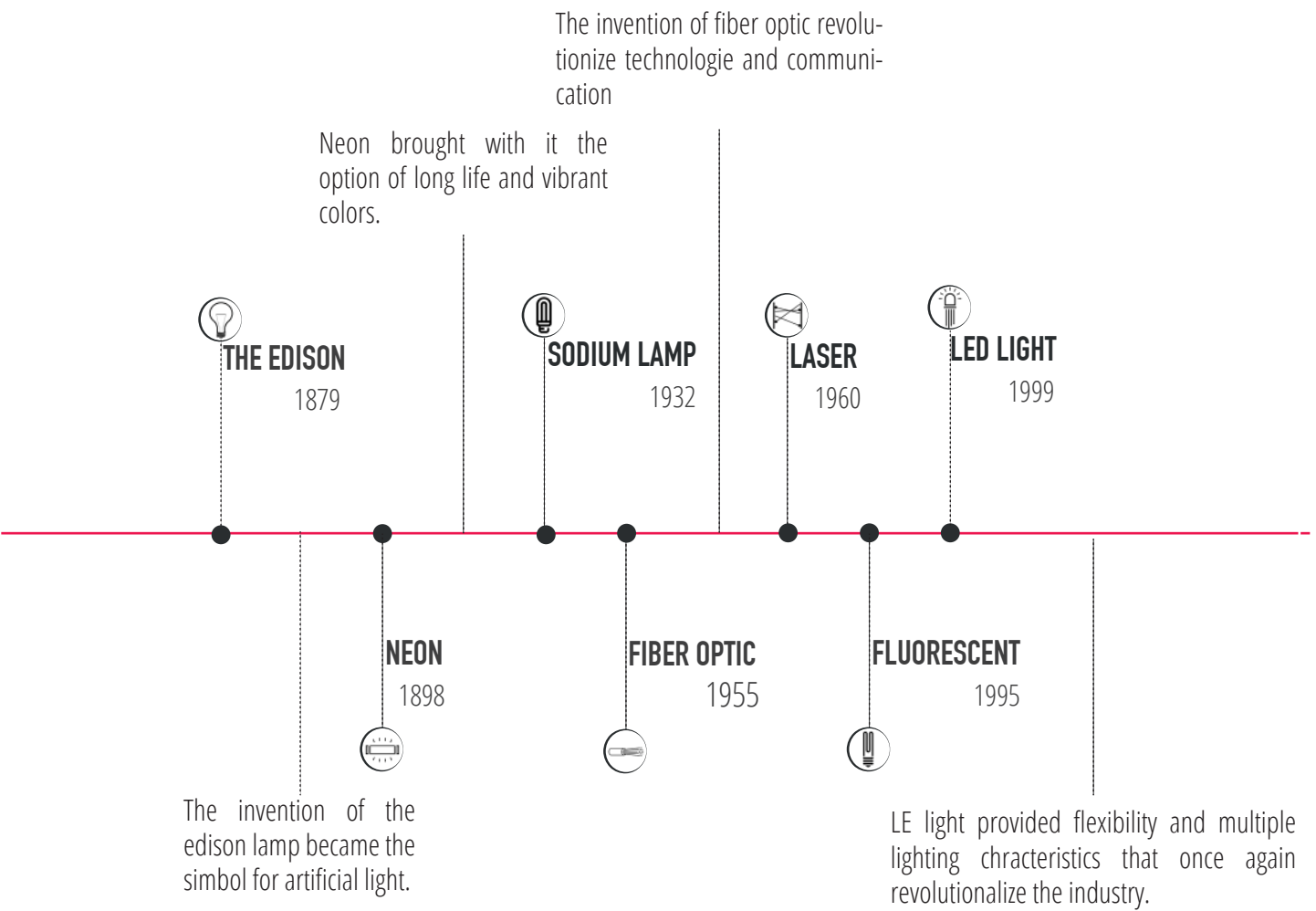
5. Cesar Portela. Light in Architecture.

6. <http://www.thedecorativesurfaces.com/en/artificial-lighting/>

# LIGHT-ING



To understand the future of lighting is important to analyze the evolution and significant aspects that have change the lighting along the history.



The evolution of lighting has come by hand with our evolution as humans and the necessities that we have acquired along our growth and change. The previous graphic presents in a conceptual and brief way the evolution that light has had. Part of this history is well known for us; but as it is indispensable for the purpose of this research to understand the impact of light, it is important to review every step.

The sun constitutes our main source of light, and is of course the starting point that led to what we understand today as lighting. We have established until this point that the sun has marked our rhythm of life in every way. It is possible to take as an example of how lighting connects with much deeper necessities than just the one of illuminating, the fire for instance, was precisely discovered thanks to the need to warm spaces, to warm food, to illuminate spaces. This eventually transcended to torches and then it was followed by candles. It has been estimated that the urgent for prolonging "daylight" helped the attempts of lighting to occur 70,000 years ago, a quest that even today we carry on.

Many attempts followed until the conception of the first lamp, one made of shells and flammable objects, which included even animal fat. The Gas lamps developed in the late 18th century where the next step, this allowed lighting to go in a bigger scale. Light was brought to the streets, and changed completely the dynamics of life in cities and of course in the interior spaces. But the true revolutionized object would arrive only one century after when the Edison lamp was invented, the possibility of electric lamps would be the step of a highly innovative element that became an indispensable one even today. Improvements and faster discoveries have been done in the last century, that have opened the door for ever more possibilities, the Neon light and its quality to incorporate the first try of colors in lighting, the efficiency of fluorescent lighting, or the remarkable fiber optic that became the key to new technological and communicative advances, as many other examples represented in the timeline graphic. Light in its conception is understood in the same way by all of us, but the amount of possibilities that lighting has created for us, goes beyond our full understanding.

<https://medium.com/zodhyatech/how-lighting-evolved-over-the-years-485bced8d6f8>  
<http://herzukka.blogspot.com/2016/06/how-light-bulb-changed-our-lives.html>



**“LIGHT IS AN ARCHITECTURAL  
FORM.”**

Bruno Zevi.

Thesis Incubator Studio

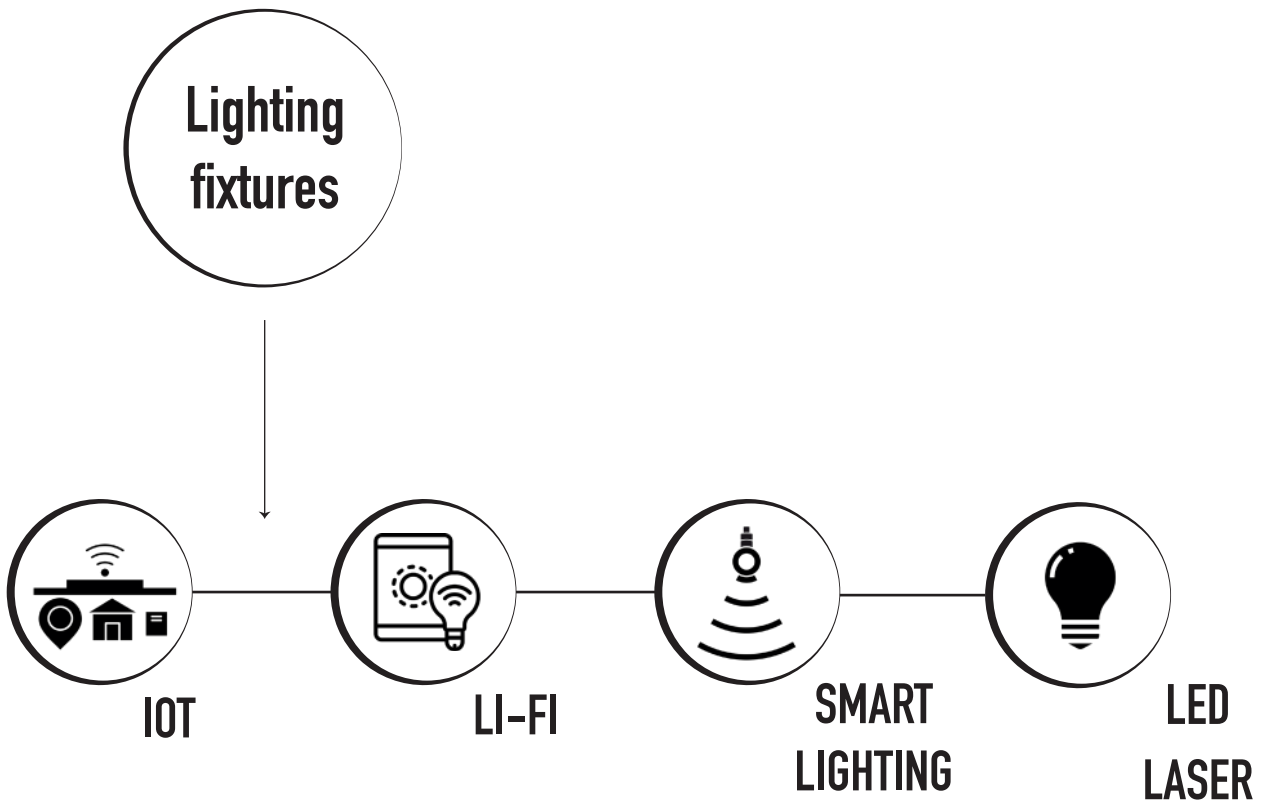
# 07

**CREATION**  
New lighting

# NEW LIGHTING

Since is the main purpose of this research to approach new ways to apply lighting, this chapters aims to approach the question of New Lighting, what is the new lighting about? And what features make up the future lighting.

So far it is evident that the 20th century has been altered by new lighting technologies that are changing in an amazing speed, within these technologies we find the LED light as the most mentioned one, it represents a clear path to the future, despite the fact that even they might be replaced by new lighting options; they represent the efficiency, the cost, reliability that not only lighting, but society is looking for the future. However, it is unfair to limit the present and future technologies just by talking about LED´s. The New lighting as it is explained here, opens two paths of analysis that will be shown in the following pages; The first one is related to the fixtures itself, the elements that make lighting possible and that are the channel for the second aspect of analysis, the lighting effects. Lighting as we know so far, has increased its possibilities in many ways and has found the way to merge in many other aspects of our lives, for which is important to highline the perceptions related to this matter.



This part of the research focuses on lighting fixtures as they are the main channel for lighting manipulation, the tool that allow us to shape lighting perceptions. For a better understanding of them, it can be defined as electrical devices used to create artificial light; these are devices made up by a fixture body and a light socket to hold the lamp and allow for its replacement. Fixtures may also have a switch to control the light, that as well requires an electrical connection to a power source; permanent lighting may be directly wired, and moveable lamps have a plug.

As part of the previous definition, it is key to speak about the lamps, as they are the light source, what is typically called the light bulb, which for obvious reasons take a fundamental part of the lighting understanding.

After this short introduction, this research aims to go deeper into some lighting fixtures that represent the new lighting that this paper is trying to explore, and that have a particular connection to spatial aspects. It is a first step to the future connection that it is trying to be established in here.



## WHAT

## HOW

### IOT (Internet of Things)

“ The Internet of Things is an emerging technology across the world, which helps to connect sensors, vehicles, hospitals, industries and consumers through internet connectivity. ” as the name suggests, is the connectivity of everyday devices with each other. the Internet of Things enables devices (things) to interact and co-ordinate with each other thereby reducing human intervention in basic everyday tasks.

The IOT has a complex and large way to function due to the number of devices that it needs to operate; Architecture has become an important tool to understand better the Internet of Things since the evolution of smart homes. An example of the process of smart homes and IOT is when the alarm rings and it sends a signal to the coffee maker and the toaster, which automatically start doing their jobs without any human intervention. Thus, saving time and making our everyday tasks easy, this type of device communication is precisely the Internet of Things.”



## WHY

### IOT (Internet of Things)

The reason why the internet of things is considered as part of this research is because of its co-relation with the two matters that direct this entire document. As it was briefly mentioned, architecture or spaces are part of an already existing term: IOT architecture. Architecture has made possible a context through which the internet of things finds its “space” of development. It has been defined as a “structure for the specification of a network's physical components and their functional organization and configuration, its operational principles and procedure”. We can understand from this that architecture becomes one of the requirements for this technology to develop. In here is important to highline the role of the interior and the exterior and how there has been a parallel development of IOT in both of them.

Is possible that thanks to the information that we have so far about this technology, we make an easier relationship between the interior and the IOT; we have seen cases like the one mentioned in the introduction of this chapter, where every aspect of our life inside can be easily manipulated, alarms settings, lighting and color intensities that are transformed by the choice of the user and because of the use of this alternatives.

Internet of things (IOT): A vision, architectural elements, and security issues. Conference paper. 2017

All of these transformations have even brought well-known concepts like smart houses. However, the impact of IOTs go beyond interiors and involve the exteriors too; making them relevant. As the concept of Smart houses has gain strength, so has the term of Smart cities, this term implies the possibility of connecting information, transform and adapt the urban environments, manage resources, etc. The internet of things in terms of space in general has provided new possibilities in the dynamics and interaction with them, which is letting design to transcend much more.

Lighting cannot be excluded from the relation of IOT. If we understand architecture as the environment or the context, lighting can be considered as one of the medias through which the internet of Things develops. The illumination industry has improved so much that it is coming a source of information, and is becoming part of a bigger system that helps us to shape environments, colors, perceptions, etc. All the possibilities or at least big part of them are being possible thanks to technologies such as the one in discussion.

The IOT is a fundamental part of the new lighting, the path towards a smart world is undeniable, therefore the appliance of this new technologies will become frequently and the relationship between lighting and space will gain strength as well. Lighting will become smart and will be tool to carry the Internet of things.



## WHAT

## HOW

### Smart Lighting

With the birth of The Internet of things, there has been a growing necessity to interconnect everyday objects. Lighting is no exception, on the contrary it is “a growing demand to bridge the gap between lighting and smart grid systems through Smart Lighting. “Smart lighting systems, which have been hailed as the next step in the evolution of lighting technology, innovates traditional lighting control by utilizing feed-back from user inputs and integrated sensors to manipulate the produced light output.”

Smart lighting offers more benefits besides the interconnection of objects, it increases energy savings, it can increase the light quality, regulate circadian rhythm, increase productivity, accelerate plant growth and implement human-centric lighting, among other benefits. “Smart lighting systems will have a positive impact on industrial applications and research on horticulture, architecture, building manage-

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Smart lighting : the way forward ? Reviewing the past to shape the future. Ivan Chew

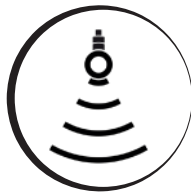




## WHY

### Smart Lighting

It has been established during this chapter the connection between IOT and smart lighting, and how one could almost be considered as the result of the other. Part of this relationship and the focus of on these matters, is based on the impact that both are able to create in the interaction of lighting and space. Despite the fact that smart lighting will contribute to the illumination field and without a though will provide spaces with better lighting conditions, Smart lighting and IOT will become important tools for dynamics transformation, for our way to relate with space and light. The introduction of the terms that have been explained along this chapter allow us to understand the deepness of the future, and makes us stop to consider lighting as a transformation element for our everyday life.



**WHY HOW WHAT**

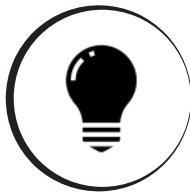
## LI-FI

Li-fi technology or Light- Fidelity, consist of LED Lamp as the media transmission and photo detector as a receiver of transmitted data. Lamp driver is needed to make LED working properly. While amplification and processing are responsible to manage the signal that comes from the photo detector.

As it was being saying, Li-Fi provides transmission of data through illumination, it a wireless optical networking technology, it a visual light communication that provides better efficiency, availability and security than other technologies that we know now a days like Wi-Fi. As the other examples given through this chapter, Li-Fi constitutes a new way of communication transfer, that will impact the dynamic of our daily activities, it is expected to impact in this way every aspect of the world that surround us. The reason why this type of technology is part of this research is not different from the previous case studies, Li-Fi, in this case uses light as a media to function, and this research aims to understand the way lighting will impact spaces; it only makes sense now to take into consideration all the possibilities that this technologies can provide to spaces.

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Li-Fi Technology: Data Transmission through Visible Light. Article. 2015



## WHAT

### LED Lighting

Led lighting is a light-emitting diode, a semiconductor device that emits visible light when an electrical current pass through it. It is essentially the opposite of a photovoltaic cell (a device that converts visible light into electrical current). In addition to the technical terms, LED lighting is one the great advances and discoveries in the lighting industry; LEDs are the result of a quest to improve not only the lighting characteristics but the functionality of them.

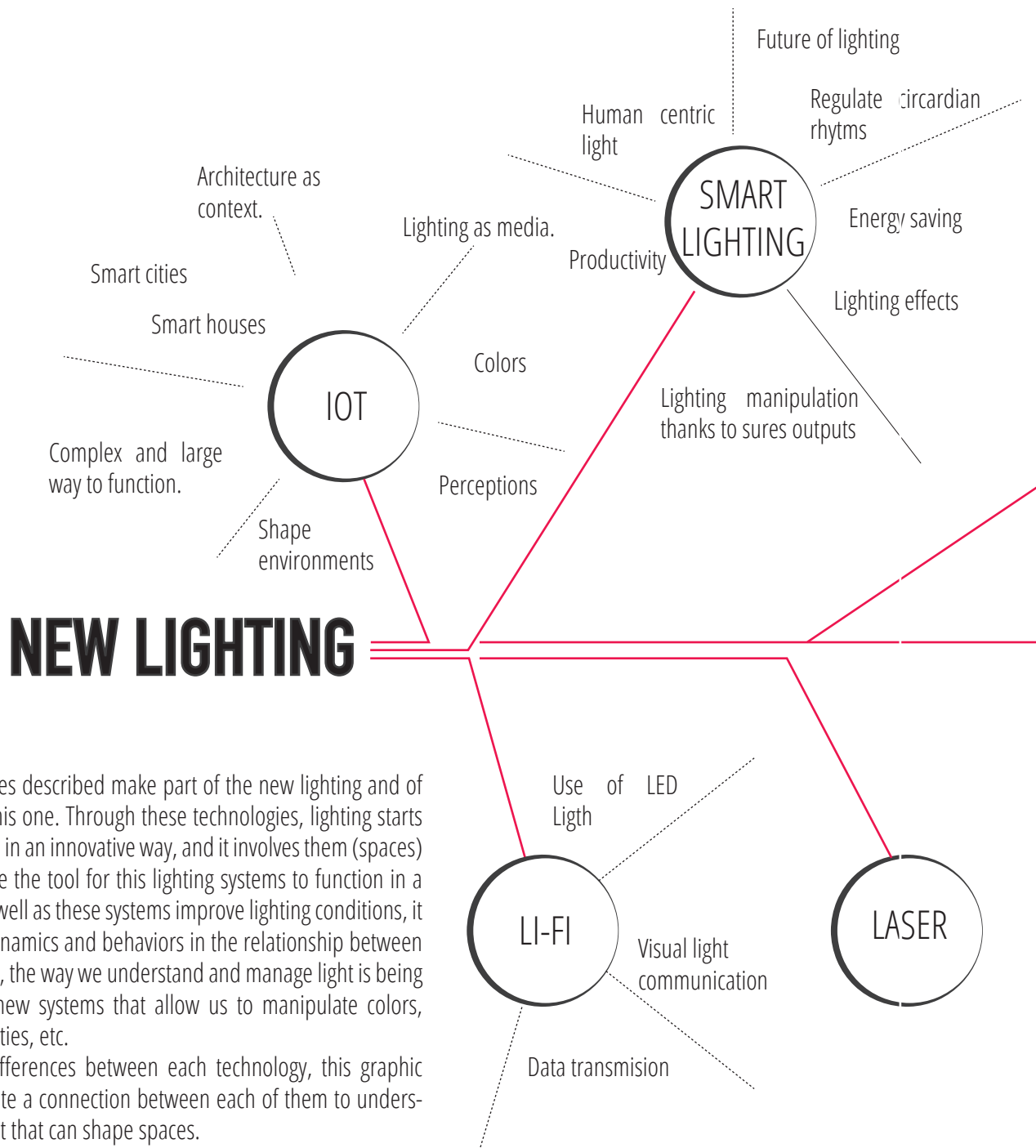
LED lightings “LEDs are small, solid light bulbs which are extremely energy efficient and long lasting. LEDs operate differently than traditional incandescent light bulbs. LED light is a fixture capable to perform in very flexible ways, maintaning the high quality of lighting characteristics. Is a small type of light, with a high energy efficient, able to provide illumination in a better and longer time than actual lighting fixtures, it has given in the other hand the opportunity for lighting to experiment with colors that create an impact in the media that perceive them (spaces and people).



## LED Lighting

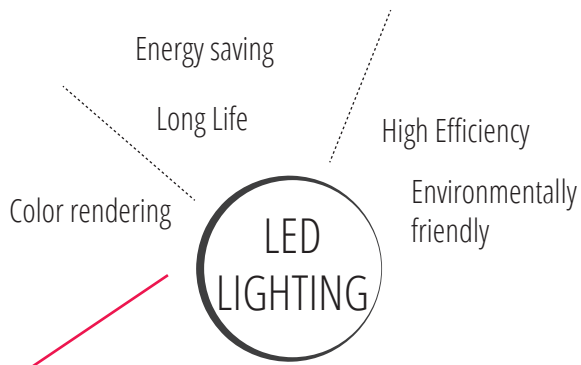
As it was being explained LED has qualities like Energy efficiency, long lifetime, no warm-up period, directional, excellent color rendering, environmentally friendly and controllable. However, one of the aspects that make very relevant this technology is the fact that thanks to the characteristics of this type of illumination the other technologies explained through this chapter became possible. IOT, Smart Lighting and Li-Fi technologies have as a requirement almost the use of LEDs. Further more the combination of all these technologies have create a more important effect in lighting and spaces. The fixtures and the complex systems in which they function, make possible the opportunity to manipulate light, to transform it and through this create atmospheres and all types of effects in spaces and in the users that live in them.





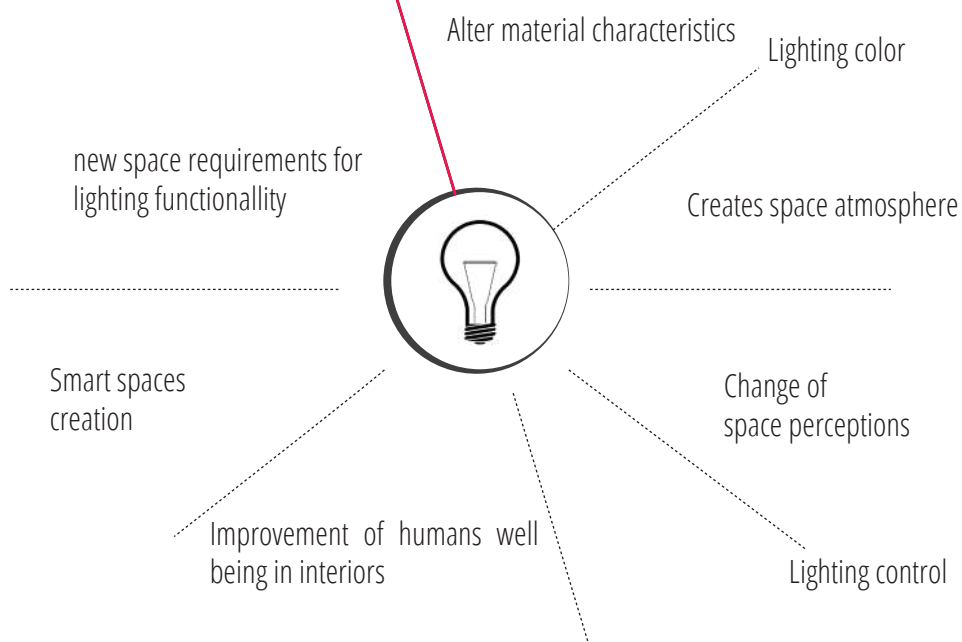
The technologies described make part of the new lighting and of the future of this one. Through these technologies, lighting starts shaping spaces in an innovative way, and it involves them (spaces) as they become the tool for this lighting systems to function in a better way. As well as these systems improve lighting conditions, it creates new dynamics and behaviors in the relationship between light and space, the way we understand and manage light is being transform by new systems that allow us to manipulate colors, shapes, intensities, etc. Despite the differences between each technology, this graphic intends to create a connection between each of them to understand the impact that can shape spaces.

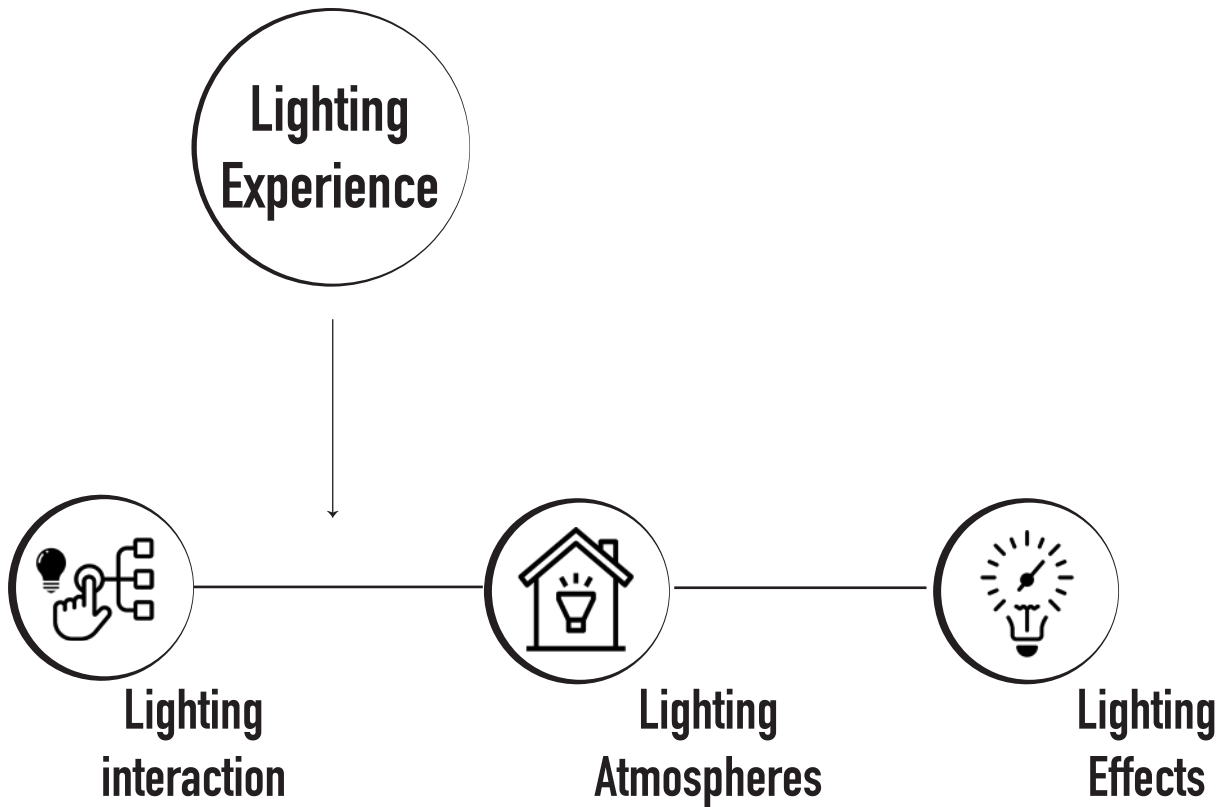
Li-Fi Technology: Data Transmission through Visible Light. Article. 2015



New lighting technologies depend on the development of better lighting fixtures that can incorporate more sophisticated systems

The new lighting technologies far beyond improving the qualities of light will be connected to spaces as the influence in them will become wider; the option to control the characteristics of lighting will change at any moment the perception and characteristics of the spaces. As well the tool used by design to give character and well being to the users of a space, will be provided by the lighting qualities, even more lighting, will manipulate create emotional and physiological rhythms that will altered even more our perception on spaces.





Until now, this research has tried to investigate the function and evolution of lighting over time and through the different systems that make it up today. This information has allowed us to understand part of the important advances that this industry has had. The advances contemplated and analyzed so far are closely related to its functionality and the main characteristics that compose them. However, as indicated in the previous chapter, the field of lighting rapidly moves towards other aspects in which it seeks to transcend from lighting as a speci-

fic and unique source of light, to multiple alternatives where interactions can go beyond turning on or off any lighting system. This chapter looks for specific information in this aspect; in interactions, but in those types of interaction closely related to the impact that lighting is capable to generate in a space.

The lighting experience as is name this part of the research, is divided in three aspects; the interaction itself, controlling alternatives, new approaches to lighting, and of course the effects of this alternatives in lighting- space perceptions.





From the discovery of fire until the creation of electric lighting ,with switching systems that allow us to decide when to have or not lighting, when to turn it on and off; we have always had interactions with lighting systems, it's a relationship that has evolved in a natural way, and that has proven that as lighting systems evolve so does our interaction with them. The new lighting is driving again a change in the paradigm of lighting interactions.

Interaction comes in many ways when we speak about lighting; it can be the simple relationship that

we have developed with light in our daily activities, it can be the switch, the phone that now a days manages the lighting systems in our homes, or the simple interaction of perceiving light changes. Despites the fact that all of this interaction can be connected to the subject of this document (lighting and space), this particular part will focus in two main interaction aspects; the control of lighting and the lighting changes that are able to create effects in users and spaces through the manipulation of this lighting control systems; this will give an important insight of how lighting in fact is able to shape and transform deeply the spaces.

User interaction with everyday lighting systems. S. A. M. Offermans, H. A. van Essen, J. H. Eggen. 2014

So far, it has been established that Interaction s come in many ways. Since the discovery of fire until today, interactions have been understood in the way we relate with light in our everyday activities, when we decide when to turn on or turn off any switching system, or even our interaction today through cellphones and other digital tools. It can be clear that as lighting systems have evolved, so has our interaction with it.

The interaction of today and the ones expected for the future, are going on farther as lighting systems are, it is becoming the key for experience creations around light, around the spaces where they develop.

As interaction with light can be a wide subject to analyze, is important to high line the chain of scenarios that can explain better why this particular matter can impact significantly the shape of spaces. So, it has been clear so far, that lightings systems are and will evolved into elements carrying more than light, they will become tools for many more things, this brings different situations where we

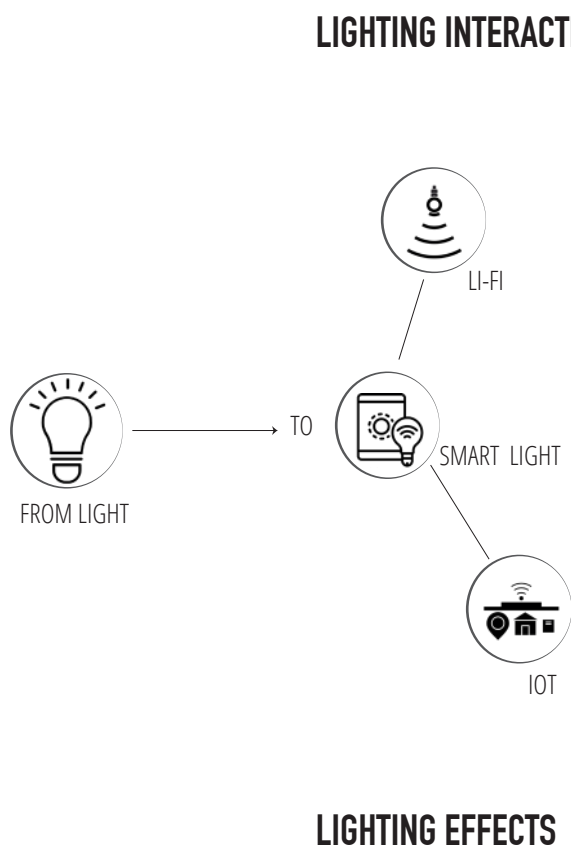
can see for example, how the lighting devices will multiply in spaces; they will become more flexible which will allow them to merge in almost any object. This flexibility and advance in lighting will also mean a flexibility in lighting properties, in lighting options, they will increase the chance to change colors, shapes, functions, directions, etc. Lighting systems, will in fact become so complex and so wide that our way to manipulate them will have to be transformed as well, it will be impossible to manage all this possibility by using just one switch. So, what happens here; new paradigms of interaction are going to be created, we will be able to manipulate freely any illumination device as we need it. Now, why is so important to have the power to shape lighting as we needed? Its not only for us to the decide the when, but the how and since lighting in highly vivid in interior spaces, it will immediately mean a constant transformation in them as well.

**“The potential benefits of this trend result from the increased degrees of freedom that are available. This allows people to create more suitable atmospheres and working environments and as such have different settings for different occasions. Moreover, the increasing knowledge about the effects of light on people allows us to use the emotional, psychological, physiological and social effects of light, as well as to use light to convey information in ambient displays.”**

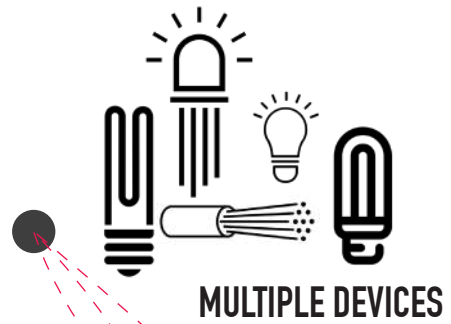
The lighting industry has understood along the years the different components that makes a good lighting device; however, they are moving to another field that helps lighting to go beyond its own limits; it is starting to care even more about the way lighting manifests in our surroundings, about the effects (besides the obvious ones) that lighting has the power to create. Yes, colors, shapes, intensity of light will play with our space perception, they will make spaces more comfortable,

warmer, they will shape any space atmosphere as we want it to be. But these will open possibilities that so far, we were only able to make somehow through a good interior space design, through good architecture, and it to stimulate the well-being of spaces through light. For example, the light in an space will be able to work according to the use of the space, synchronizing our natural cycles and relations of light (circadian rhythms) , with the space characteristics in order to create a different perception in a user to help, for instance in the productivity that this person can has in his/hers working place.

Two main aspects are relevant in this part of the research in order to answer the main question set at the beginning of this thesis; Lighting and space, need from a user for them to be understood, and lived, therefore the attention in the effects and in their influence in people are indispensable, and moreover through this chain of situations, we can only conclude that lighting will play a more significant role in space, more than what it does nowadays, and more importantly, that lighting will become a tool to shape and transform constantly in real time these shapes of spaces.



New lighting will involve the participation of multiple devices with controlling, function and space requirements for their proper job.



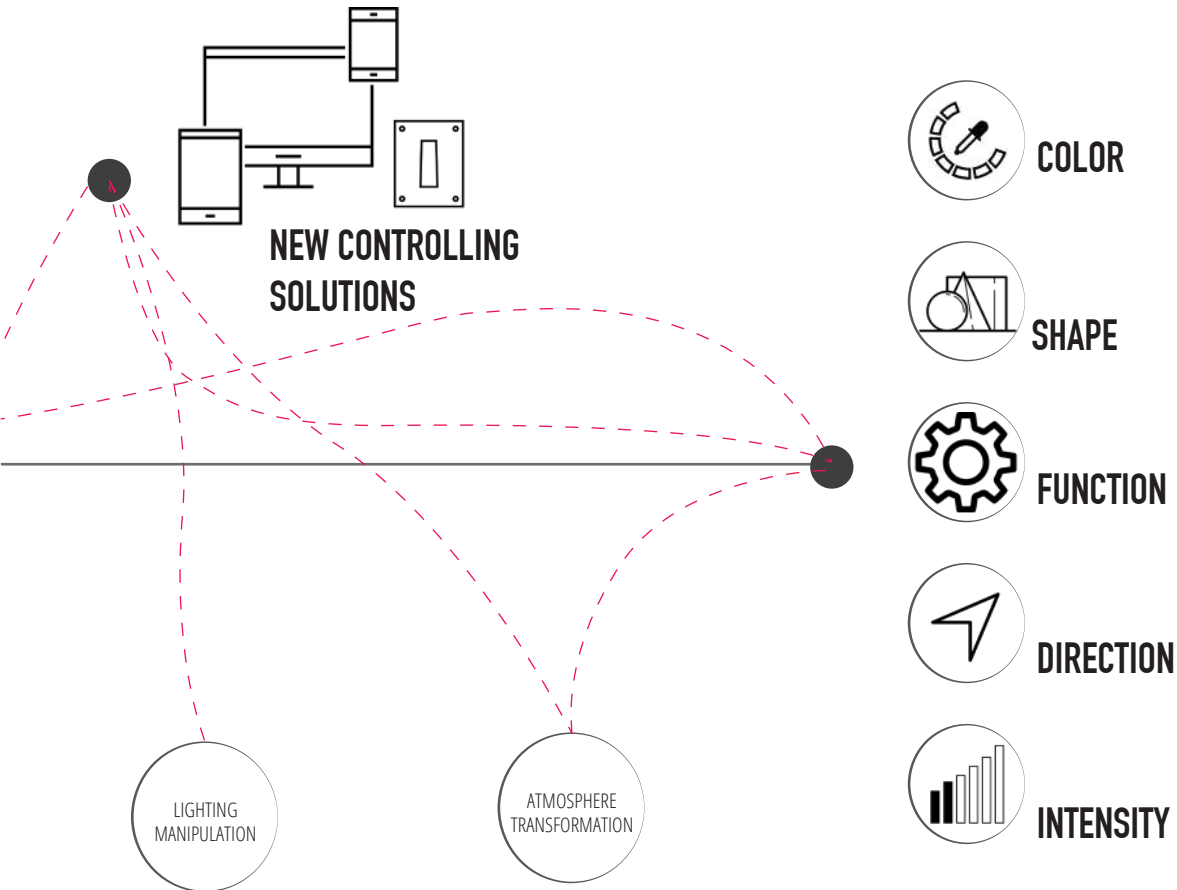
Spaces will contain many lighting sources that are embedded in dedicated armatures, but that will also be in furniture and even in our walls and ceilings.



Ambient intelligence would allow devices to work in concert to support people in carrying out their everyday life activities, tasks and rituals in an intuitive way using information and intelligence that is hidden in the network connecting these devices.

User interaction with everyday lighting systems. S. A. M. Offermans, H. A. van Essen, J. H. Eggen. 2014  
[https://en.wikipedia.org/wiki/Ambient\\_intelligence](https://en.wikipedia.org/wiki/Ambient_intelligence)

Lighting fixture will demand a more complex control that will transform lighting interaction and that will give freedom to the users to manipulate many more aspects of light.



The combination of the increased amount of individual light sources and the increased degrees of freedom creates a huge amount of parameters to control but that allow us to use lighting

# PHILIPS

## Onespace Luminous Ceiling



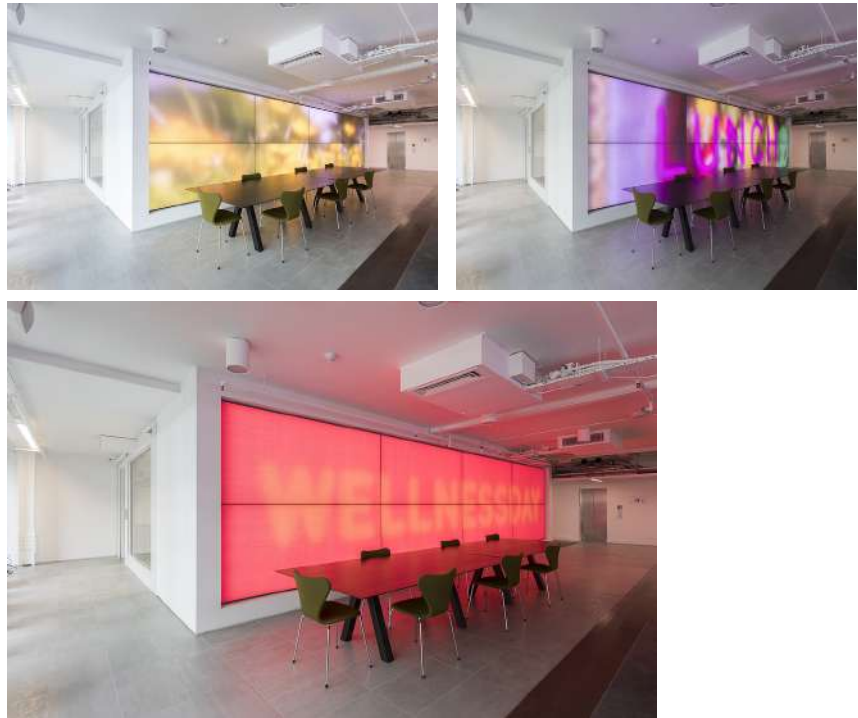
After re-thinking the ceiling, it is now a blank canvas awaiting your vision. Philips revolutionary OneSpace luminous ceiling prefab is an impressive ultra-thin and compact standard unit that liberates you from the constraints of conventional ceiling design so you're free to pursue uncluttered minimalistic visions - and transform any interior into one cohesive space with beautiful homogeneous light. The result is a ceiling unit with an amazing light effect without seeing the light source.

**"The ceiling becomes the light, the light becomes the ceiling"**

[https://www.archdaily.com/catalog/us/products/15271/philips-onespace-luminous-ceiling-signify?ad\\_source=neufert&ad\\_medium=gallery&ad\\_name=close-gallery](https://www.archdaily.com/catalog/us/products/15271/philips-onespace-luminous-ceiling-signify?ad_source=neufert&ad_medium=gallery&ad_name=close-gallery)

# LUMINOUS TEXTILE

With Kvadrat Soft Cells



Luminous textile is a revolutionary way to enhance interiors with light, texture and dynamic content to bring spaces alive. The panels are available in a wide range of sizes. They're easy to install and can be controlled from a computer or mobile device. Featuring energy-efficient LED technology and Kvadrat Soft Cells, they also improve acoustics.

**"The LED lighting panels become the wall finishes"**

[https://www.archdaily.com/catalog/us/products/15272/luminous-textile-with-kvadrat-soft-cells-signify?ad\\_name=related-products-bottom](https://www.archdaily.com/catalog/us/products/15272/luminous-textile-with-kvadrat-soft-cells-signify?ad_name=related-products-bottom)

# COELUX 60



Coe Lux represents a perfect reference for an artificial lighting able to recreate natural lighting cycles in interior spaces. It is as well able to create an experience around its purpose, where well-being sensations in space users is produce.

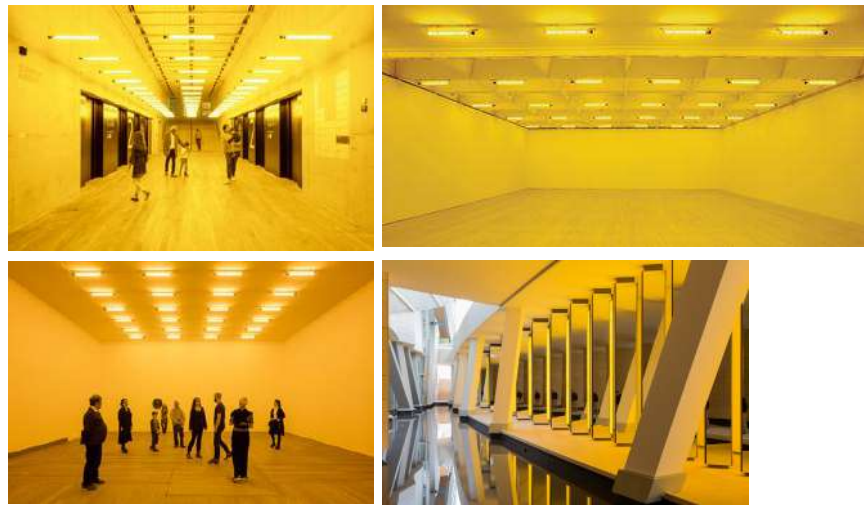
Furthermore, this lamp become the proof of how lighting will merged in spaces and almost replacing space elements such as windows, in here artificial lighting becomes an architectural element capable of providing a natural light effect.

**"The ceiling becomes the light, the light becomes the ceiling"**

[https://www.archdaily.com/catalog/us/products/15271/philips-onespace-luminous-ceiling-signify?ad\\_source=neufert&ad\\_medium=gallery&ad\\_name=close-gallery](https://www.archdaily.com/catalog/us/products/15271/philips-onespace-luminous-ceiling-signify?ad_source=neufert&ad_medium=gallery&ad_name=close-gallery)



# LIGHTING ATMOSPHERES



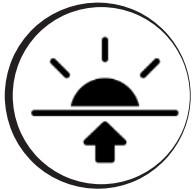
“Room of one color” Olafur Eliasson.

Lighting has always been responsible for a big part of a room's atmosphere, however the future of lighting will make lighting almost fully responsible of the atmosphere and environment of interiors.

Lighting technologies are developing dynamics of colors, intensities that allow the space to transform from a cold lighted room into a reddish, cozier one.

The future in this sense will allow users to recreate spaces by “producing” their own light, and with this lighting will become almost the material for space transformation.

The emotional response of design and architecture will transcend from shapes, colors, forms into brightness, contrast, atmospheric flexibility,



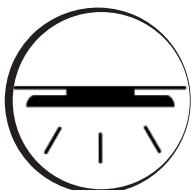
NATURAL LIGHTING  
EFFECTS IN INTERIORS



ATMOSPHERE  
MANIPULATION



SPACE UNDERSTANDING



LIGHTING AS SPACE

In order to improve the lighting conditions, the future of lighting starts by contemplating the idea of promoting the circadian experience, and with this recreate the cycle of the sun in the interior spaces, to improve the performance and the relationship of people with spaces.

“New lighting features will provide new interactions and manipulation that will allow the control of atmospheres in interior spaces through the change of lighting intensity and lighting color.”

“Connected lighting platforms will be able to understand who’s within a space, what are they going, when they are doing it, and why they are doing it-delivering a centered contextually aware environment to users.” Corey Egan.

The versatility of new types of lighting fixtures will allow them to become part of the space in a completely new way. “Lights may cease to look like lights at all, instead of accessorizing spaces, they’ll be fully integrated with them.”

**“Architecture is the wise, correct, and magnificent play of volumes collected together under the light.”**

Le corbusier.

Thesis Incubator Studio

# 08

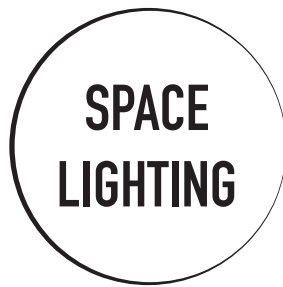
**CREATION**  
SPACE LIGHTING

# SPACE LIGHTING

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So far, this research has been focused in the explanation and exploration of the lighting subject, an exploration through the general characteristics of it, and the direction that lighting has and will take in the future. Despite the exploration path that has been taken until now, there has been a constant relationship with the space and the effects on them. This chapter will focus in this last matter, in the space, the impact of lighting seen by the space perspective, and the different scenarios that allow us to see and understand better how lighting can become a space, or how spaces meant for lighting exhibition work. Hopefully at the end of this chapter the relationship that has been explored through this document will become even more clear.

**All aspects of the space, including colour, form, volume, function, and program, are associated with objects and viewers through the lighting situation.**



**Space-lighting  
perception**

**Lighting as  
space**

As it was mentioned in the introduction of this chapter; besides the focus on Space-lighting, this part of the research will be divided in two main aspects, the first one will be focused in those elements that change our spatial perception, that are able to shape it, and how they are able to do so; elements of course deeply connected to lighting. Is important to pause here and review an aspect of this research to avoid confusions. Yes, in fact some aspects of lighting previously presented affect the perception of spaces; lighting has a wide impact in every context which can make difficult the entire comprehension of this matter.

The perceptual aspects of lighting that are intended to be explained in this chapter, are related to the effect that a lighting fixture in its particular function affects the different spatial elements (spatial understanding, materials, textures, etc.). The other aspect that divides this chapter is related to the spaces meant for illumination, the actual lighting spaces, this is a term use along this research to explain precisely those spaces that are born from a lighting intention or necessity, this part of the research seeks to present some references or case studies that can help to understand the application of lighting as the main spatial element.

One of the main aspects that lighting has the power to change as we experience it, specially when we speak about spaces, is the perception. Lighting has the ability to provide spaces with qualities that help us understand spaces characteristics, sizes, colors, etc, while it provides us with an emotional charge that connects us to the space we are seeing.

To go deeper into this matter is important to understand that perception is a belief, or opinion, often held by many people based on how things seem; therefore, as it is mainly an opinion, when we speak about perception we speak about subjective interpretations. Subjective as they involve different aspects; the physical conditions, the cultural background, the ages, among many other things.

The team work between lighting and space are able to create reactions that can be defined as aesthetical or emotional reactions. "The aesthetical response requires attention to the entire area and is an expression of immediate reaction such as good or bad, too bright or too dark. The emotional reaction, on the other hand, is an expression of a feeling that occurs after being present in the environment for

some time.

Emotional reactions are related to the combination of many senses such as pleasantness, relaxation, depression, etc."

To speak of perceptions, is to speak as well about lighting effects. Why? Because perception changes can be considered as a result of the effects that lighting fixtures are able to create. Explained this, it is important to dig more in the aspects of lighting effects, to see then how in fact this are able to alter our space-light perceptions.

So,Lighting effects, is a well-known concept, especially in the field of design, still, it becomes very difficult to find a punctual definition of what lighting effects are; instead it is very usual to define an effect of this kind through metaphors or technical terms that imply the techniques. "wall washing for example is a metaphor the evokes que effect of water or fluid running down a surface." Since it is very difficult to define or to extend the definition of lighting effects without using a comparison or reference to a light

fixture characteristic, it will be presented right ahead and analogy written in the document of “Light Effects in the Design Process”.

“an analogy with architecture is useful to grasp the concept of light effects and to demonstrate the usefulness of identifying types of light effect and defining their specificity. Construction materials (wood, steel, bricks and mortar) are tools of architecture and one segment of architectural scholarship involves the mastering of their properties and the possible synergy between them in order to achieve structural compositions of strength and quality. Different types of opening (skylights, sash windows, glazed façades, portholes, slots) are also tools of architecture with distinctive identities, and their employment in architectural compositions signifies values additional to the obvious functional ones: the need to air a space or let daylight in. Their role, apart from the functional, can also be valued as defining the style of a building regardless of the materials they are made of (but also giving a special style to the building because of the special quality of light they let in).

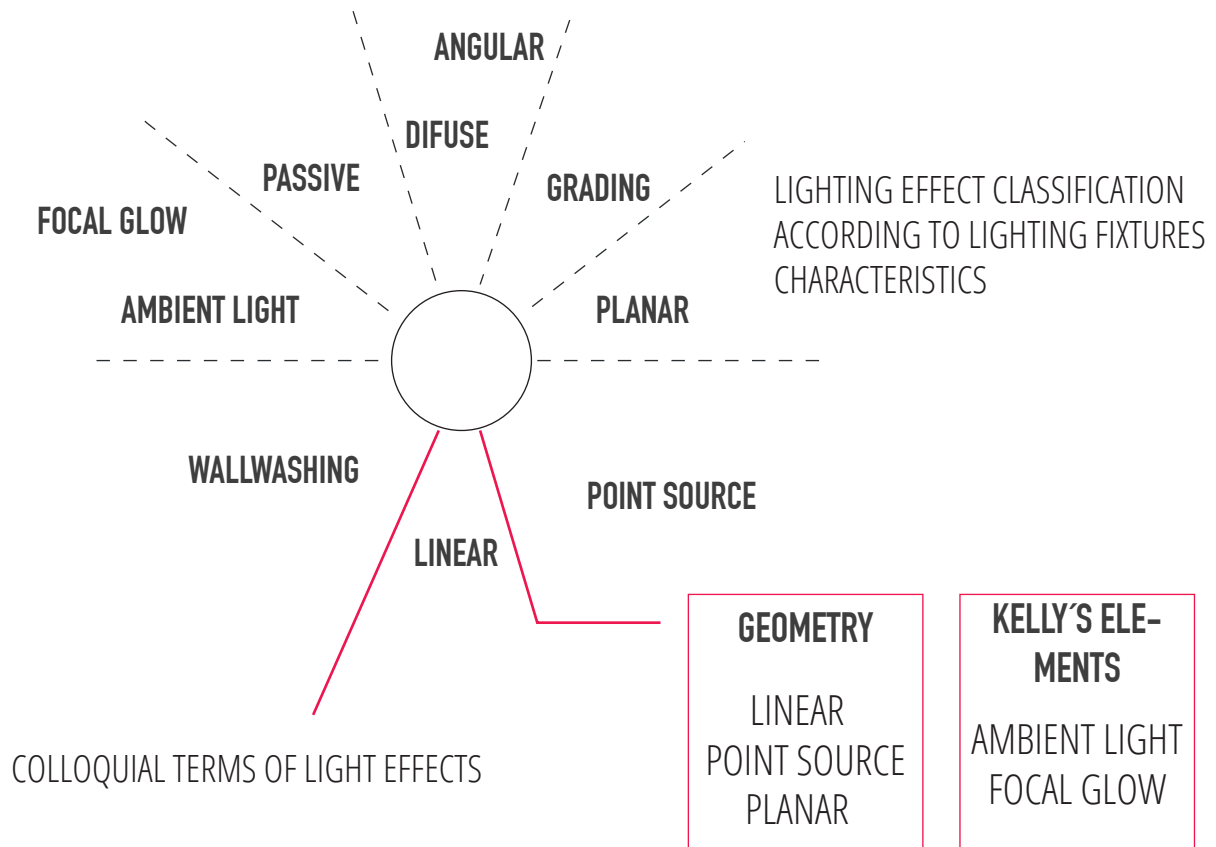
It is the configuration of the constituent materials of a window that proves its identity. We therefore may say a type of window.

In an analogy, a light effect gains its identity from the appearance of light space it offers and not only from its technical characteristics.

Irrespective of the type of source, the effect holds its basic characteristics: its configuration and appearance of the continuously washed surface. The way the sources are arranged in the holding architectural envelope can result in a ‘cove lighting’ effect. The configuration of the surface that ‘receives’ the emitted light can also contribute to it.

Therefore, a light effect can hold its identity independently from its generating material constituents but it depends on the arrangement of those constituents in space and the configuration of the ‘receiving surface’ that renders them visible.





Classification of lighting by characteristics

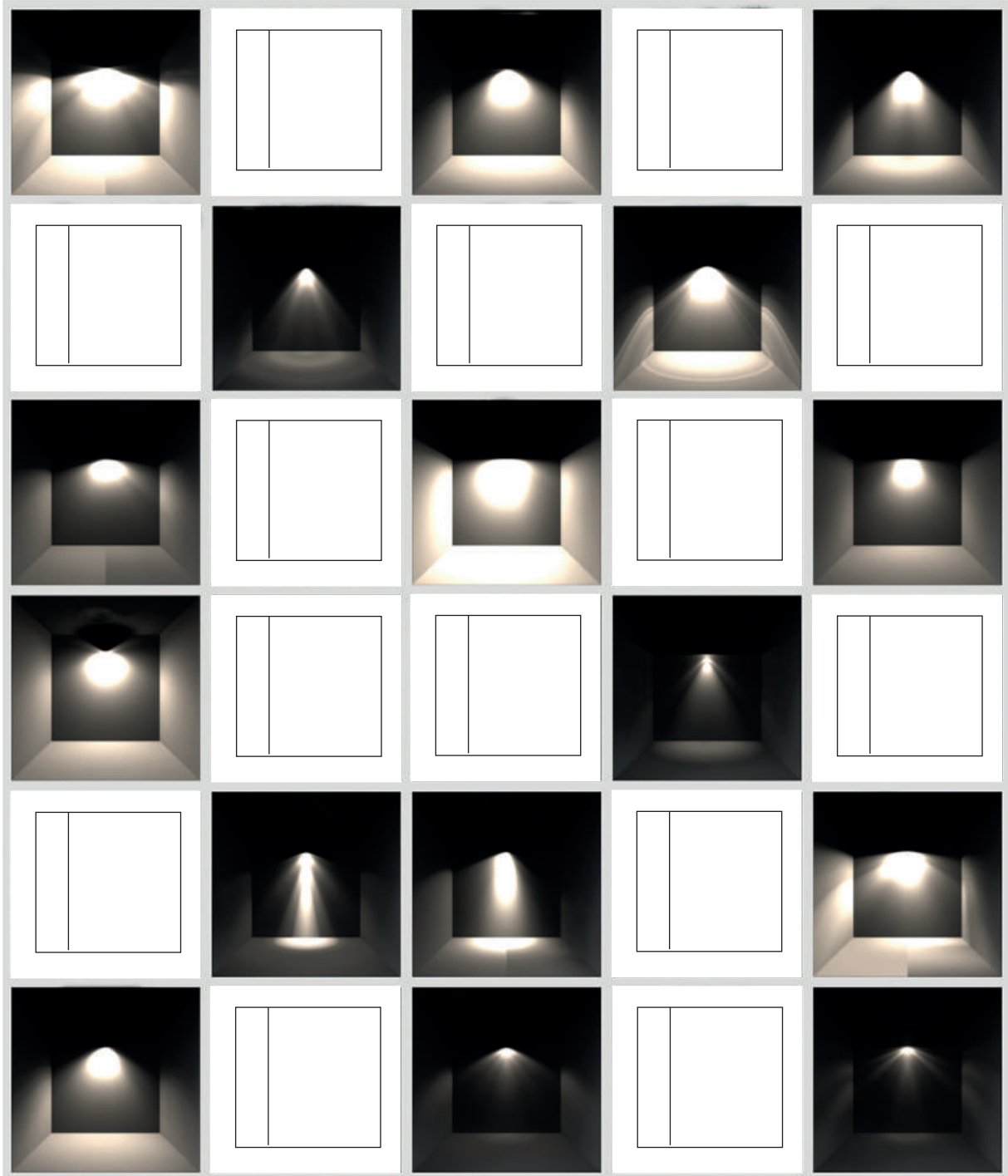
There is despite this, an important fact surrounding this theme; " Lighting effects are observable phenomenas which equally depended on the source that produces the light, its arrangement and the space configuration that accomodates them."

Lighting effects and the perception gained by it, provide important information through lighting characteristics; a cove lighting that produces a clean and linear effect that highlines the joints of a space, defining its limits, proportions and shape, that give to the viewer at the same time a sense of direction and orientation for example.

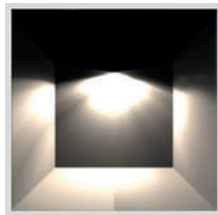
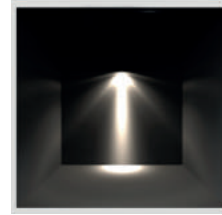
Or a wash wall able to create a subtle effect of water like sensation on the surfaces.

The lighting effects are caused by other aspects of the lighting properties brightness, colors, contrast play an important reaction in the spaces, where all of this aspects are combined with environments, objects and material to create the different spatial perceptions.

Light effects in the Design Process. A theoretical investigation of designers perception of lighting effects and an empirical study of how the use them in architectural lighting design. Alkistis- Zoi Skarlatou. London. 2010



Lighting fixtures effects in spaces.



**BRIGHT LIGHTING**

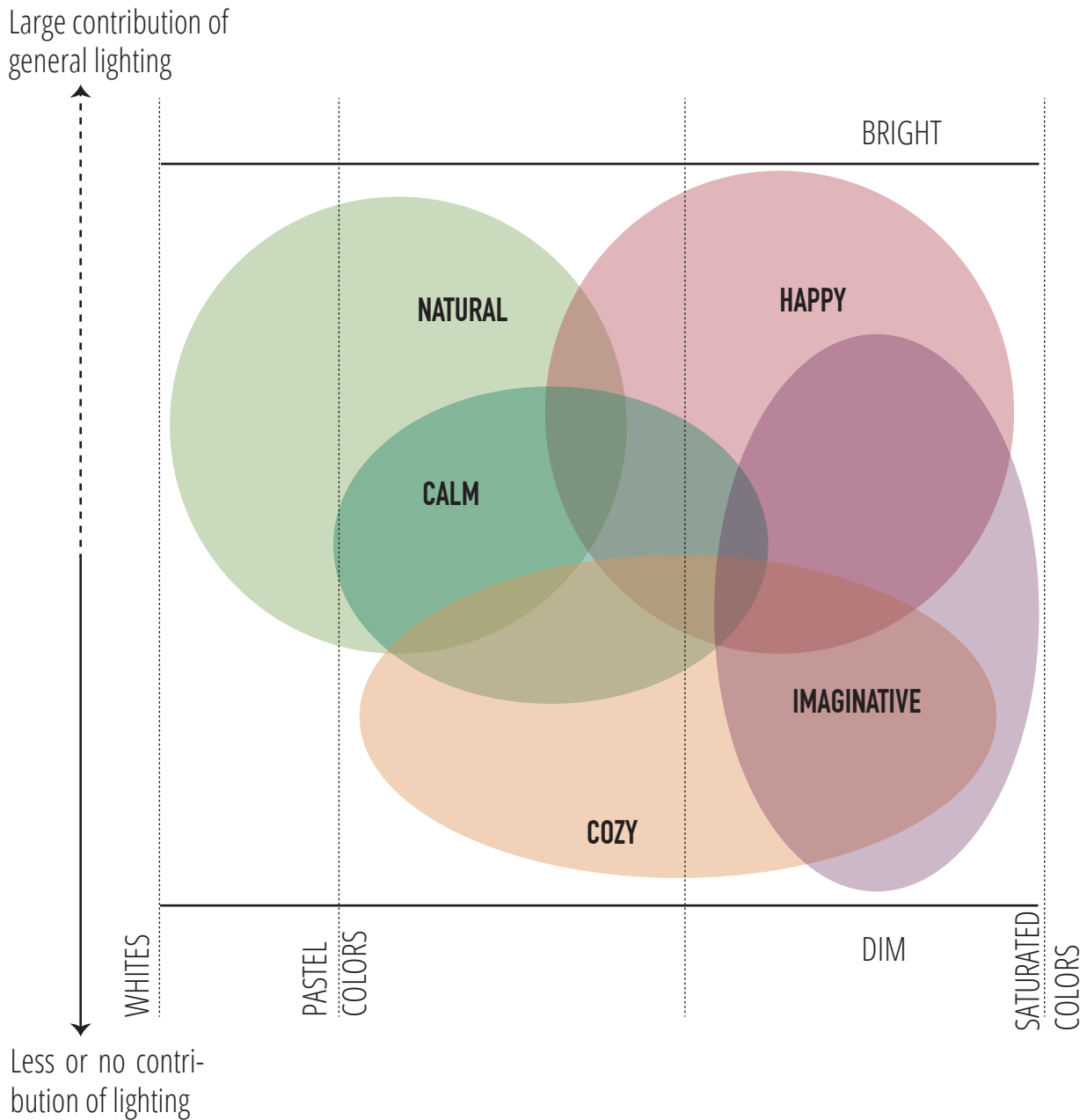
**LOW LIGHTING**

**WALL WASH**

The image shown previously, represents a series of lighting fixtures, all with different characteristics, placed in the same type of space. This exercise allows to understand how lighting is an element that offers clarity, distribution, and that a light across the space may affect the overall impression of a space.

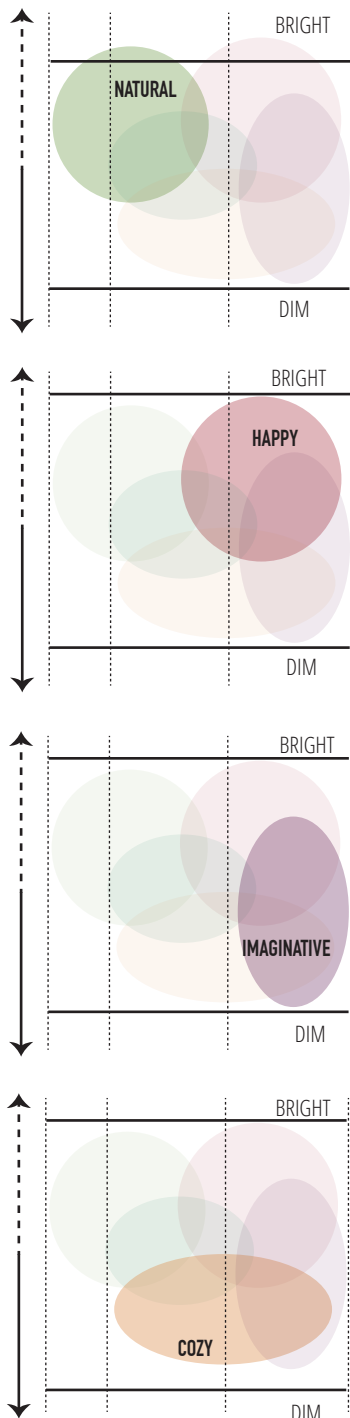
For example, the first images on top presents a bright level and an even lighting distribution, that is able to attract attention and create a feeling of spaciousness. Another example, is for instances the space with low and uneven levels of lighting distribution, which creates in the space an intimate atmosphere.

Or the wall wash type of lighting that has been mentioned in several occasions; a light effect that gives to spaces an impression of clarity and order. Like this all lighting fixtures are able to manipulate an impression of any space. In addition to this, it has been mentioned here the capability that lighting has in order to create atmospheres, not only thought the distribution of light but by the possibility that new lighting characteristics have in terms of colors, and brightness; the following graphic will try to illustrate better this aspect of lighting effects.



The term "atmosphere" has been used in the meteorological field and refers to the earth's envelope of air. It is only since the eighteenth century atmosphere started to be used as a metaphor for describing moods which are 'in the air' - an emotional tinge of an interior space.

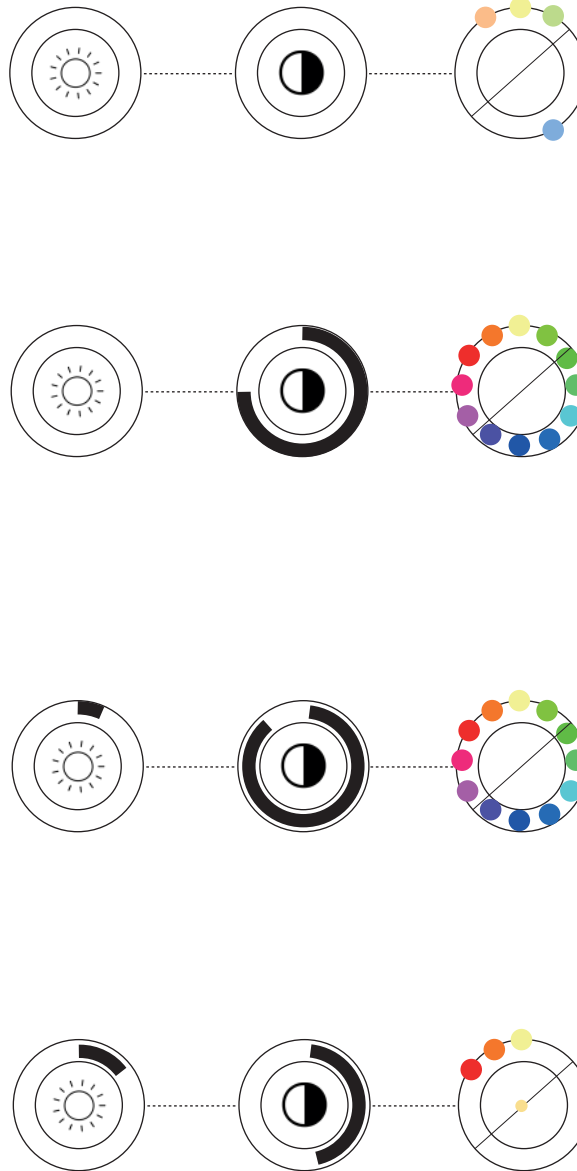
<https://www.youtube.com/watch?v=ExYsEH7zRLY&t=67s>



**BRIGHTNESS**

**CONTRAST**

**COLOR**



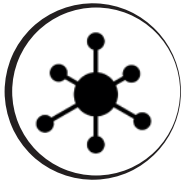
Space atmospheres, are created by the combination of lighting brightness, contrasts and lighting colors; all of them are part of the aspects that change space perceptions through lighting.

<https://www.youtube.com/watch?v=ExYsEH7zRLY&t=67s>

# PUERTA AMERICA HOTEL

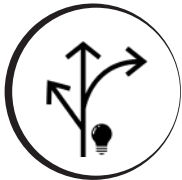


The hotel Puerta America is an example for lighting perception transformation; a cove type of lighting was used in to high line particular aspects in the space, however the combination of the environment in which they are inserted, allow each space to transmit a completely different environment and therefore a reaction, a perception. Besides, lighting in here becomes part of the joins of the space, giving the perception of a lighting inmersion in space.



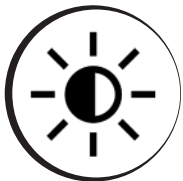
LIGHTING DISTRIBUTION

Lighting distribution is a main aspect for our spatial experience, part of our vision that supports orientation and spatial perception works by reading fields of contrast and differences in shade.



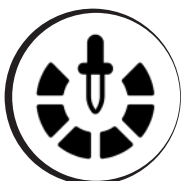
LIGHTING DIRECTION

The directions of light, proportions of illuminated areas and level of light from one space to another, play an important role for our spatial understanding.



BRIGHTNESS CONTRAST

The contrast and brightness of lighting allow objects in the space to gain depth and therefore allow us to understand better a space shape, and the different elements that overlap with each other.



COLOR

Within the field of lighting, distribution, color and level of lighting are the most important lighting factors. Spaces need non-uniform lighting, that enhances their purpose and create a cost-effective way to increase spatial and spacious experience.

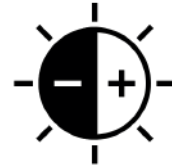


## LIGHTING EFFECT

The lighting effects are related to the quality of color, contrast, brightness.

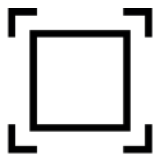


## COLOR



## CONTRAST

## BRIGHTNESS



## EFFECT IN SPACE

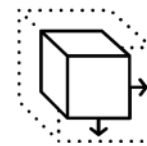
The effect in space related to the interaction with environment, objects and materials.



## OBJECTS



## MATERIALS

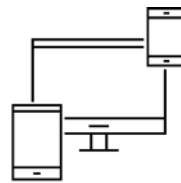


## ENVIRONMENT



## LIGHTING EXPERIENCE OVER TIME

The lighting experience over time related to dynamic light, IOT, etc.



## DYNAMIC LIGHTING



New lighting can create color degradations, can create perceptions related with tonal shades.

## RITCHNESS

### DEPTH

### LIGHTNESS

Multiple devices related to space working harmoniously in space.



To create experiences  
in spaces

## LIGHTING MANAGMENT

Dynamic lighting will allow to create natural lighting effect on the inside.

Space lighting will change according to our routines.

Stage the light experience at home.

This graphic presents the connection that has been explained along this document, how the connection between lighting, its evolution has and will create an important repercussion in the spaces in many levels.

**“work is not about light, or a record of light; it is light – the physical presence of light made manifest in sensory form.””.**

James Turrell.

# LIGHTING AS SPACE

After analyzing the different ways in which lighting intervenes in spaces, this part of the research will try to present different scenarios of lighting spaces; spaces in which lighting is the tool that creates the character and shape of spaces. Lighting- spaces can embrace many fields of impact, in fact, as it has been evidenced during the development of this research, every space is impacted by lighting qualities. Despite the multiple scenarios in which lighting develops. For this matter, the following part of the research will concentrate y three main scenarios: Art, Interior spaces / architecture and finally on spaces developed for lighting exhibition. The reason why these three subjects have been chosen are the following: Art has become an important tool and reference for lighting experimentation; movements and artist are presenting innovative ways that conceive spaces by the use of lighting.

Artist have always research lighting as an important element for their paintings and works of art; Impressionism, for example, was one of the largest and most influential, famous for its recording of the passing moment through light changes on the built or natural environment.

It is not the intention of this research to make a deep search in the influence of art in lighting-spaces; however, it is important to understand the different ways in which lighting has actually been applied. On the other side is Interior design and architecture; they are the main purpose of this research and since is the interest of this research development to arrive into an interior design project it is indispensable to take into consideration the background and the references related to this matter. Last, but not least, in the interest of creating as well a project that can combine the findings of this research, with interior design and of course with Zafferano; this last part of the chapter will try to present different scenarios for exhibitions, scenarios, spaces meant for lighting presentation; hopefully to arrive into a project that can represent the brand and the join of forces between Politecnico di Milano and Zafferano.



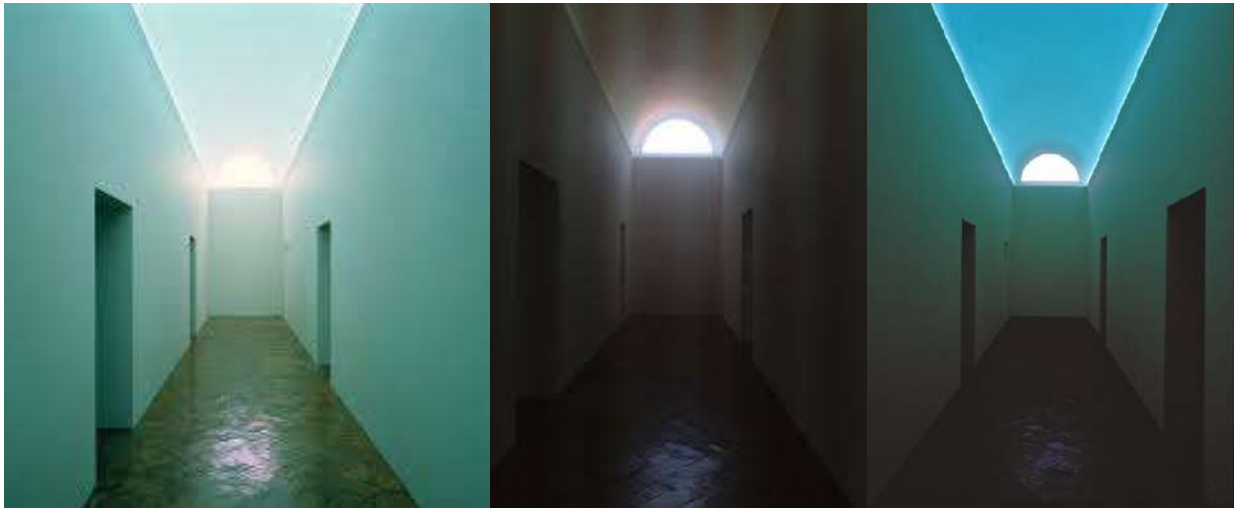
To speak about art and light could imply a new, a completely different research discussion; therefore, the relationship between art and lighting space will be focus in particular references and movements that reflect the use of lighting as a tool to shape installations, art exhibition spaces. By studying some of the artistic movements that could be related with the subject of this research, the Light and Space movement became absolutely relevant. During the 60's was born a concern about how geometric shapes and use of light could affect the environment and perfection

of the viewer. The main characteristic of this movement lies in conceiving and presenting the works of art to the public such as two dimensional canvases compared to three-dimensional light installations, but it also lies deeper, in recognizing the subjective nature of light and bringing it forward.

"The light sources are not a stand-alone, self-sufficient composition that could be transferred from gallery to gallery, but they are studied and positioned for specific places only, the contours of the clean architectural volumes, washing them in tints, revealing their features and letting them be revealed by them."

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Light effects in the Design Process. A theoretical investigation of designers perception of lighting effects and an empirical study of how the use them in architectural lighting design. Alkistis-Zoi Skarlatou. London. 2010



The Light and space movement, takes then spatial elements and transform them into lighting elements able to alter the perception of the viewer. As well, part of their work correspond to the replacement of materials through alternative ones in which lighting was the protagonist (lighting as a material).

“The Light and Space group’s projects, explore light and perception in three-dimensional spaces, usually in internal spaces or landscapes for their own private use, and not in gallery

rooms, by bringing the viewer inside the modified space to experience the work of art with his/her own body and senses, whereas painting and sculpture present either two-dimensional recordings of seeing light (Adcock 1990) or occupy the three-dimensional space with strong relations to the ‘object’ and not the containing space. Light and Space works do not present the object to the viewer but instead insert him into the work of art rendering him ‘the subject’.”

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Light effects in the Design Process. A theoretical investigation of designers perception of lighting effects and an empirical study of how the use them in architectural lighting design. Alkistis- Zoi Skarlatou. London. 2010

<http://artobserved.com/2013/08/houston-james-turrell-the-light-inside-at-the-museum-of-fine-arts-houston-through-september-22nd-2013/>  
<https://www.mfah.org/exhibitions/james-turrell-retrospective/>  
<https://www.mfah.org/art/detail/42358>

# LIGHTING AS SPACE

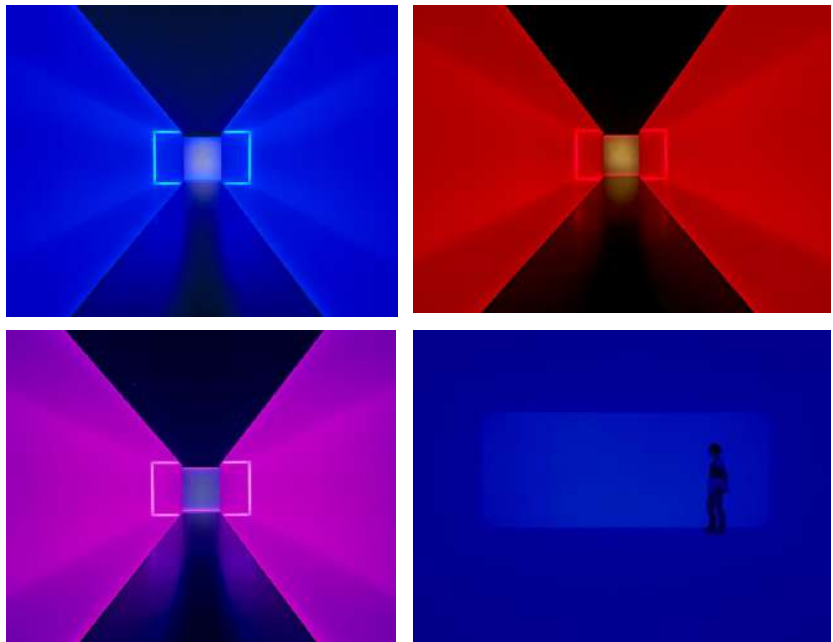
James Turrell

A light- inspired artist, James establishes that “Light is a powerful substance, we have a primal connection to it, but for something so powerful, situations for its presence are so fragile.. my desire is to set up situations to which i take you and let you see. it becomes your experience.”

“We spend our lives immersed in ever-changing environments of light, where no two moments are ever quite the same. Whether it’s a cloud acting as a gauze over the sun, a glorious sunset or a total eclipse, we tend only to notice the most pronounced effects of light, and ignore the constant flux of conditions that plays out in our everyday existence. However, it is just these shifts in our perceptions that the work of Arizona-based artist James Turrell (b. 1943) has been drawing attention to for over half a century. Creating work with light as its principal medium and object. Turrell makes immersive environments that encourage the viewer to be more aware of changes in the illuminated landscape and, by extension, the act of observation itself. ”

# LIGHTING AS SPACE

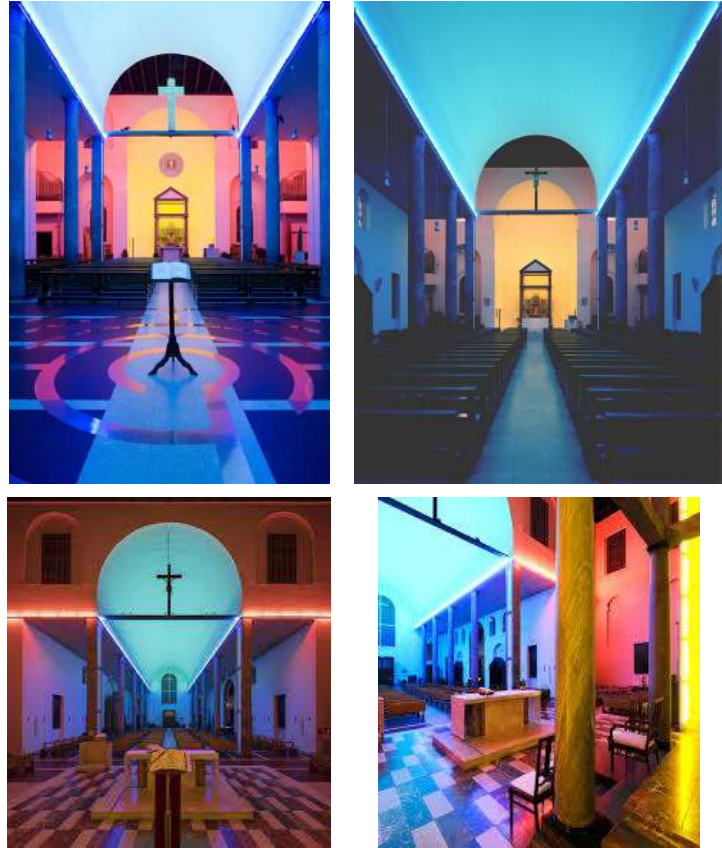
James Turrell



The light Inside exhibition

“The light Inside” turns walls into tunnels to conduct light. It transcends the traditional limits of built spaces. The disposition of an elevated platform, and the changing cycle of light invites to contemplation and gives the sense of floating in the air. He turns this crossing path between buildings an exploration of light and space through an impressive experience.

# CHIESA ROSSA



Dan Flavin

“With green, blue, pink, golden and ultraviolet light, constitutes the sole source of illumination and permeates the entire space, accompanying visitors. Walking through the entryway, the chromatic succession of the nave, transept and the apse suggests the natural ‘night-dawn-day’ progression of light.”

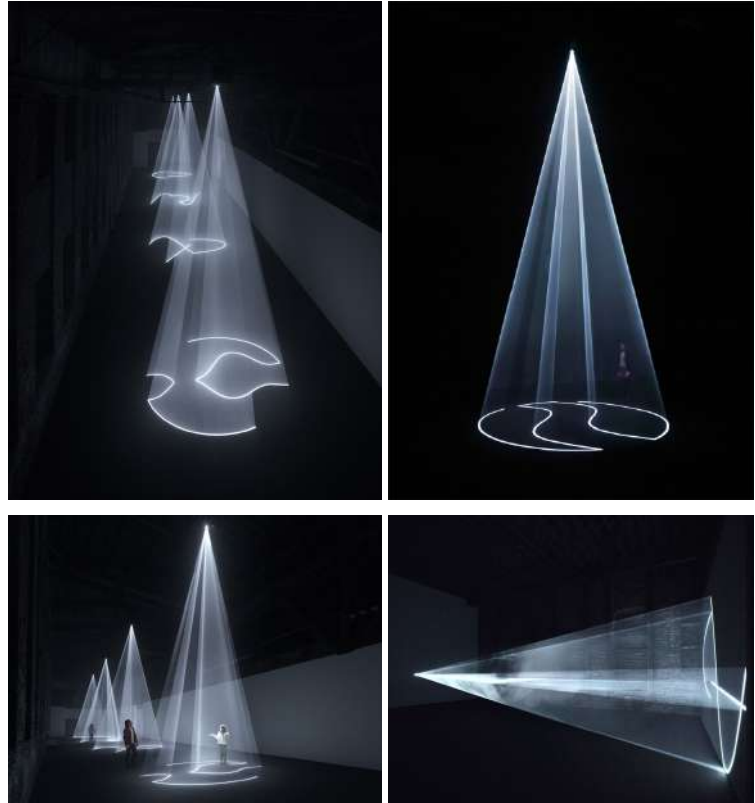
The neon lighting used for this installation, meets the geometry of the architectural elements and merges in them to create a completely new atmosphere in the space. In here lighting becomes the material.

<http://www.fondazioneprada.org/project/chiesa-rossa/?lang=en>



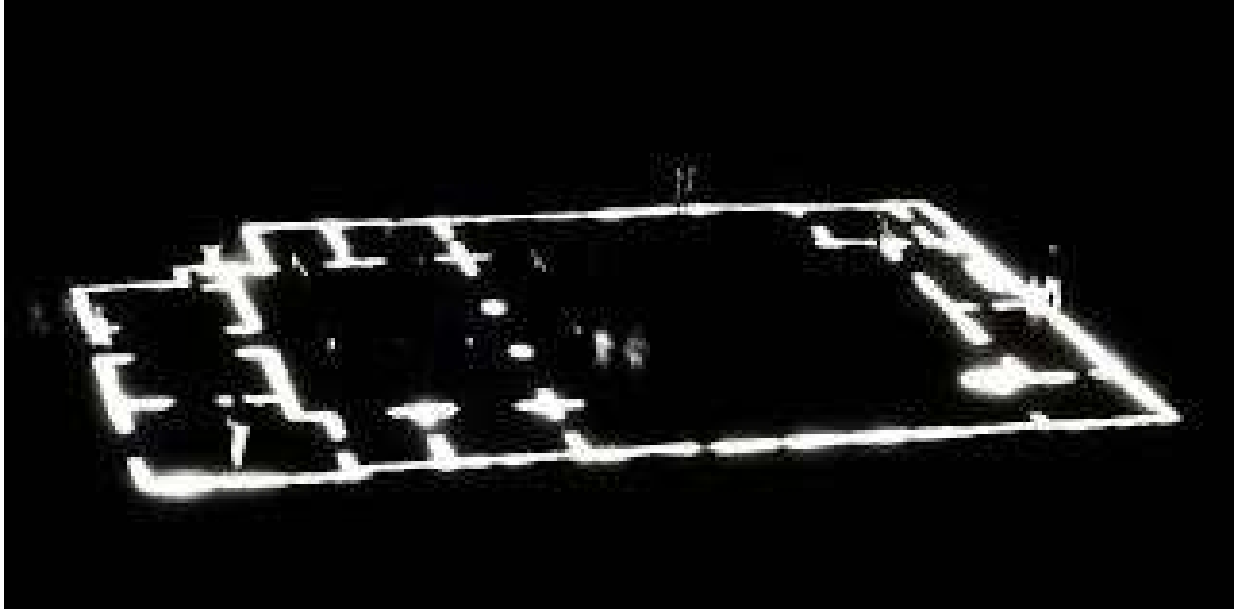
# SOLID LIGHT WORKS

Anthony McCall



Solid light works, make elegant use of a cavernous space that can easily overwhelm the objects it holds. The light creates a cone, a volumetric shape made up by a projecting beam of light evolved into a real three-dimensional space.

Solid light works installation represents the possibility of light to create an actual space in which the visitors can be involved, they can stay and create a use in it, even if is just by sitting within the light.



“Floor plan” 1991. Melissa Gould

“Light is a form of energy that exposes things to our eyes and shapes everything around us. In art, it is the artifice that allows the three-dimensionality and the qualities of the pictorial work. His studio has been of interest to artists of all times, who have tried to imitate it, capturing it on his canvases and even, during the last century, it was used as a work in itself –as proposed by a group of artists called neon artists. The use of light expands to other disciplines such as architecture, where it is understood as lighting of spaces, light and darkness, certain fundamental elements of the architectural experience.”

The previous examples presented as part of this research are meant as a compilation of different ways in which lighting has and is used in spaces, and furthermore they intend to illustrate the different ways in which lighting with all its components is able to transform a space.

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<https://www.grupoeducar.cl/revista/edicion-223/la-construccion-arquitectonica-por-medio-de-la-luz-canaletto-massimo-uberti/>

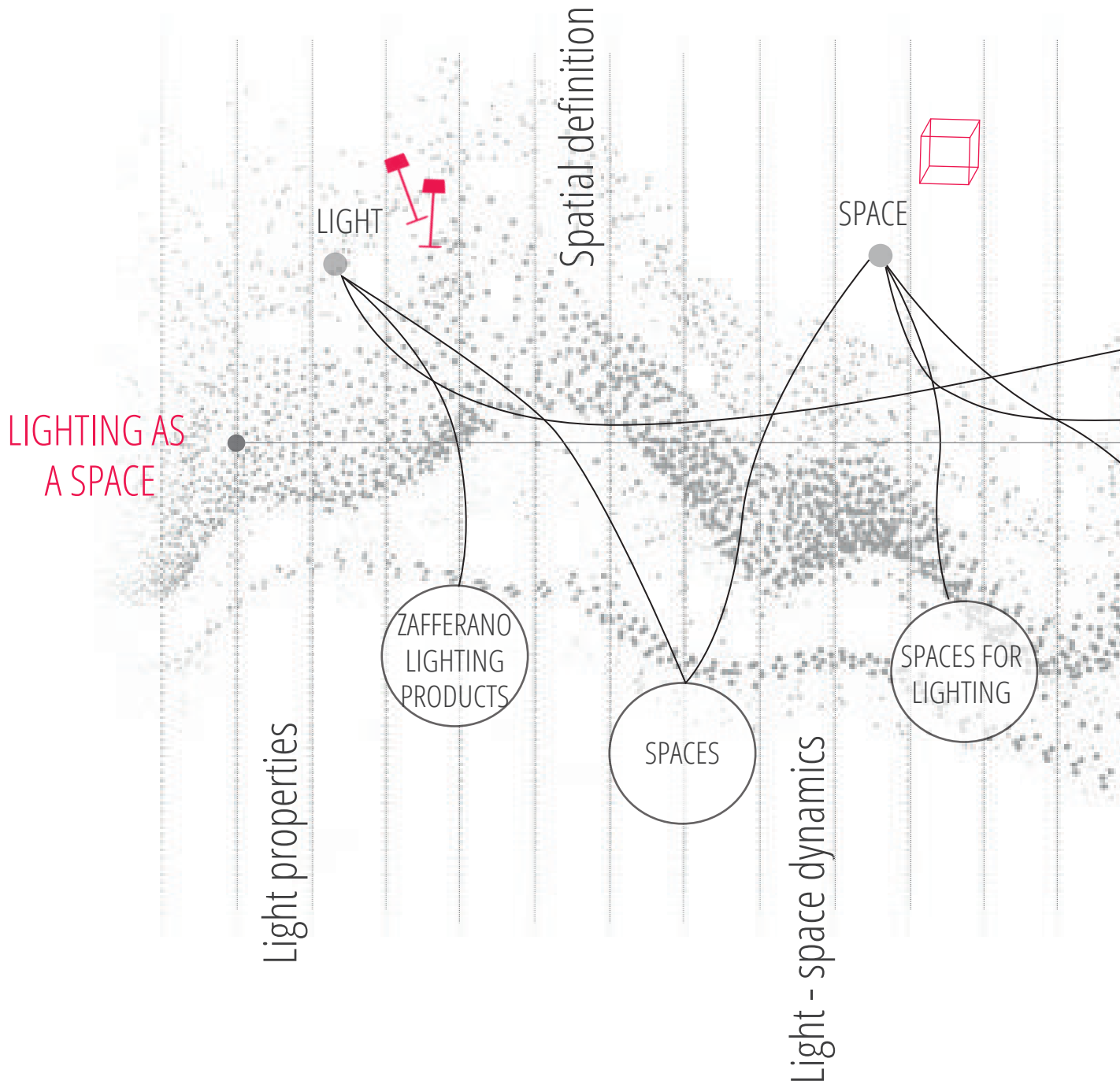
**“ARCHITECTURE IN  
NOT FOUR WALLS  
AND A ROOF ;IT IS  
ALSO, AND ABOVE  
ALL, THE AIR THAT  
REMAINS WITHIN,  
THE SPACE THAT  
THESE ENCLOSE.”**

Lao-Tse.

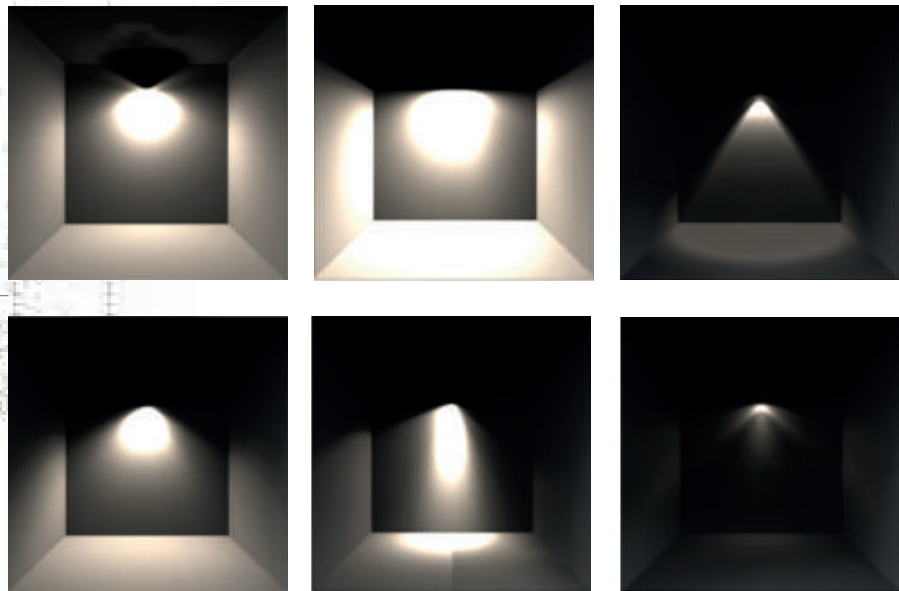


09

**REFLECTION**



Light effects



As lighting is able to affect completely a space becoming a tool for its transformation and a tool able to shape spaces. Therefore it can be inferred that lighting could also become space itself.

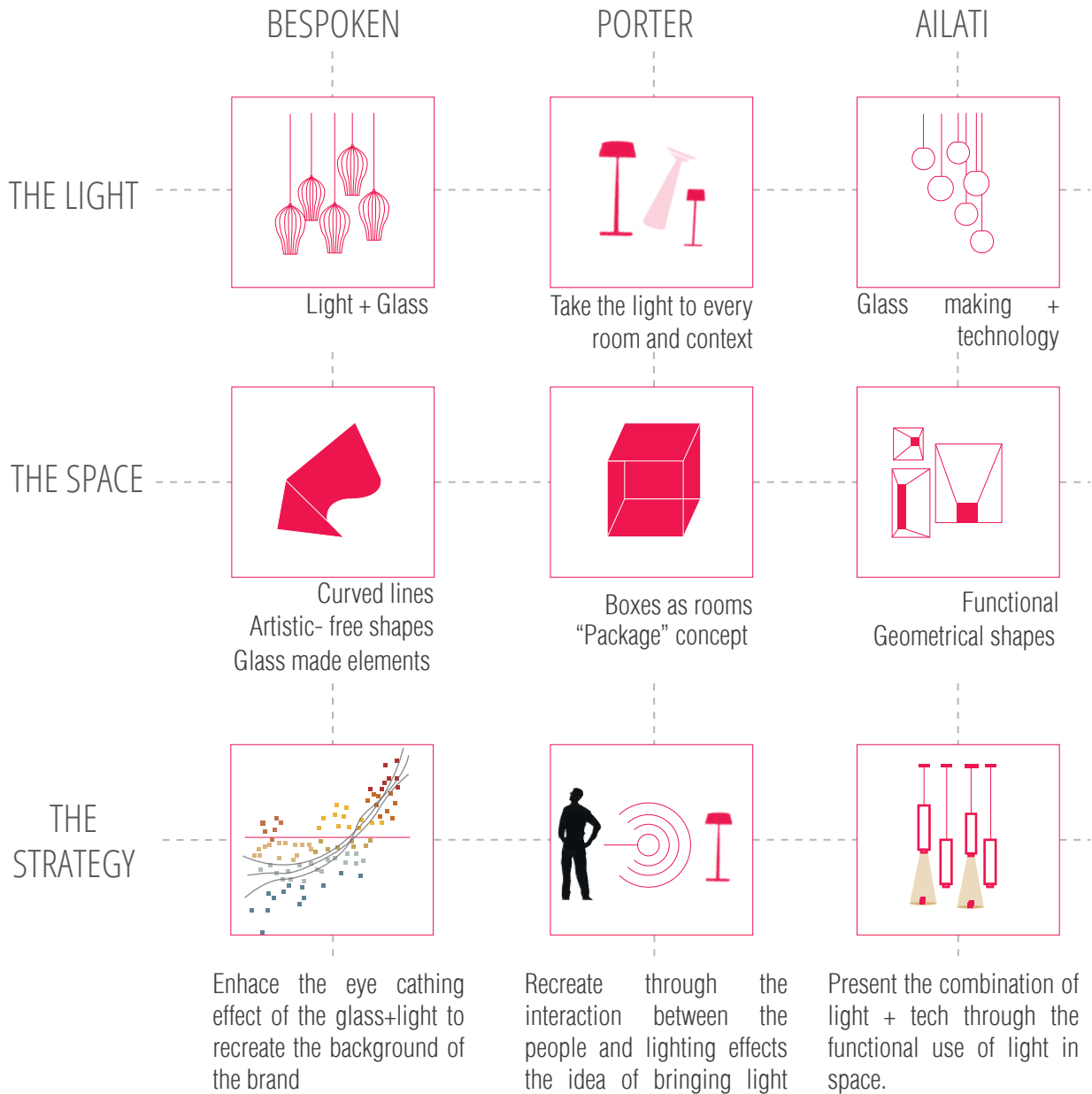
LIGHTING  
'CONTAINERS'

Thesis Incubator Studio

# 10

**PROJECT**  
PRECONFIGURATION





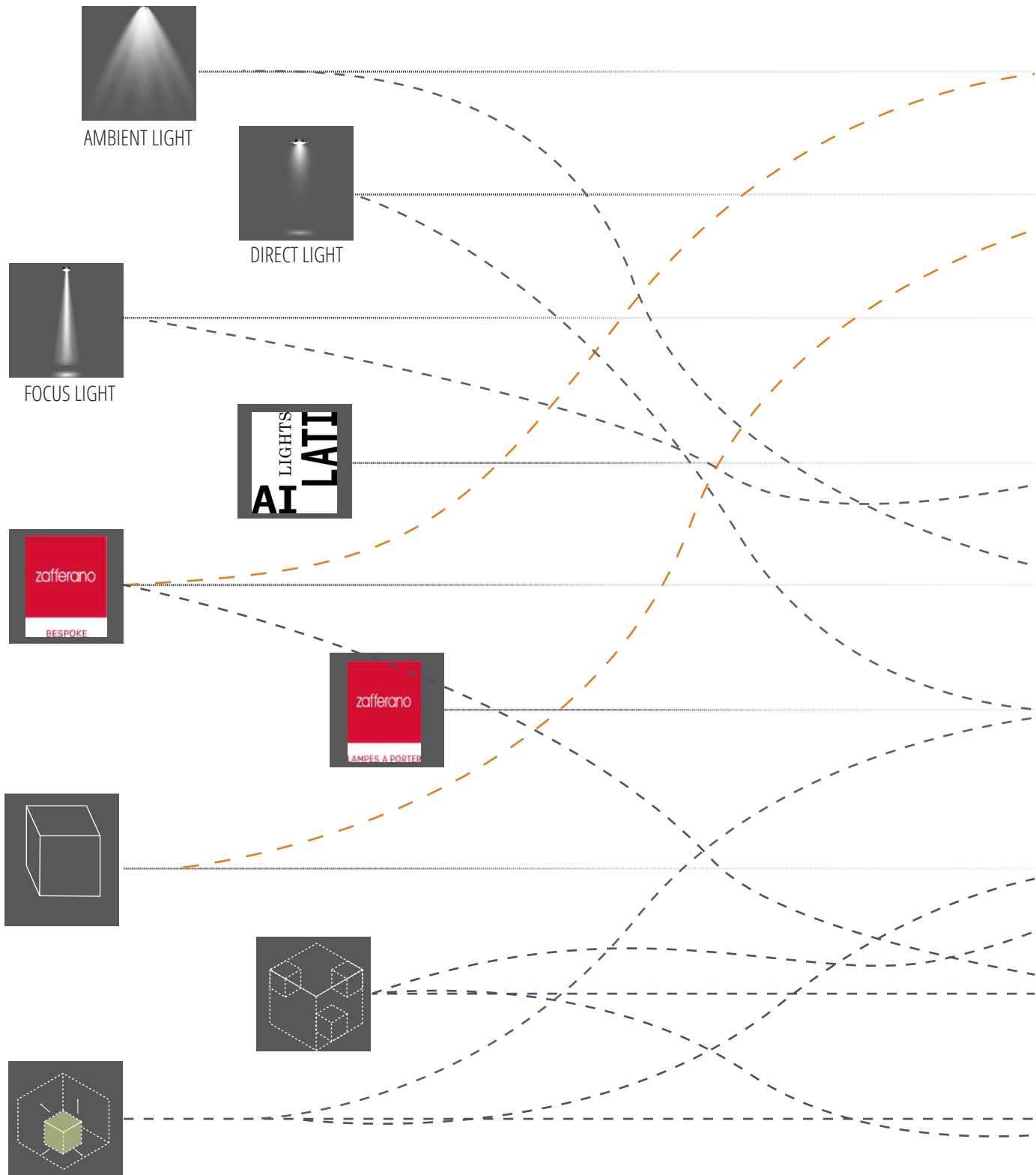


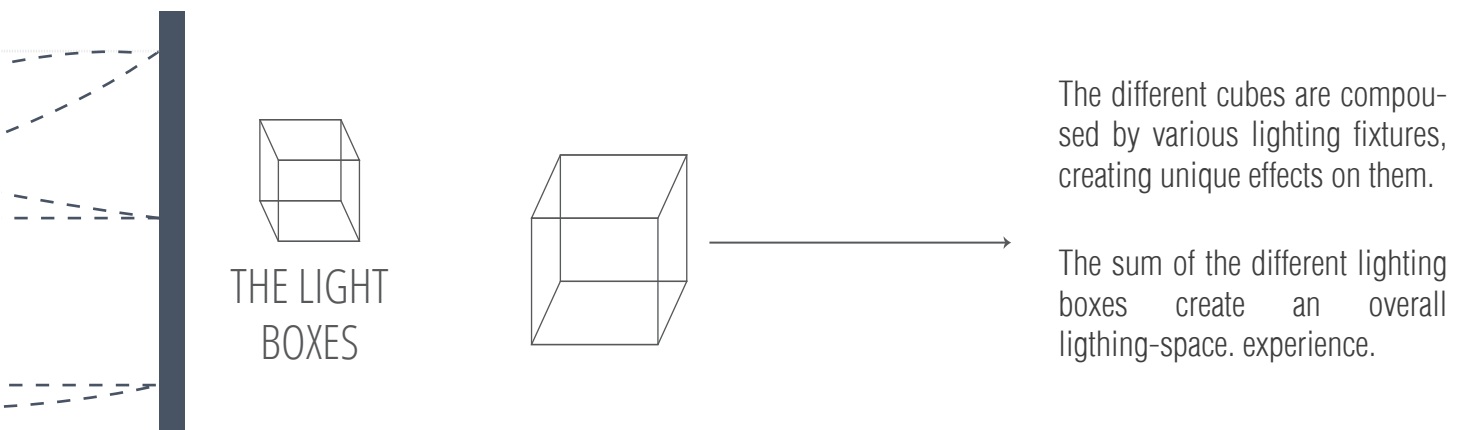
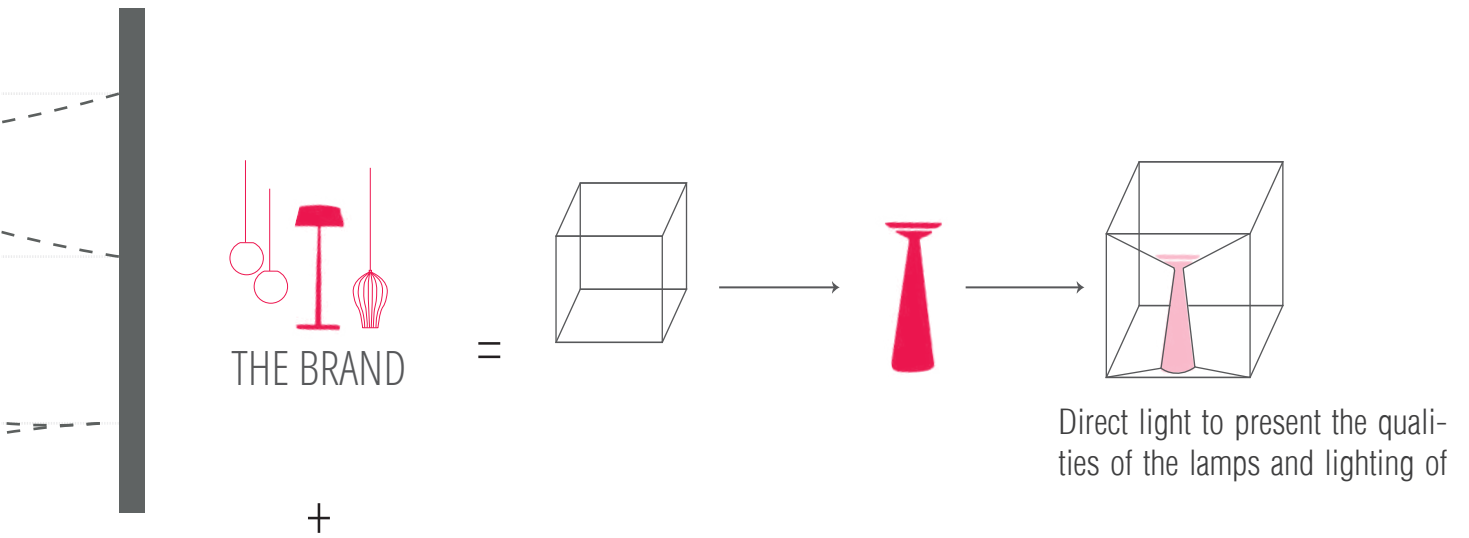
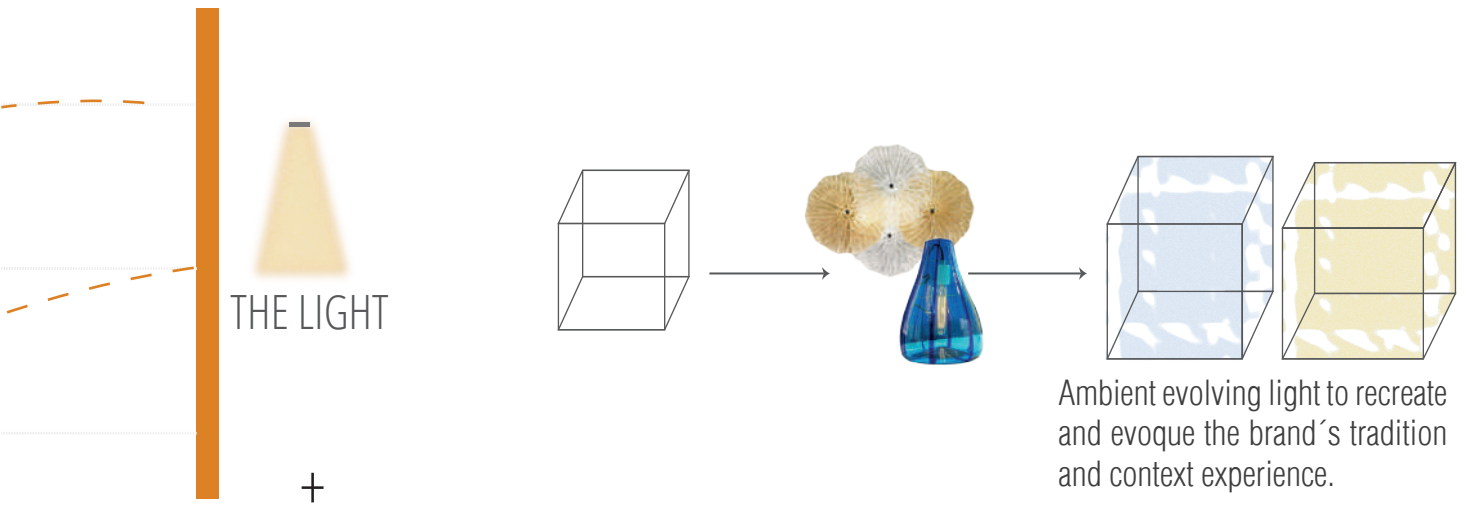
1

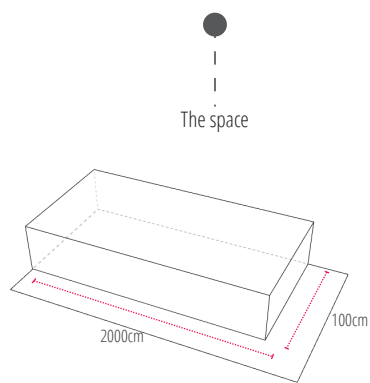
1

**PROJECT**

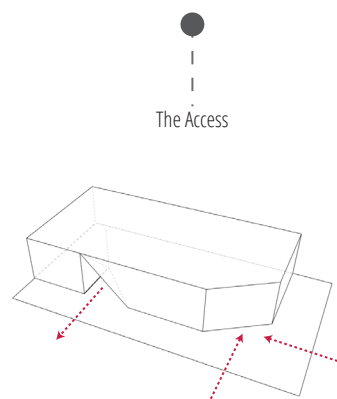
**IMPLEMENTATION**



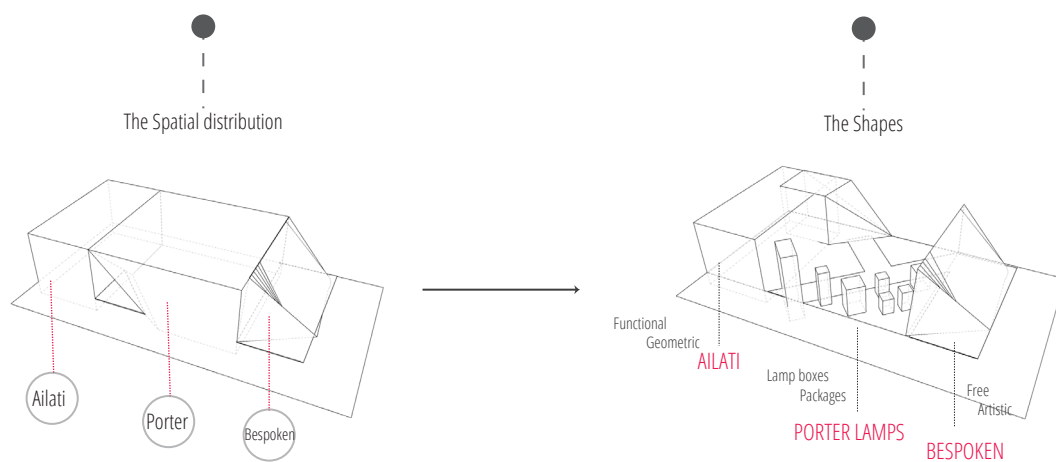




The space is defined by the exhibition stands in which Zafferano exhibits its lighting products.

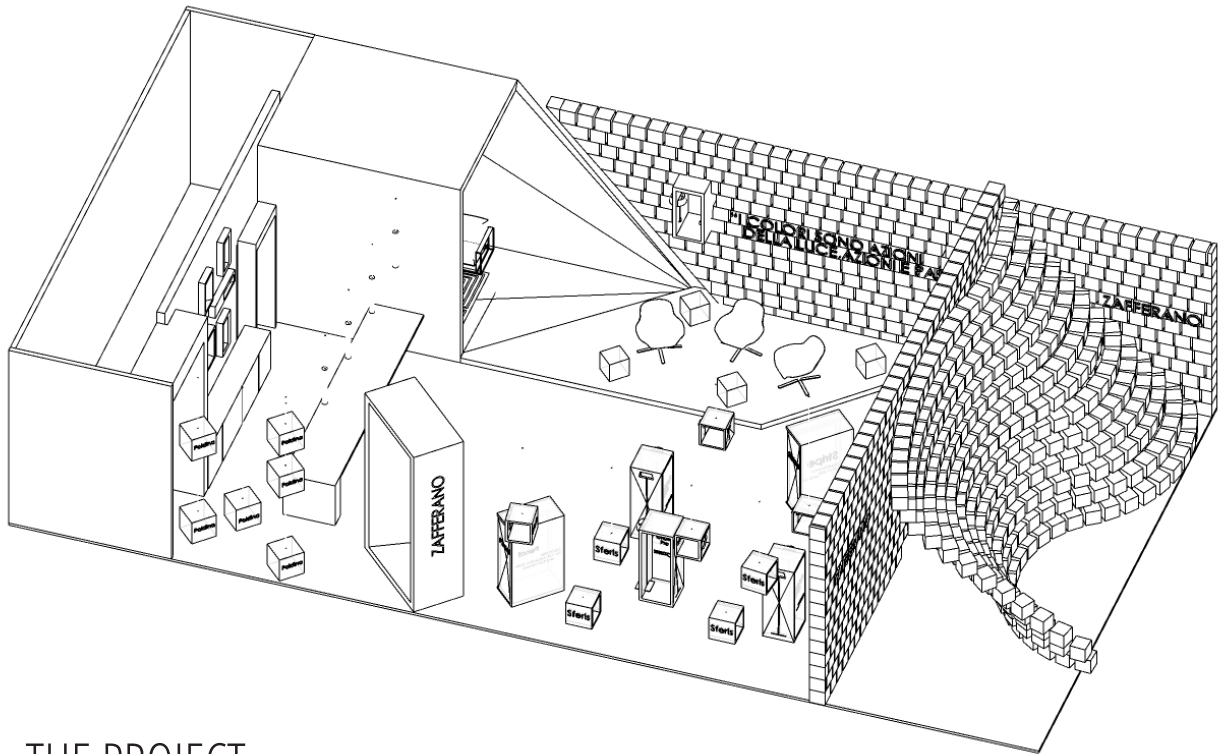


Taking into consideration the stand characteristics, the entrance and exit are defined to take advantage of the open facades of the stand.



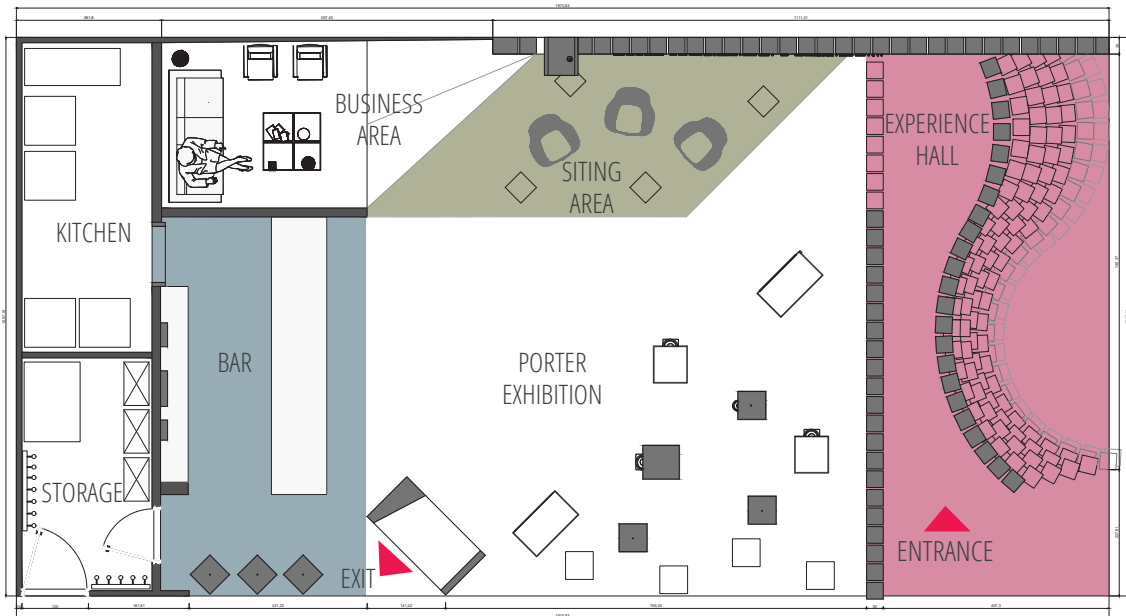
As the stand design answers to the lighting fixtures that are within it. The space is divided according to the brands of lighting that Zafferano has. Each space will recall the main aspects of the lamps that are being exhibited.

The stand shapes answer to the lamps that are holding, as well to the character of each of them. In addition the spaces try to create a connection with the brand, for which sutil elements and shapes of its background are placed in the space.

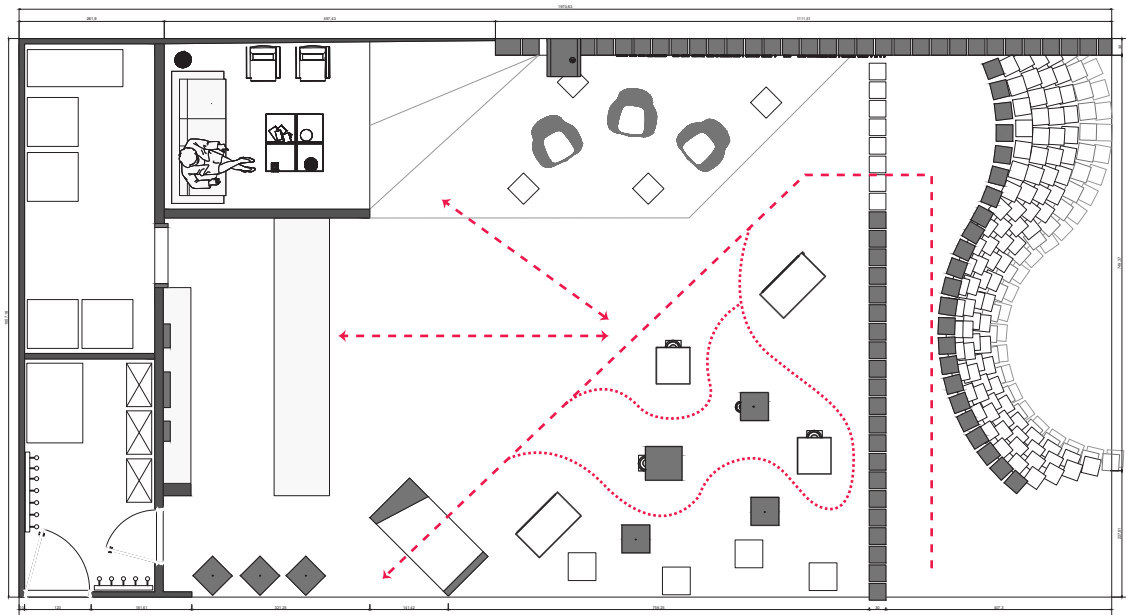


## THE PROJECT



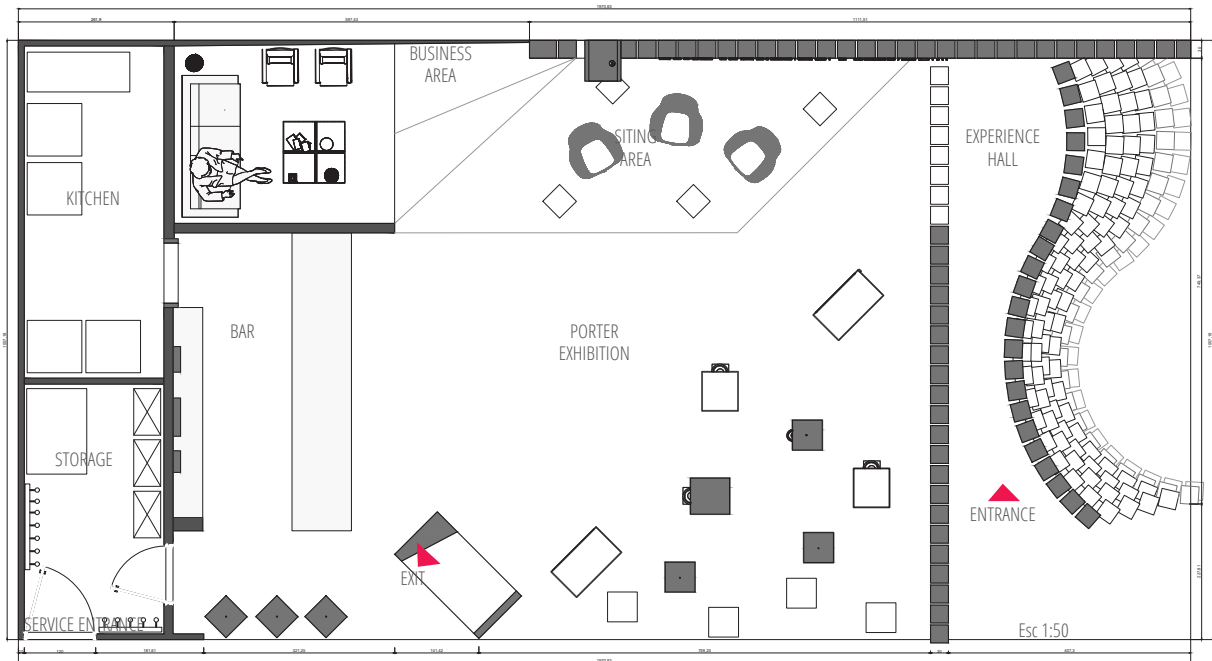


SERVICE ENTRANCE



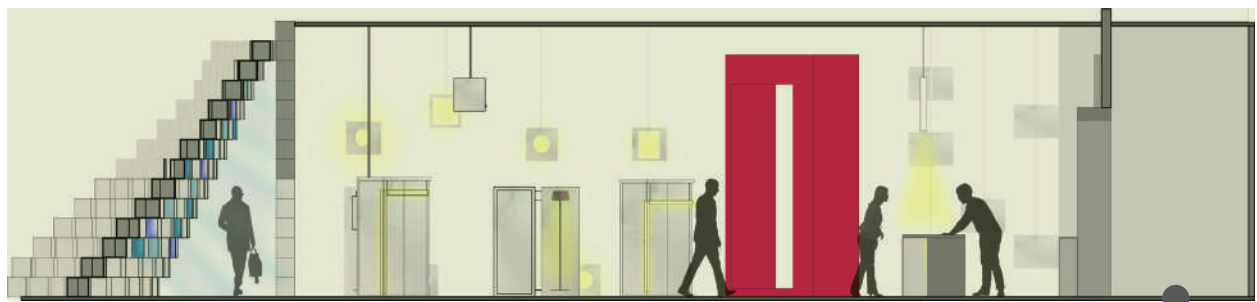
- FAST PATH
- ..... EXHIBITION PATH

# Thesis Incubator Studio



## PROJECT GENERAL PLAN

SECTION A-A'



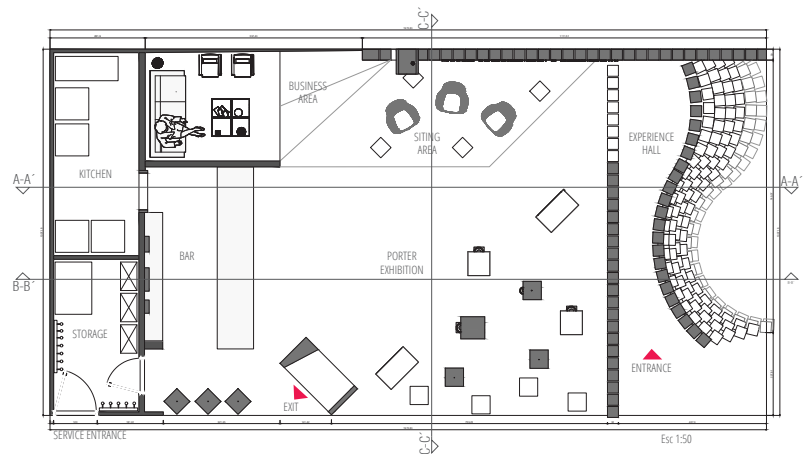
● ACCESS  
LIGHT-GLASS EXPERIENCE

● PORTER EXHIBITION  
TAKE THE LIGHT WITH YOU

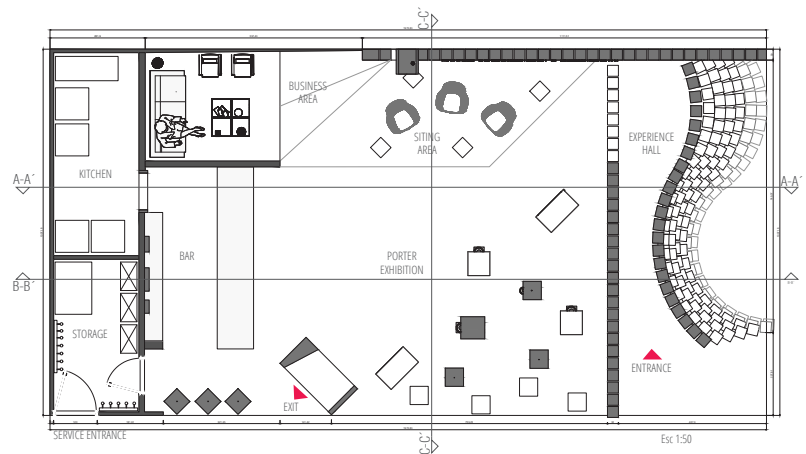
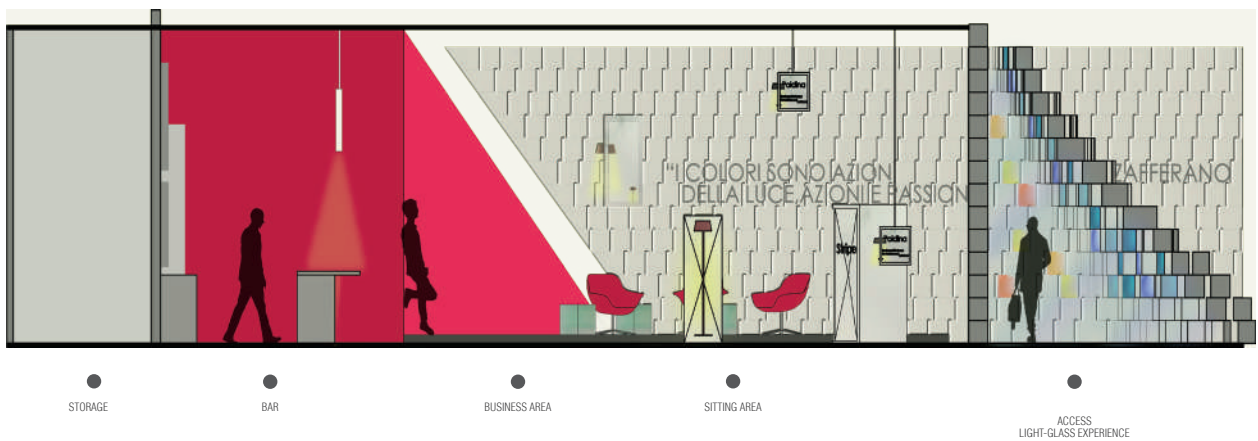
● EXIT

● BAR

● KITCHEN



SECTION B-B'

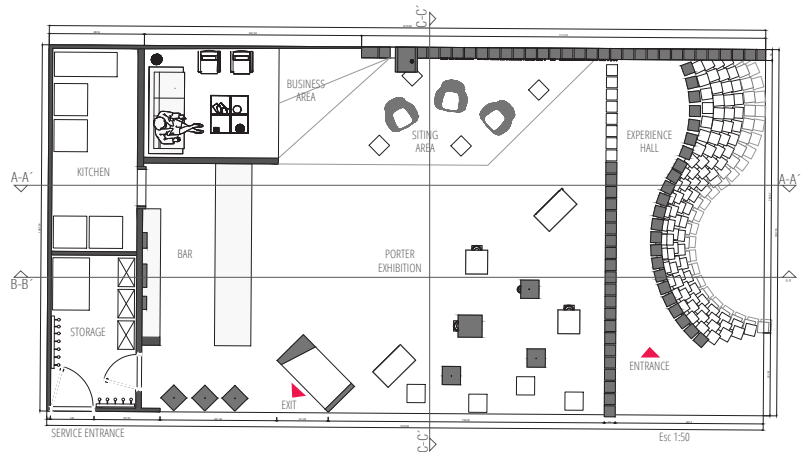


SECTION C-C'



●  
ACCESS  
LIGHT-GLASS EXPERIENCE

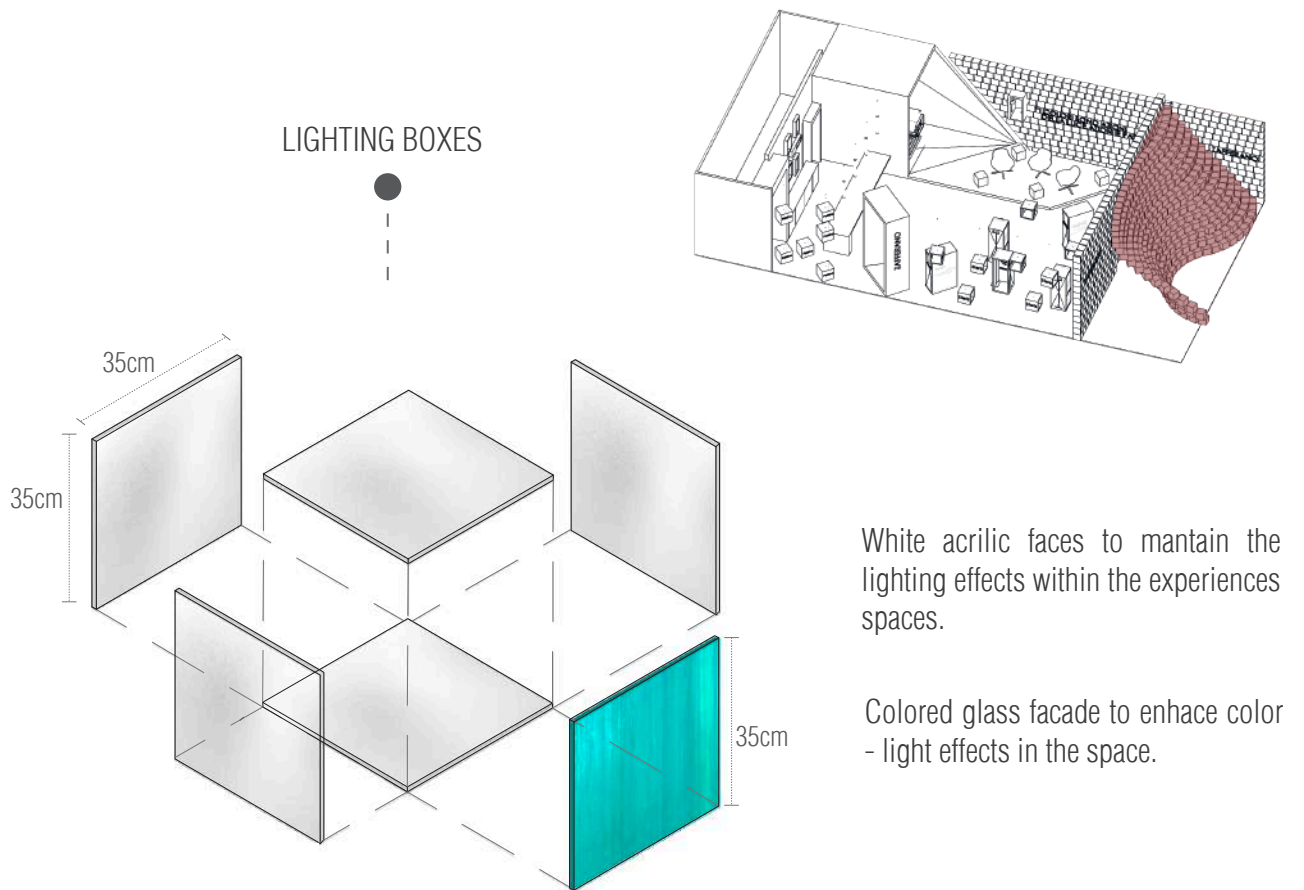
●  
PORTER  
TAKE THE LIGHT WITH YOU



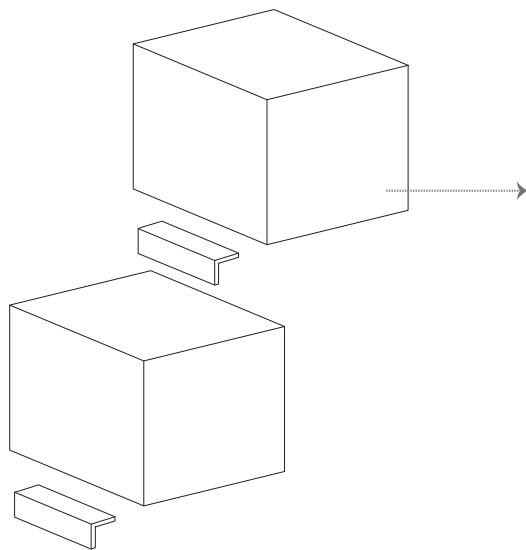


# 12

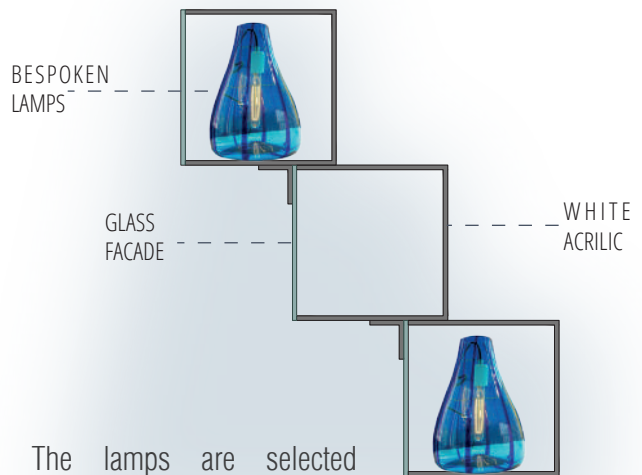
**PROJECT**  
DETAILS



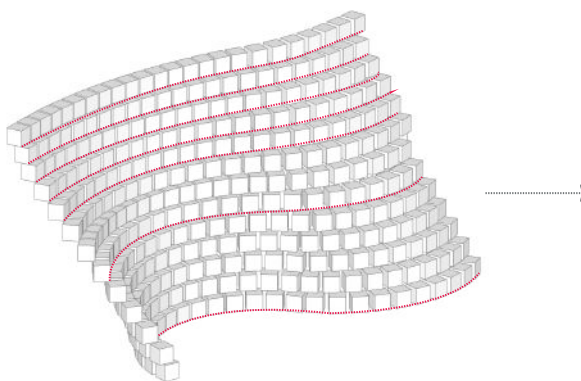




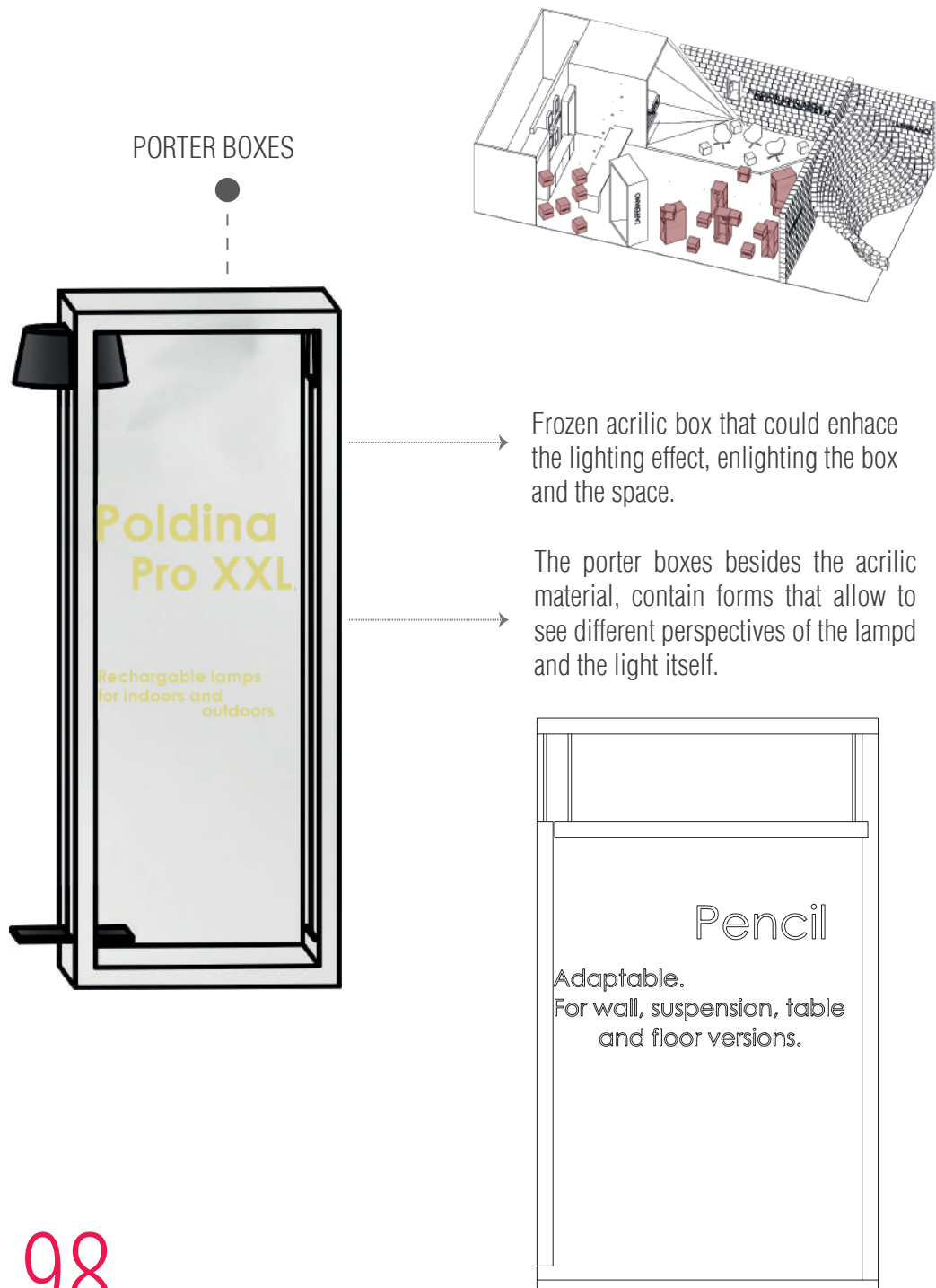
The boxes are built as a single element and all of them are attached through metallic elements in L shape.

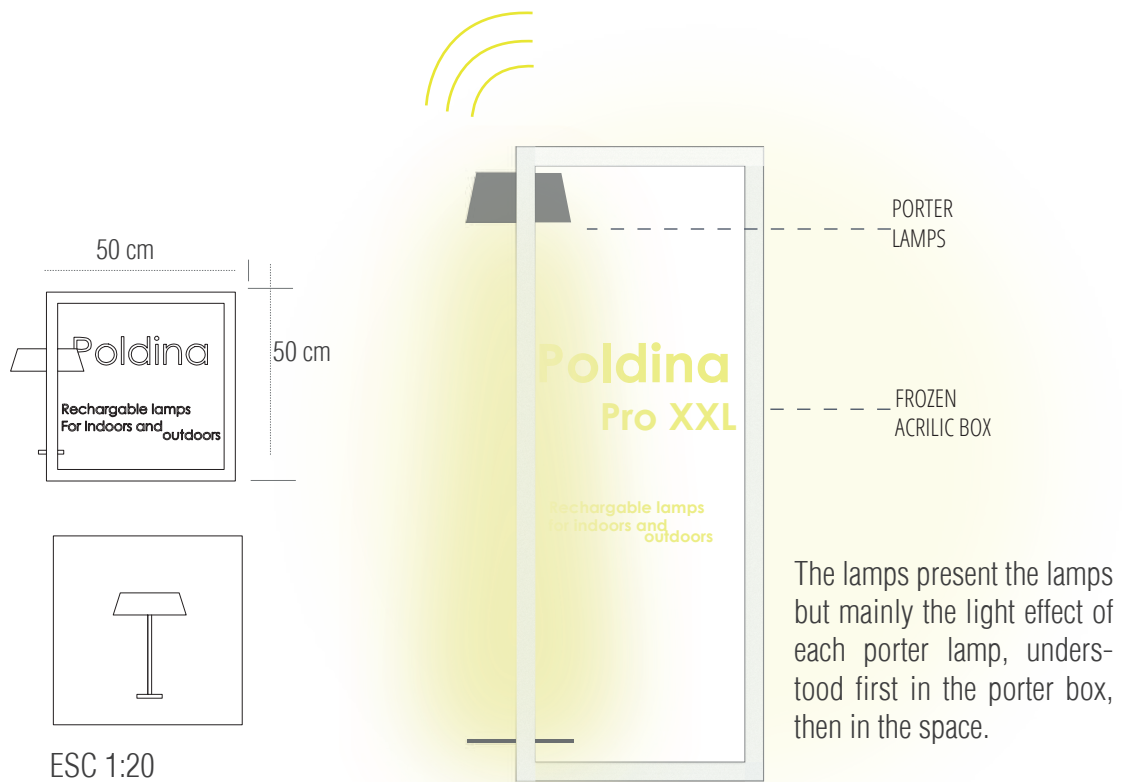


The lamps are selected according their color to enhance a color atmosphere. This in order to highline the experiences.

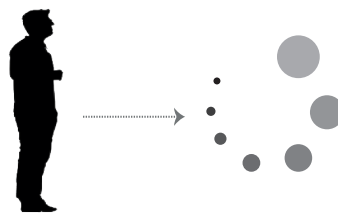


With the purpose to create a movement to evoke the organic shapes related with the experience and the lighting, the boxes are display following curved lines in each level.





The porter boxes are made specifically for each lamp, its size is adapted according to the lamp and it presents the main information of the lamp characteristics.



The boxes contain a movement sensor that in a progressive way turns on according to the proximity of the people towards the box.

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100

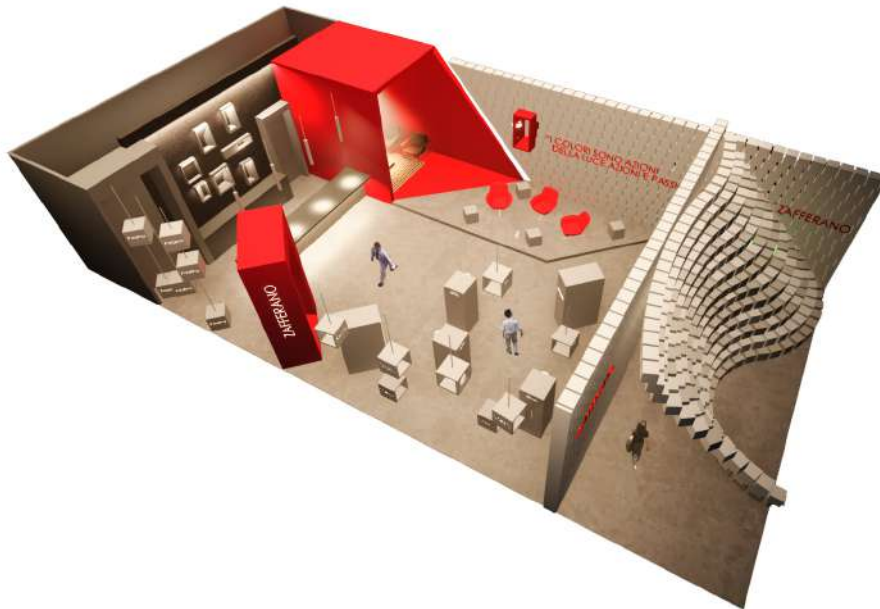
# 13

**PROJECT**  
RENDERS

# Thesis Incubator Studio

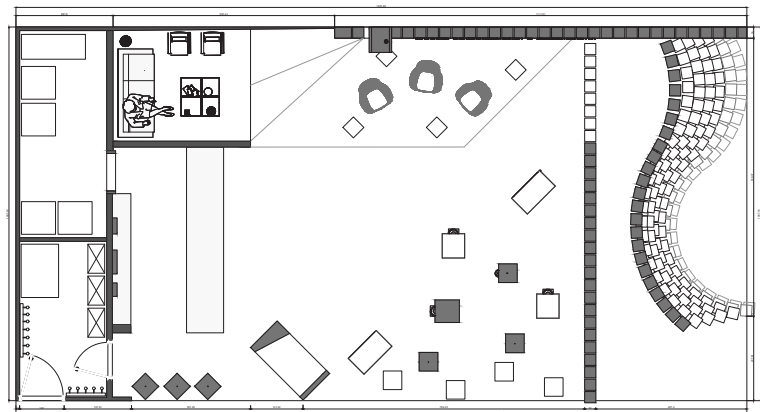


01



02

VIEWS LOCATION



102

01

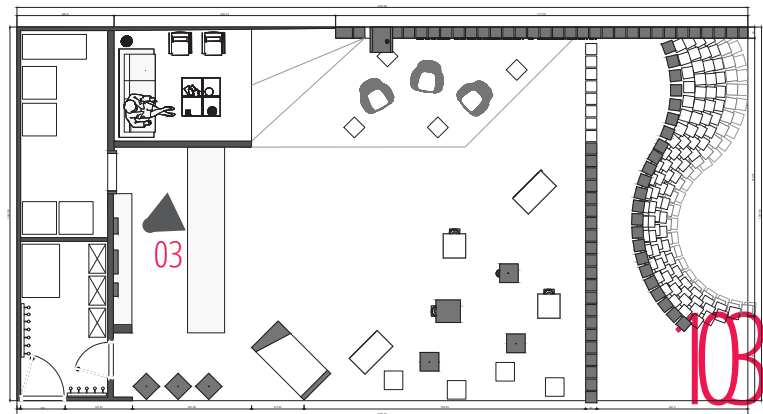


03



04

IEWS LOCATION



04

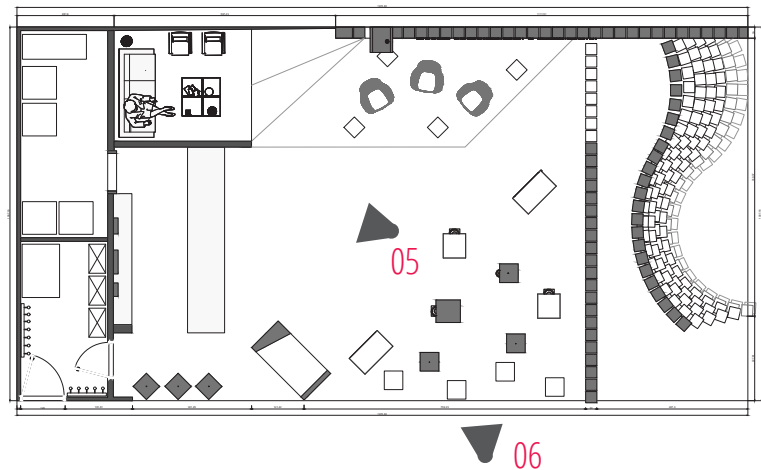


05



06

VIEWS LOCATION





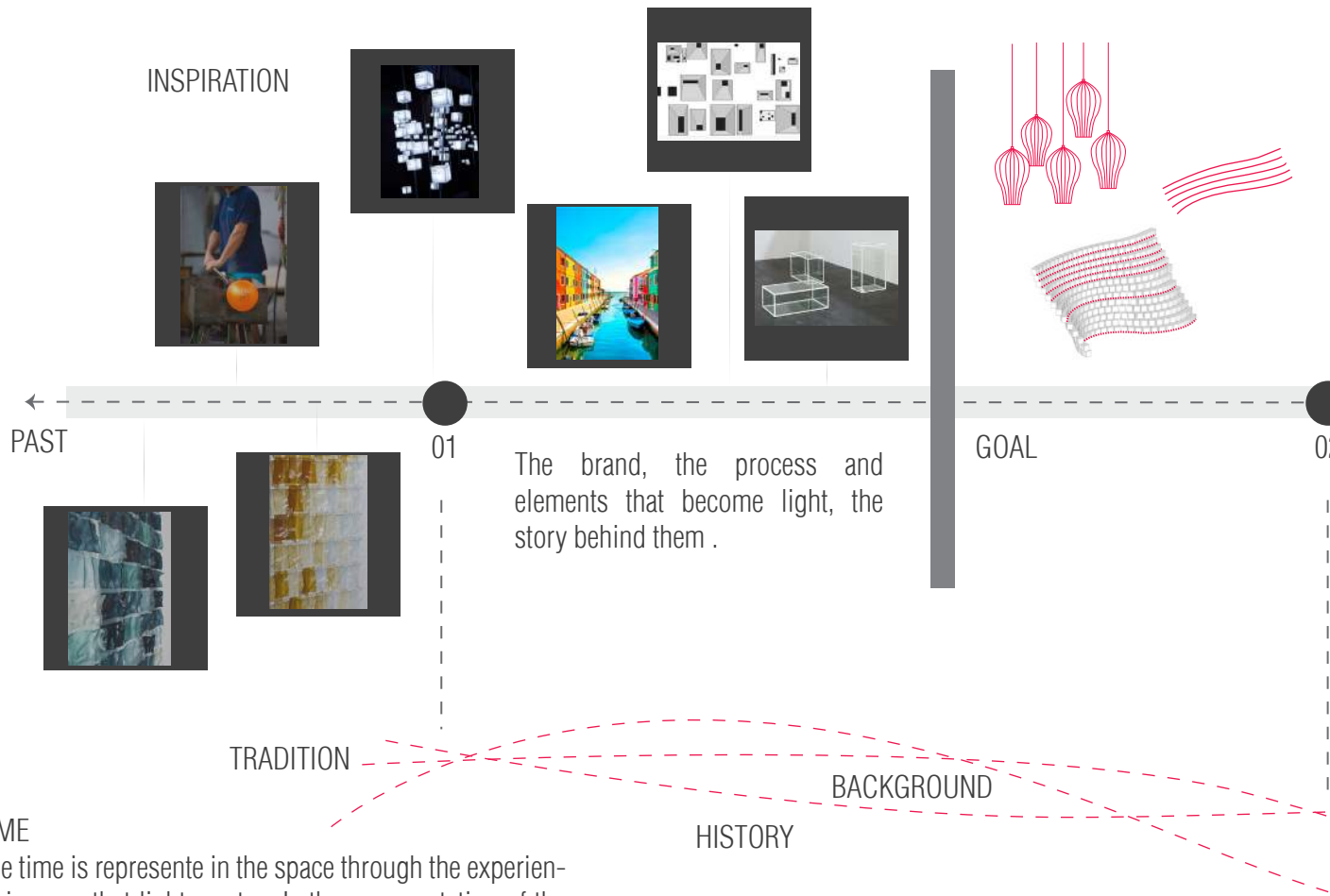




# 14

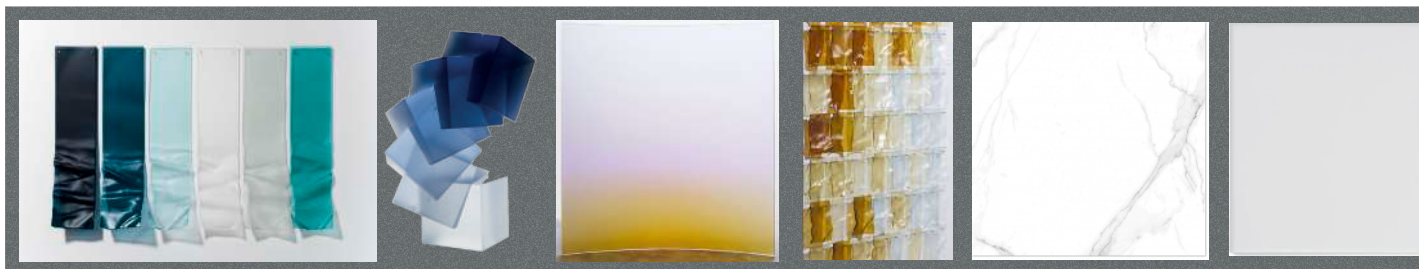
**PROJECT**  
SENSE AND TIME

# Thesis Incubator Studio



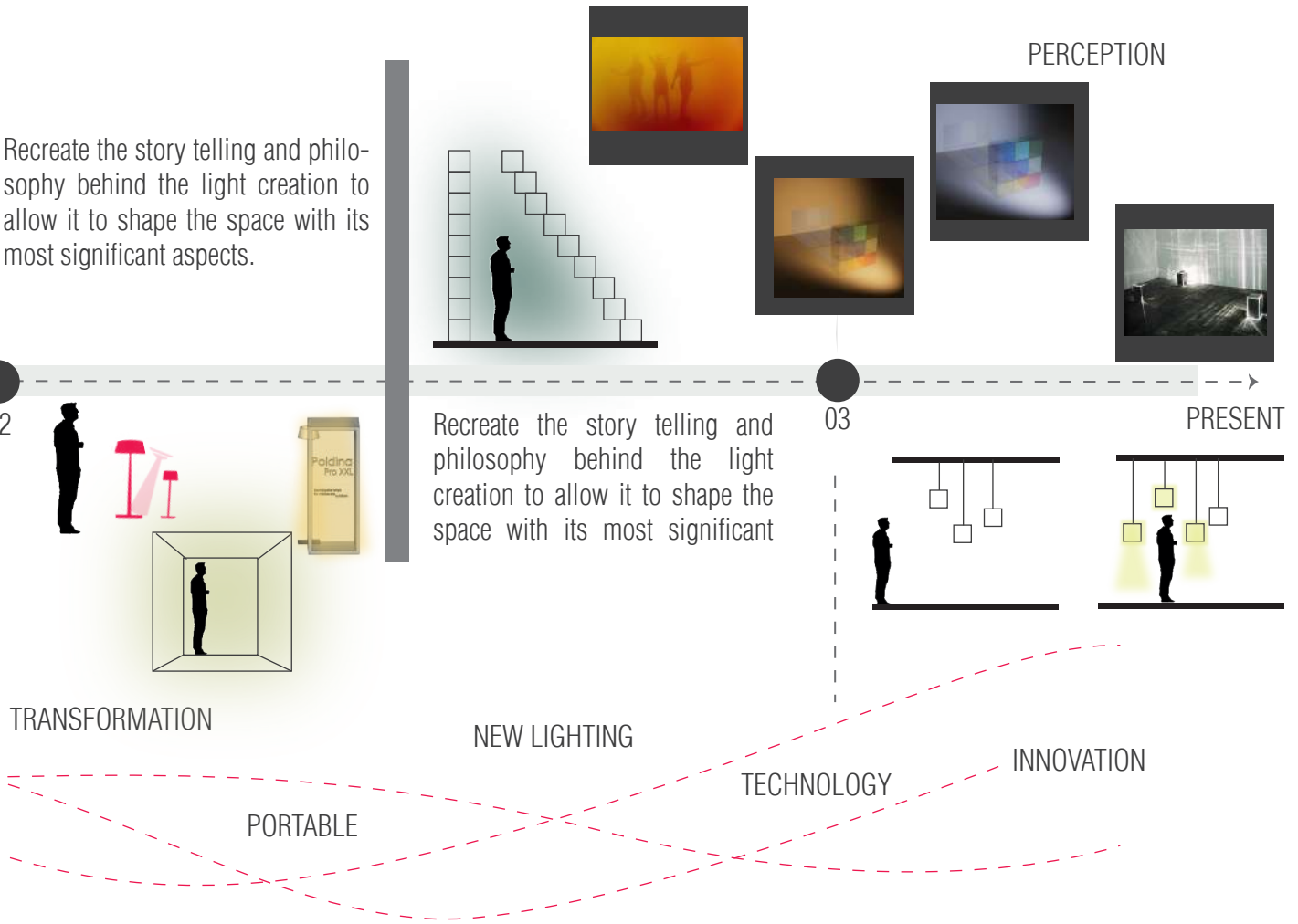
**TIME**  
 The time is represente in the space through the experie-  
 nce journey that light creates. Is the representation of the  
 lighting transformation, from the tradition, the history  
 towards the innovation and modernity. The brands and the  
 lighting timming that the visitors are able to evidentiare  
 throught the lighting spaces-

## TRANSLUCENT MATERIAL



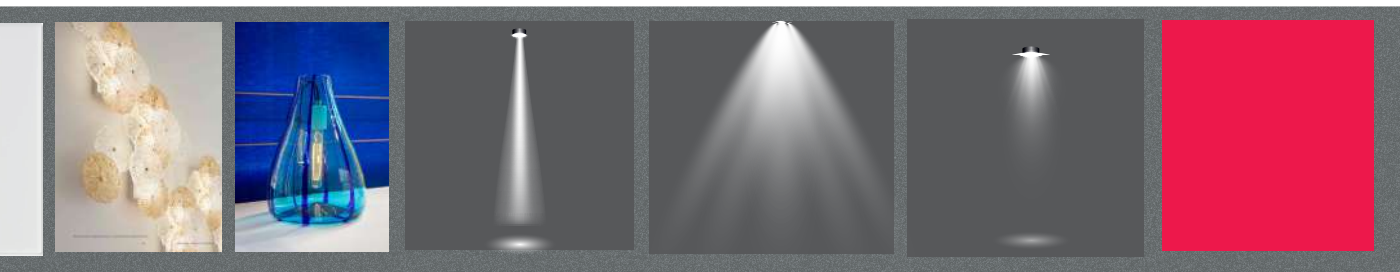
## COLOR TONES

Recreate the story telling and philosophy behind the light creation to allow it to shape the space with its most significant aspects.



BRAND LAMPS

BRAND COLORS

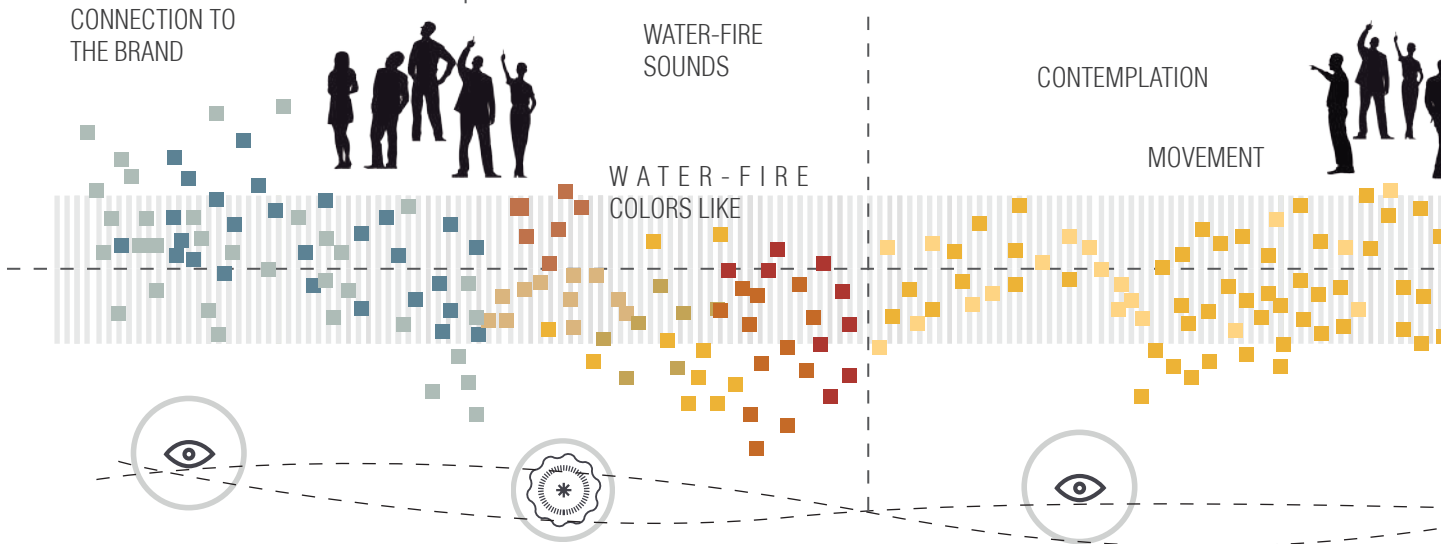
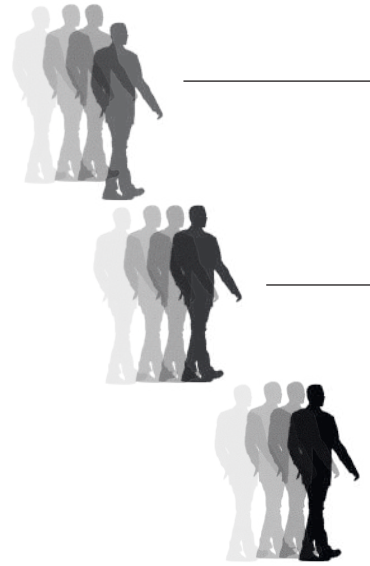
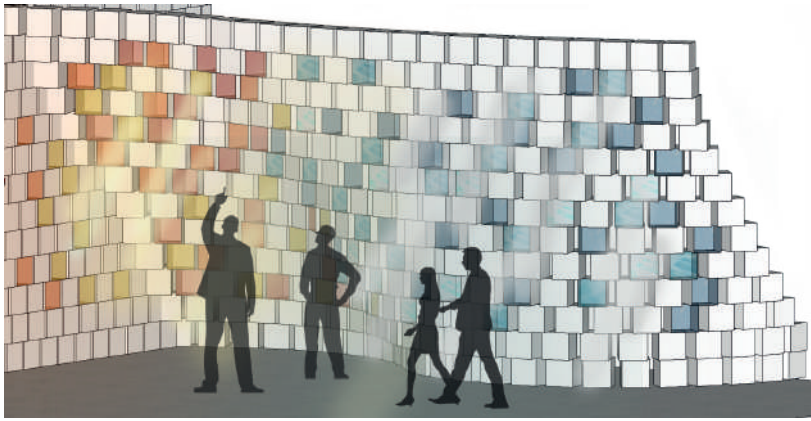


LIGHTING EFFECT



# 15

**PROJECT**  
EXPERIENCE



1. **BESPOKEN**  
Light and glass experience

The blue light and glass elements produce an atmosphere that creates memory towards the brand's context; Murano, the lagoon.

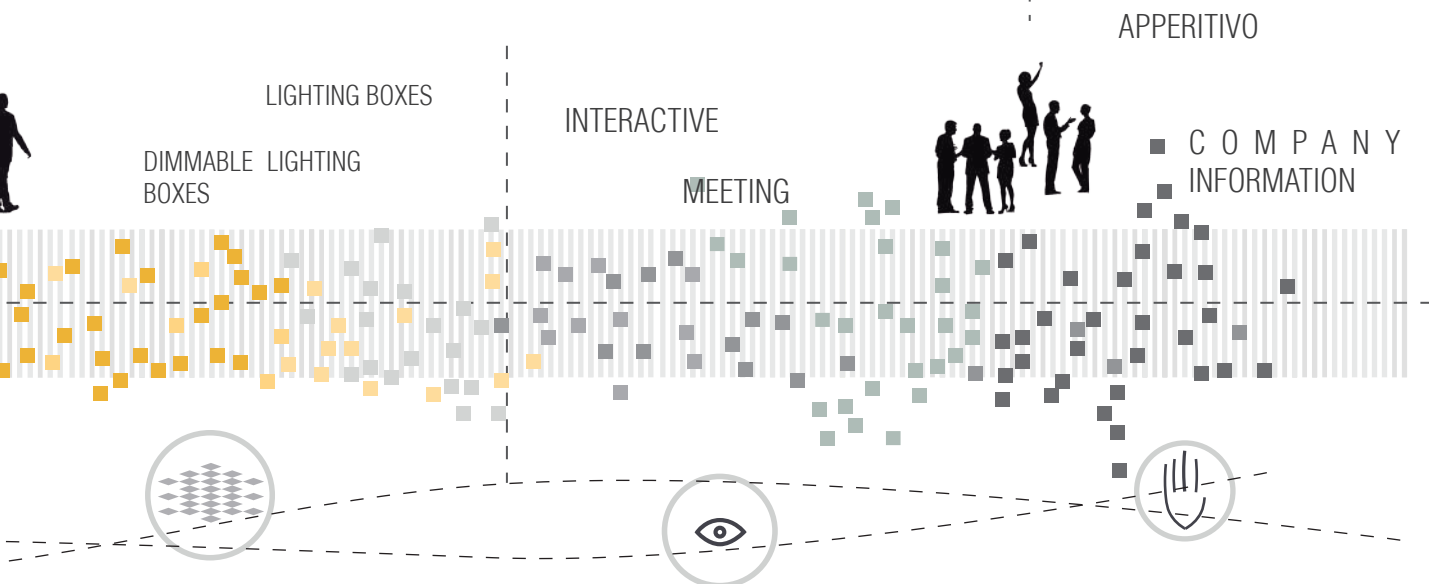
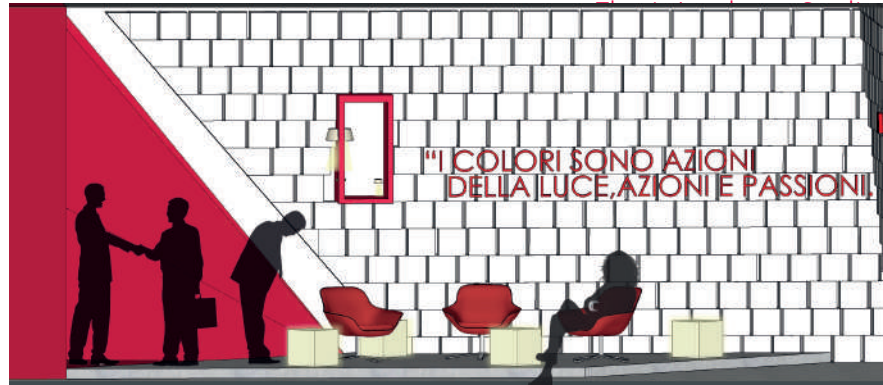
2.

The blue atmosphere transforms into a yellow-red atmosphere to recreate the furnace color, and the glassblowing process for the bespoke lamps and the brand's handmade tradition.

3. **PORTER**  
Take the

"Take the light with you" the space lighted by their proximity. The movement sensors create a lighting effects in each of the boxes, that present the lighting effects in each of the boxes.



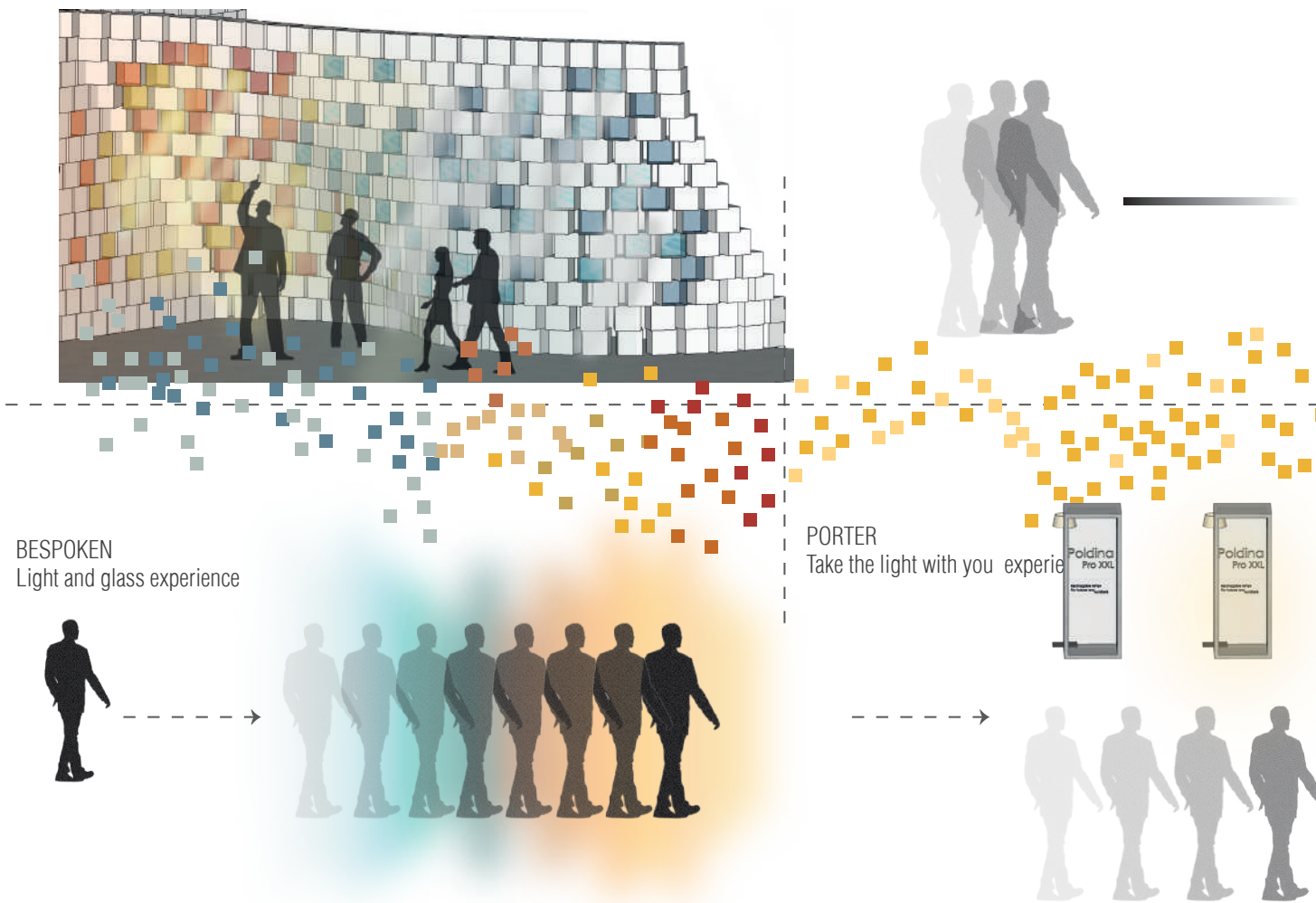


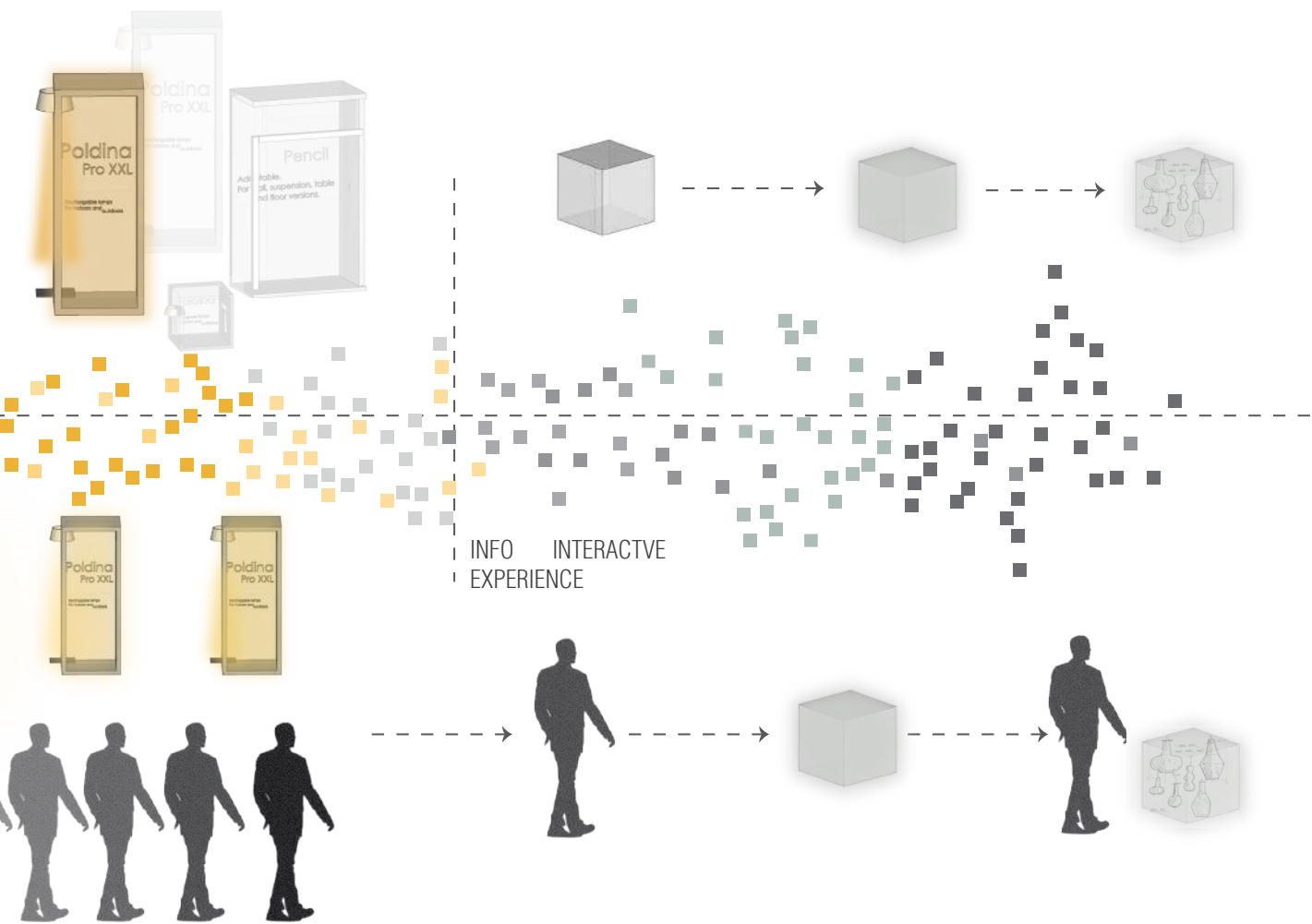
R  
e light with you experience

users arrive to a  
ty to the boxes.  
and dimmable effect  
lamps and the  
boxes.

4. | INFO EXPERIENCE

The journey through the stand ends with the business and meeting area, where aperitivo is offered in the bar area, as well the sitting area where people can find information about the brand in some interactive boxes that turn on by touch.





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Ho Ting Iris so  
Toronto, 2016

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Peter R. Boyce  
NY. 2010

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Peter R. Boyce  
NY. 2003

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[https://ec.europa.eu/health/scientific\\_committees/opinions\\_layman/en/energy-saving-lamps/l-3/1-light-electromagnetic-spectrum.htmrep=rep1&type=pdf](https://ec.europa.eu/health/scientific_committees/opinions_layman/en/energy-saving-lamps/l-3/1-light-electromagnetic-spectrum.htmrep=rep1&type=pdf)

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Politecnico di Milano School of Design  
Laurea Magistrale in Interior and Spatial Design  
Thesis Incubator Studio 2019 - 2020