Design as a combination of innovation and added value, and the role of the interior designer

What are the limiting factors for the development of eco-design in interior design?

Mémoire présenté par
Imane SAKSOU

Pour l'obtention du diplôme de
Master en Sciences Commerciales

Année académique 2017 - 2018

Promotrice :
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Boulevard Brand Whitlock 2 - 1150 Bruxelles

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INTRODUCTION

In this introduction, I will first explain what leads us to that specific thesis. Also, I will explain its structure and its main goal. Besides, I will explain the type of thesis that has been chosen as well as the type of sources that will be used throughout its development.

For as long as I can remember, I have always had an interest in creativity. Hence, it seemed interesting to me to use this thesis to prove that there are connections that can be made with business studies. Moreover, I read some articles that were showing a growing interest in creative industries. For instance, as explained in a press article, the European Union has created a program called Creative Europe which consists in supporting these industries with a budget of 1.5 billion euros (ActuaLitté, 2017). Also, DesignWeek (2017) develops that these industries could create more than 1 million jobs by 2030 (DesignWeek, 2017). As a result, as more investments are made in the creative industries which are booming, I decided to dig deeper on that subject.

As background, I will explain in a few words what the creative industries are. Titan, Voineagu and Todose (2008) have decided to stress the difference between the creative sectors, the arts fields and the cultural sectors. Indeed, even if they all require creativity as it mixes "artistic creativity", "economic innovation" and "technological innovation", their respective fields tend to differ. On one side, there are the creative sectors which are related to design (such as fashion, interior design and graphic design), architecture and advertising. On the opposite side, there are the arts fields (such as visual arts, performing arts, and heritage) and the cultural industries (film, radio, music, books…). (Titan, E., Voineagu, V., Todose, M., 2008)

After reading several articles, my interest has been directed towards the interior design market for several reasons. It seemed as if it was a field that was relatively misunderstood by the population as well as was lacking clarity by the authorities. Besides, there was a relatively small amount of thesis that had previously been done related to that market. According to me, taking all these aspects into account, it was very interesting to analyse this sector related to the business theory. This thesis has as goals to give an insight in what is currently a part of this segment as well as provide solutions to what could be improved or solved.

In addition to that, I had the ambition to link this thesis to the subject of sustainable development. As it seemed to be very important for me to take that aspect into consideration, I checked if it was feasible to link it with interior design. As a result, that aspect has, in fact, only strengthens the choice for further researches on interior design

because this sector is related to many factors which have direct impacts with the environment. Indeed, because it tackles subjects such as materials, water, energy and health, interior design can definitely be linked to sustainable development and even help to make it more introduced in the life of the population.

Let's move to the structure of this work, from which my main goals will arise from.

Firstly, this thesis will develop the link that can be made between innovation and design. I will start by making an introduction through the different definitions that can be allocated to the terms "design" and "innovation" in order to explain the parallel that can be made between these two words. Indeed, both concepts include dimensions (the technical, scientific, organizational as well as economical dimensions of a project) that are common to their definition itself.

However, they differ as to the fact that the designer has to include an additional sphere to his process: the emotional aspect. The designer has to make sure that the clients can establish a relationship with what is handed to them. Hence, we can say that the experience and sensitivity is a major condition to be considered in the process of creation of a project, putting emphasis on the client relationship.

Through this research, I would also like to develop what affects the interior designer as a project manager. Indeed, there are factors to take into account that must influence their way of working as well as the design of their creations, especially as they have to make sure that their work can be appreciated by many people, unlike artists who value unicity, which only adds complexity to the profession. Moreover, I'd like to make this analysis in order to provide future prospects for the profession which will be related to the eco-design movement. In order to do so, I will analyse the specificities of interior designers through a SWOT analysis.

Afterwards, I will move on to the consumers. Indeed, we cannot guarantee or deny the success of something without considering the end users. Consequently, I will begin this section by developing the general aspects that are affecting the decision-making of customers: values and needs. Afterwards, I will make a focus on emotions as it will have been shown that these currently have the most impact on clients' satisfaction. I will finish this section by linking consumers to sustainable development by analysing green consumption, its correlation with customers' behaviours as well as what is acting as barriers for its further development.

To finish up with the theory, I will focus on sustainable development as it is a central subject to the goal of this thesis. I will develop the circular economy, since not only does the circular idea fits the vision of design but it can also be helpful in the case of this research, as well as how it is linked to the environment and design in order to have

an overall vision on the research question that will be announced in the section right after that.

Then, comes the practical part. I will first present the following research question:

"What are the limiting factors for the development of eco-design in interior design?"

In order to be able to understand all the factors related to this paper, the theory that had been enounced in the previous sections will be verified thanks to three different interviews as well as a survey. Among the three interviews, there will be two interior designers in order to have a better knowledge on the subjects and a sociologist who will allow us to link both design and sustainability. As said, there will also be a survey in order to better understand the consumers' interest and concerns on the matter.

Lastly, an attempt to answer the research question will be made. Along with that, some solutions in order to cope with the factors that are slowing down the establishment of eco-design in interior design will be delivered related to the results of the previous researches and the confrontation with the reality.

It must be stressed that this thesis will be composed of both primary and secondary sources. Principally, secondary sources will be used for the theoretical researches as the theory that will have used already existing data which will enable us to better understand the different concepts developed. Afterwards, only primary sources will be used to verify what was explained before. They will be primary because these sources will be directly collected by myself thanks to the actors interviewed or surveyed. In the end, secondary and primary sources will be mixed in order to comment everything that has been gathered throughout the work and bring an overall vision.

After having thought for a long time about it, the decision has been made to follow a deductive approach in order to deliver a memory of applied research. Hence, this thesis will start from the theory that will be confronted to the reality by interviewing interior designers and a sociologist as well as some consumers, hence allowing to go back to the theory through a conclusion. Thus, there won't be any direct link made with a specific enterprise but rather individual reality checks where I will confront the theory developed beforehand. Indeed, the role of the interior designer will be confirmed through the interviews that will have been made. It will allow us to understand more how it is evolving as well as give an insight on how their work is affected by the dimensions explained earlier and how it can relate to sustainable development.

DESIGN AS A COMBINATION OF INNOVATION AND ADDED VALUE, AND THE ROLE OF THE INTERIOR DESIGNER DEFINITIONS

In order to better understand the main concepts and why this thesis is called "Design as a combination of innovation and added value, and the role of the interior designer", I will first explain the concepts of the first part of the title: "design", "innovation" and "added value". After that, I will create my own definition of "design" related to what will have been said before. In the next section, I will tackle the concept of the following part of the title, the "interior design".

DESIGN

The word "design" has suffered from its common use, which led it to a distortion of its understanding by others.

Besides, as Taura and Nagai (2011) have pointed out, the meaning of the term has evolved and we can trace its history. It is said that there are two different eras that have affected the word "design": the industrial and the post-industrial one. As a result, we better understand why it has been expanded from being focused on efficiency to a bigger concern for the spiritual dimension.

In order to be able to go further, it has to be noticed that design could be used as a noun as well as a verb. When referred as a noun, it is assigned to objects or a creation. In the meantime, when it is used as a verb, it is attributed to "a process, or series of activities". (Miller, W. R., 2005) In the case of this thesis, I will solely reflect on the term "design" as a verb, hence the "thought process compromising the creation of an entity". (Miller, W. R., 2005).

Design underlies in three main concepts: "intuition, insight and reason". (Miller, W. R., 2005) Indeed, for a designer to start the process of creation, he has to feel as if he knows something on a deeper level. In addition to that, that feeling will lead him to want to know more because it will suggest him that he's holding a good idea. Therefore, since these two aspects could lack of rationality, it will require to undergo a deeper analysis of the project which will be linked to methods and know-how in order to verify the different assumptions. (Miller, W. R., 2005)

One of these concepts could not be taken without the other ones. Indeed, they are vital to the creative aspect that is inherent to the profession of the designer. The notion of creativity requires the skills but also a great power of imagination which is very dependant to the human that is in charge of the design process. (Kontrimienė, V., Melnikas, B., 2017) In other words, design and creativity are deeply linked to each other since they are

both about finding a solution for a purpose. (Taura, T., Nagai, Y., 2011) Furthermore, when taking a look at the cultural and creative sector, design is a part of "the creative sectors" instead of "the arts field" or "the cultural industries". Certainly, design doesn't aim to create unique conceptions or be a part of the culture of a territory. (Titan, E., Voineagu, V., Todose, M., 2008)

Besides, design involves a sequence of different steps that are not predefined which lead to the final creation. Indeed, solely the idea of the product isn't sufficient since it requires different activities to access the representation wanted. Hence, the term "design" really is the process that leads to create the entity rather than solely the product. Furthermore, although design could be seen as a linear series, it is actually much more complicated due to the different activities that it requires since it has to deal with different types of problems along the way. As well, design can be repetitive related to the thought process which always demands to test the ideas in order to find the solutions to the possible issues that could occur. (Miller, W. R., 2005) In order to succeed in the creation process, design requires to take technology, socioeconomic and political aspects. (Taura, T., Nagai, Y., 2011)

However, in order to meet the reality that it has to face, the designer has to make sure compromises are made along the way between all the different aspects that lead to the final creation. Indeed, the thoughts that we could have in our minds can sometimes not be feasible through the range of activities available. (Miller, W. R., 2005)

All in all, design allows the realization of something tangible. Although change is a part of its process, so, in other words, the image we pictured in our minds may differ from the final entity, it is necessary to end with a creation otherwise it would be incomplete. However, the final product doesn't have to be physical specifically. Therefore, the design can lead to be material (e.g. a piece of furniture), momentary (such as events), theoretical (e.g. a theory in science) or related to make connections (e.g. relationships). (Miller, W. R., 2005)

To sum it all up, design requires two big sections: the mental process which leads to the creation process and helps through the problem-solving steps. Hence, there is a constant analysis going on which is then summarized and evaluated. (Taura, T., Nagai, Y., 2011)

Another definition that joins what has been developed is the following: Design is "the human capacity to form and build our environment, while breaking away from nature, to serve our needs and give sense to our lives". (Heskett, J., 2005) Annie Gentès (2015) links design to Humanities and Social sciences due to the attention that the designer has on the stakes of the different actors as well as their relationships and appreciation of the entity. Therefore, there's a poetic way of working the reality. Through

this definition, the process aspect is overshadowed by the emphasis on the finality with the final creation.

Since design is many times associated to arts, the difference has to be developed. Indeed, while artists will always try to come up with something unique which is where lies its value, design is more about the repetition since it is looking to please a wide range of users. (Kahane, B., 2015)

INNOVATION

Innovation is hard to define as there is no commonly accepted definition to it. (Van de Ven, A., 1986) However, I will try to come up with different definitions which could help us understand this concept better.

For West and Anderson (1996), innovation is what starts the creation of a new entity in order to advantage the communities since they refer it as "the effective application of processes and products new to the organization and designed to benefit it and its stakeholders" (West, M.A., Anderson, N.R., 1996, p. 689). Here, there is a stress put on the newness and its effect on the organizations.

Gloet and Terziovski (2004) focus more on the fact that innovation tackles the "implementation of discoveries and interventions" and also refers to the process it requires to bring a new entity, whether it's physical or not. Therefore, there is also an importance for creating something new, yet the process that leads to it has as much space.

Therefore, innovation can be linked to the "creativity" concept since they both demand new ideas and influence a group. (Plessis, 2007) It is not surprising since the two concepts require a personal implication from the person creating the entity and a final influence on the people linked to what has been created.

It could also be defined as the "conversion of new knowledge into a new product process or service and the putting of this new product, process or service into actual use" (Angwin, D., Johnson, G., Regnér, P., Scholes, K., Whittington, R., 2017, p.317). In other words, innovation starts off with a new idea or understanding which will draw to a process in order to come up with a final entity.

Baregheh, Rowley, and Sambrook (2009), in their attempt for a multidisciplinary definition of innovation, have suggested a definition based on a wide literature review: "Innovation is the multi-stage process whereby organizations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace" (Baregheh, A., Rowley, J.,

Sambrook, S., 2009). Through this definition, they summarized well the fact that it requires several steps to get to the final new entity. However, it brought a new aspect in the end since it shed the light on the fact that the innovation wasn't benefiting solely the final user but also the organizations that are bringing the creation to life.

Lastly, I will use Oslo's guide (« Le manuel d'Oslo ») in order to tackle innovation because it is specialized in the collection and interpretation of data's related to the subject. It defines innovation as "the implementation of a new or substantially improved product (good or service) or process, a new marketing method or a new organizational method in the company's practices, the organization of the place work or external relations" (Organisation De Coopération Et De Développement Économiques, 2005, p.54).

It classifies four categories in innovation: "product innovations", "process innovations", "marketing innovations" and "organizational innovations" (Organisation De Coopération Et De Développement Économiques, 2005, p.56). Before explaining each of them, it might be interesting to make the difference between "new" and "significantly improved": "new" implies a difference with what has been done previously while "significantly improved" relies on previous products which we change some features such as the material for instance. Now, let's move on to these specific categories. (Organisation De Coopération Et De Développement Économiques, 2005, p.56)

Let's start with product innovations. It stands for "the introduction of a good or service that is new or significantly improved in terms of its characteristics or the purpose for which it is intended; (…) it includes significant improvements in technical specifications, components and materials, embedded software, user-friendliness, or other functional features" (Organisation De Coopération Et De Développement Économiques, 2005, p.56). In other words, the stress is put on the core of the good, its characteristics and specificities. It can use new as well as previously used technologies and knowledge. It must be noticed that changes related to the conception of the production which would not lead to changes of the final products are not considered as product innovations. (Organisation De Coopération Et De Développement Économiques, 2005)

Secondly, there are the process innovations which mean the "implementation of a new or substantially improved production or distribution method; (…) it implies significant changes in techniques, equipment and/or software" (Organisation De Coopération Et De Développement Économiques, 2005 p.57). In order to be clearer, production aims what is used to produce the final product while distribution tackles the logistic as well as the resourcing, the supplying and the delivering process. (Organisation De Coopération Et De Développement Économiques, 2005)

The next category is marketing innovation, which is "the implementation of a new marketing method involving significant changes in the design or packaging, placement, promotion or pricing of a product" (Organisation De Coopération Et De Développement

Économiques, 2005, p.58). This innovation can really be focused on the consumer as it aims to meet their needs, but it is also related to the market and sales. They usually imply changes in the conception or conditioning process since it could modify the appearance which can be significantly important for marketing purposes. (Organisation De Coopération Et De Développement Économiques, 2005)

The last type of innovations is organizational innovations. It tackles "the implementation of a new organizational method in the firm's practices, workplace organization or external relations" (Organisation De Coopération Et De Développement Économiques, 2005, p.60). This innovation can be related to the overall performance of a company because it takes costs as well as the human factor into consideration. It relates to the daily working life of the firm as it works on, for instance, the working procedures, the decision-making, the relationships with the external world. As a disclaimer, it has to be said that fusions and acquisitions aren't organizational innovations. (Organisation De Coopération Et De Développement Économiques, 2005)

Based on the work of Joseph Schumpeter (1934), a pioneer in the subject, explains with the principle of "creative destruction" that innovation is essential for economic development since it is part of a process which consists in new technologies which replace old ones. He also explained that there are five different types of innovation: 1. the introduction of new products; 2. the introduction of new methods of production; 3. the opening of new markets; 4. the development of new sources for raw materials; 5. the creation of new market structures inside a branch of activity (Schumpeter, J., 1934 qtd. as cited in Organisation De Coopération Et De Développement Économiques, 2005, p.34). The reason why firms innovate has a huge importance. Is it to gain a competitive advantage? Is it to gain in productivity? Is it to be more cost efficient? The goal will determine what type of innovation to organize. (Organisation De Coopération Et De Développement Économiques, 2005, p.34).

As conclusion, it could be said that there will be a focus on four of the five types of innovations in this memory. The reason is that eco-design will tackle new materials or products as well as new techniques for a sustainable project, which should eventually open new markets.

ADDED VALUE

Added value is also a difficult term to define since it tends to be influenced by the perception of the person giving the definition. However, it is commonly agreed that it should be about becoming the customer's partner by documenting them. (Keough, J., 2002) As a result, I have chosen to explain it thanks to two specific sources, one related to design and another linking design and innovation, in order to follow and explain the sense of my problematic.

In their elaboration of a Design Dictionary, Erlhoff and Marshall (2008, p.11) defined added value as "an implicit idea of worth that extends beyond the functional requirement or basic use of a product or service to satisfy (a) need" (Erlhoff, M., Marshall, T., 2008, p.11). It influences how an information is communicated and, consequently, be allowed to approach the emotional part of the consumer. As a given example, there is the case of the luxury sports cars that will be made in order to play with the male feeling of the consumer which will eventually create a community which shares the same status. (Erlhoff, M., Marshall, T., 2008, p.11)

Therefore, and by respecting the correlation between design and innovation that Kahane (2015), who is an author of numerous articles on innovation, has made, in order for an entity to be more desired, the stress has to be put on the consideration of the political, social, economic and technical aspects as well as the emotional behaviours. (Kahane, B., 2015)

As a result, we could say that this notion could be used to grow an interest in sustainability with the use of environment-friendly materials or animal- and human-friendly production through the inclusion of the respect of their rights. Indeed, including the intimate beliefs and values of the consumers in the process, hence giving more space to ethics, allows the consumer to grow stronger bonds with the designers. In addition, it allows the designers to differentiate themselves on yet another field and it would make it easier for the consumers to choose the right creator for their projects. (Erlhoff, M., Marshall, T., 2008, p.11)

MY DEFINITION OF DESIGN

Thanks to the different definitions developed in the previous sections, I managed to understand the several aspects that are a part of the "design" concept and come up with a personal definition.

"Design is an innovation which allows to bring an added value to the users on an emotional dimension."

Indeed, design is an innovation in itself since they both include the notions of efficiency and the different steps needed in the process of creation. It starts with an idea which leads to a set of activities which will eventually result in the creation of an entity. Therefore, it is unpredictable since the needs may differ depending on the idea. Hence, it requires a lot of creativity to deal with the newness. At the end, design gives the consumer more than just the entity through its use on a psychological level, which is where relies the added value. Therefore, the innovation and the added value that it has helped being created both allows the designer to differentiate himself in the eyes of the consumers.

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The creation of meaning is what really differs between innovation and design. Indeed, while innovation takes the technical, economical as well as organizational aspects into consideration in the creation process, design also considers the social ones as well as how the user will react and use its creation. (Kahane, B., 2015)

Besides, innovation is completely about rationality since it is mainly basing itself on science or other aspects that are a part of the material reality, which is not the case of design. Design takes not only the material but also the immaterial factors such as how the reality is going to be presented. (Kahane, B., 2015)

As a final parallel, it can be said that, while both innovation and design are interested as much in the intention as in the way to get there, innovation remains focused on rationality in opposition to design which cares more about the sensitive sphere. (Kahane, B., 2015)

Nevertheless, they both share the same drawbacks. Indeed, they are not destined for sole individuals and they might change their mind along the way or have mixed feelings. In addition to that, the entity might not only impact the users but also other individuals such as the stakeholders. As a solution, Lizarralde, Larrasquet and Coutts suggest thinking of a business model as early as possible in the creation process in order not to forget about what value will be brought to the consumer as well as how it will be provided. (Lizarralde, I., Larrasquet, J., Coutts, N., 2011)

In a nutshell, based on what has been said previously, we can summarize the added value of design compared to innovation as the experience it can offer to the consumers.

Customer experience is "the internal and subjective response customers have to any direct or indirect contact with a company" (Meyer, C., Schwager, A., 2007). The experience can be provided by several manners depending on the way we design the products/services. For instance, through the different opportunities that will be developed later in this work, it will be possible to see that end users can get experience during the creation process or also thanks to devices which will allow them to have a preview of their interior, while not forgetting the final discovery, satisfaction and use of their project. As explained by Pine and Gilmore (1998), the experience is something really special that can sometimes be even separated from goods or services. Experiences have the characteristic to remain in the memory of the buyer as well as can be spread overtime. Besides, they both include "customer participation" and a "connection". The whole point is to aim the feelings and emotions of the consumers, which will be explained more in detail later in the work (cfr. p.32) (Pine, B. J., Gilmore, J. H., 1998).

Economic Distinctions				
Economic Offering	**Commodities**	**Goods**	**Services**	**Experiences**
Economy	Agrarian	Industrial	Service	Experience
Economic Function	Extract	Make	Deliver	Stage
Nature of Offering	Fungible	Tangible	Intangible	Memorable
Key Attribute	Natural	Standardized	Customized	Personal
Method of Supply	Stored in bulk	Inventoried after production	Delivered on demand	Revealed over a duration
Seller	Trader	Manufacturer	Provider	Stager
Buyer	Market	User	Client	Guest
Factors of Demand	Characteristics	Features	Benefits	Sensations

Source : Pine, B. J., & Gilmore, J. H. (1998). Welcome to the experience economy. *Harvard business review, 76*, 97-105.

Due to the focus that will be made on interior designers, it should be important to develop what affects them and how. Thus, the following will help get in depth with the issues that they have to deal with but also what it is benefiting them currently.

Firstly, let's develop the concept of "interior design".

As it can be seen, interior design is made up with two different words. Firstly, we have "interior" and then "design". Interior can either be used as an adjective as "situated on or relating to the inside of something; inner" or be used as a noun as "an artistic representation of the inside of a building or room" (Oxford Dictionaries, 2018). Even if design has been explained previously in this work (cfr. p.4), it can be useful to remind that it is "(...) a specification of an object, manifested by some agent, intended to accomplish goals, in a particular environment, using a set of primitive components, satisfying a set of requirements, subject to some constraints" (Ralph & Wand, 2009, p. 6).

An interior designer can be defined as "the one who imagines, structures and sometimes decorates public or private spaces (apartments, houses, offices, hotels, shops) by working on his own account or as an employee" (Ollivier, C., 2012).

Titan, Voineagu and Todose (2008) consider that interior design is a part of the creative sector. As income availability grows, so as long as the basic needs are met, consumers will tend to try to differentiate themselves through creative products. Interior design requires not only creativity but also technologies, notions about management and processes, and culture. (Titan, E., Voineagu, V., Todose, M., 2008)

SWOT ANALYSIS

This SWOT analysis will be on the interior designer. Hence, I will not evaluate a market but a profession. I will identify the strengths, weaknesses, opportunities and threats that interior designers face globally.

The choice to go for a SWOT analysis has been motivated by the fact that it seemed the most useful tool to analyze the profession of the interior designers. Besides, as we want to see how his role can be used for the better implementation of eco-design, it seems to make sense to go across every way that the environment affects him, what could be improved as well as what advantages can help us with the development of sustainable development. In other words, the main goal of this analysis is to get to know

more in detail the work environment of interior designers as well as what is pressuring or could be beneficial for him.

This analysis will be done through an international scope. Nevertheless, it will only be applicable to developed countries. Even if certain characteristics could possibly be applicable to any country in the world, most of the sources used in this analysis have done their researches in advanced regions which is why there will be a geographic limitation to them. Obviously, the role and the importance of interior designers in the different parts of the world can be different. However, what affects them can be common. As for the impact of culture, sources have shown no correlation with the components of this analysis. However, later in the work, there will be a focus made on Belgium thanks to the interviews of Belgian interior designers. It will also allow us to verify the political, legal, technical, social, environmental and economic specificities of the country.

STRENGTHS

Interior design benefits from **territorial anchoring**. It can be seen as a strength because it doesn't have to worry about potential competitors coming from abroad due to the fact that consumers prefer to deal with local actors. (Béraud, P., Du Castel, V., Cormerais, F., 2012) Territorial anchoring "constitutes a structural characteristic, with a strong influence on the innovation process, and on the conditions of valorisations of cultural goods. (…) It (…) is primarily based on the development of creativity, innovation and entrepreneurship ecosystems; on the availability of the factors of production; on the nature of the relationship with the cultural practices; and on the effectiveness of public policies. (…) It tends to turn the creative activities into specialized assets, with a better capacity to be differentiated from competitive or substitutable activities" (Béraud, P., Du Castel, V., Cormerais, F., 2012). As a result, it is not surprising that there is a strong local competitiveness. (Titan, E., Voineagu, V., Todose, M., 2008) However, such localized markets make it easier to create a reputation, "an implicit recognition", and make it harder for foreign actors to access the tools used. (Béraud, P., Du Castel, V., Cormerais, F., 2012)

Nevertheless, it shouldn't be forgotten to stay conscious about the phenomenon of globalization. As a result, initiatives should take place at a local level in order to deal with that. (Titan, E., Voineagu, V., Todose, M., 2008)

As well, the designers have to take so many aspects into account that they turn out to have to make various interactions with different sectors. Since they have to think about technical, economic and social conditions, it can be said that they are **polyvalent**. (Kahane, B., 2015)

In addition to that, interior designers have a **great capacity to adapt** to the clients' needs since they are perfectly aware that no customer is the same. Each user will be

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different and their opinions might not go the same way so, the designers have to be able to follow everyone's vision. (Lizarralde, I., Larrasquet, J., Coutts, N., 2011)

Lastly, many consumers use this sector as a way of communicating their values and attract others. As a consequence, it makes interior design a part of the **social** life of consumers. (Titan, E., Voineagu, V., Todose, M., 2008)

WEAKNESSES

Interior design is among the markets that suffer from **short-term** duration as well as the **high risk** it has to face. Certainly, due to the fact that it relies on creativity, the chances of failure are high. Moreover, due to its sensitivity to trends, it makes them **"highly volatile"** which raises the risks even more. (Titan, E., Voineagu, V., Todose, M., 2008) The **high fixed costs and highly specialized assets** it requires can also be real brakes for the industry. (Béraud, P., Du Castel, V., Cormerais, F., 2012)

Furthermore, due to its territorial anchoring, it has to deal with **spatial constraints**. Interior design might suffer from the "unequal distribution of natural resources". (Béraud, P., Du Castel, V., Cormerais, F., 2012)

As well, interior designers have it **difficult to protect intellectual property**. For instance, patents, which is "a government authority or licence conferring a right or title for a set period, especially the sole right to exclude others from making, using, or selling an invention" (Oxford Dictionaries, 2018), are not an option for them. As a result, it's hard to set rights for their work in order to prevent their ideas from being reused by competitors. (Béraud, P., Du Castel, V., Cormerais, F., 2012)

On the public aspect, they don't benefit from a legal recognition but more of an implicit one thanks to the name of their job which differentiate them from other markets. (Ollivier, C., 2012) For that reason, the **lack of regulations and interventions from institutions** could be seen as a weakness since they don't receive any help.

Lastly, due to the heterogeneity of the market, it is **hard to measure anything** related to it. For that reason, it could be difficult to predict behaviours among competitors and analyse the sector's information. (Titan, E., Voineagu, V., Todose, M., 2008)

OPPORTUNITIES

Numbers have shown that there is a **growing interest** in design by the population. People agree to spend more and more on creative sectors. (Titan, E., Voineagu, V., Todose, M., 2008) Due to its potential growth, opportunities are interesting to tackle.

Related to that, there are three main tracks that I will tackle later on: **co-design, the emerging technologies and the eco-design**. The reason why I will develop these three ways of approaching design is because they are the ones that allow a personalization of the products through use. (Kahane, B., 2015) These opportunities will be very interesting in the case of the research question because it will be shown that, if combined, they could help more introducing sustainable development in interior design. Indeed, they don't exclude each other which means that the development of eco-design could be fuelled by many ways such as the emerging technologies and co-design. Also, this section will demonstrate the fact that eco-design is suitable and could even be beneficial for interior designers, hence influencing considerably the answer to the research question.

I will also develop the influence of **globalization** that can represent a real opportunity for the interior designers.

CO-DESIGN

Co-design is an "experience-based design" which means that the user gets implicated in the design process. Hence, there are better chances that the user is satisfied with the final product since he helps with the improvement and finding out alternatives. (Côté, V., Bélanger, L., & Gagnon, C., 2017)
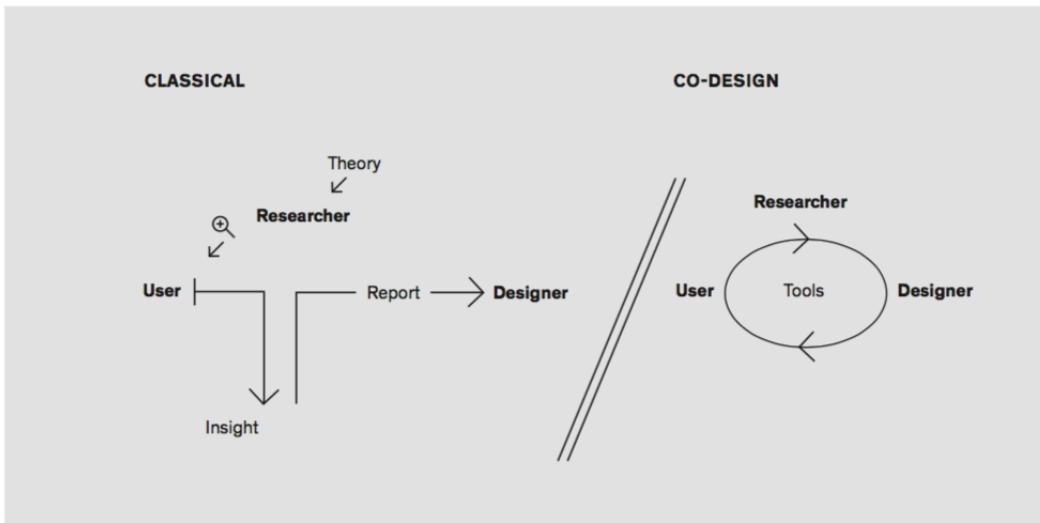
Source: Guerin, C., Chandesris, M., & Remy, A. (2016). Vers des algorithmes à dess (e) ins: intégration du design dans la conception d'une datavisualisation. *Sciences du Design*, (2), 30-50.

As shown by Guerin, Chandesris and Remy (2016), co-design can be explained as an ongoing cycle where the user, researchers and designers share the tools to the final creation.

Therefore, there is a feeling of democracy that is created since their opinion is being heard throughout the creation. (Côté, V., Bélanger, L., Gagnon, C., 2017) It goes with the fact that, in the XXI century that we're in, democratisation has been taking more space in the design sector, not only in terms of expression but also in the materials used. (Kahane, B., 2015)

As an example, in Quebec, the public health sector is trying to involve the patients and their entourage in the process of designing the hospitals. Indeed, the design of the interior can have an effect on the state of the person being taken care of. We can reduce stress or improve the healing process as well as the trust by working on lighting or the colours of the environment. (Côté, V., Bélanger, L., & Gagnon, C., 2017)

Does co-design mean that the designer gets less importance in the process?
The answer is "No". On the long run, it just changes the vision that people have of the interior designer. Indeed, he shifts from being a lonely and a person that is separated from the rest of the world to a coordinator. He brings his knowledge to work on the visual and physical aspect of the entity as well as his ability to work in the unknown. Hence, the user only helps to manage the added value that he will get from it. (Côté, V., Bélanger, L., & Gagnon, C., 2017) If we look at the bigger picture, designers are in charge of considering the technical and socioeconomic factors as well as reformulation of the projects with the limits of creation while keeping the experience at the center. (Pellerin, D., Coirié, M., 2017)

CLASSICAL APPROACH OF DESIGN	CO-DESIGN
Design of a product	Design of intention
Translation	Aggregation
Drawn by the form	Inspired by the collectivity
Resolution of an issue	Exploration
Forms determined by purposes	Open forms
External providers	Consolidated search
Single responsibility	Shared responsibility
Lots of expectations from the work of the designer	Fewer expectations from the work of the designer
Directed creative synthesis	Collective creative synthesis
Decision-making	Consensus search
Expression of an artistic sensitivity	Shared consensus

Source : Guerin, C., Chandesris, M., & Remy, A. (2016). Vers des algorithmes à dess (e) ins: intégration du design dans la conception d'une datavisualisation. *Sciences du Design*, (2), 30-50.

In this case, we can really see how the designer can manage the psychological aspect of his creations. He has to be able to translate the will and concerns of the users into something tangible. (Côté, V., Bélanger, L., & Gagnon, C., 2017) Co-design is an

opportunity that a shift could be shown in the design sector: a conversion from the will of creating something beautiful to something meaningful and that makes people feel good. The human becomes central in the process. (Pellerin, D., Coirié, M., 2017)

What are "emerging technologies"? They are "new technologies that are currently developing or will be developed over the next five to ten years, and which will substantially alter the business and social environment. These include information technology, wireless data communication, man-machine communication, on-demand printing, biotechnologies, and advanced robotics." (BusinessDictionary, 2018)

Access to information has tremendously changed since devices such as computers or smartphones, have led the individuals to have it easier to share or find information. Hence, the environment that has to be taken into account has evolved as well. (Wachter, S., 2009)

The new technology that has affected the most the interior design is definitely the 3-D visualization. It is an "electronic display of image data in three dimensions". (Lee, S., 2009)

It has changed how designers have been showing their ideas to the customers. Nowadays, the users can have simulations of what they are going to get. It represents a great tool for communication. Most users have little knowledge about design since they would be trained for that so, having 3-D images help better understand what the designers have in mind. It summarizes a complex and wide information. Now, the consumers can see the space prior its elaboration. For instance, how the light will be set up can be visualized before. Thanks to that, interior designers can be more productive because errors are less likely to be made. Also, it makes it easier to make changes according to the clients' needs as well as can be a great tool to show the different options they may have. (Lee, S., 2009)

VR (Virtual Reality) is the most commonly used of the 3-D technologies. "It is a stimulated environment in which users can interact with a virtual environment through a mediating technology. An immersive VR uses equipment such as Cave Automatic Virtual Environment and head-mounted display. Users feel and experience the virtual environment as if they are in virtual space. A non-immersive VR also provides users with a stimulated environment, but the stimulation is displayed on a screen for users to experience the environment. Users can manipulate and interact with the environment using input devices." (Lee, S., 2009)
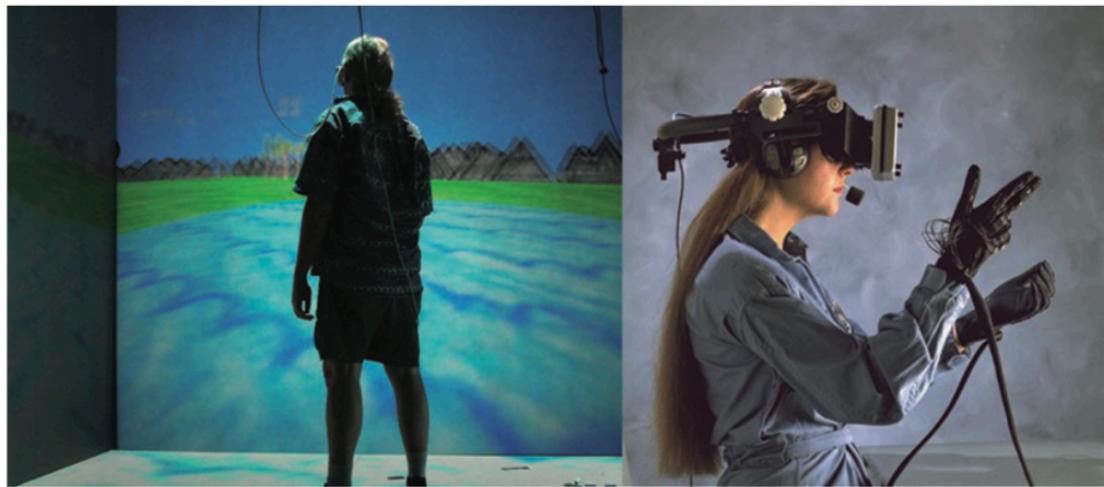
Source: Lee, S. (2009). The development of 3-D visualization technology: the potential impact on interior design and its consumers. *International journal of consumer studies*, *33*(5), 611-617.

AR (Augmented Reality) also exists which also stimulates the environment as in the VR technique but it mixes it with the real world thanks to computer-generated images. However, it is a lot less used due to its higher costs. (Lee, S., 2009)

Let us move on to the new technologies' positive aspects as well as drawbacks now.

Indeed, digitalization has opened the doors for a wider range of solutions in design. It has allowed to work better on presenting the models in the process in order to find better alternatives to cope with the need for interactions between the physical world and the cyberspace. In other words, it helped with the elaboration of different scenarios linked to electronic content. (Wachter, S., 2009)

Besides, as said previously, there's a will for democratisation. Hence, technology could help for that by working on the individualization of entities in order for the users to participate more. (Kahane, B., 2015) The rise of the technological devices has led to spheres of individualization which means that the individual can be divided through his different devices. Thus, together, they summarize his personal universe. (Wachter, S., 2009)

However, new technologies raise concerns related to the fact that they imply an automation of the designer decisions. Indeed, how could the designer ensure the security of the user in case of hacked system? If anything happens, who has to bear the responsibility? How could we insert ethics in an automated system? And most importantly related to the design work, how could automation preserve the creativity? All these questions act as deterrents as long as precise answers haven't been answered. (Béraud, P., Du Castel, V., Cormerais, F., 2012)

What could be interesting is the fact that new technologies could go in pairs with eco-design, which is the next point that will be tackled. Indeed, new technologies evolve with time and as a consequence, with the several moments of life. As a result, it could be modified to be linked with sustainability. Components could answer the conditions for a sustainable future by being biodegradable. (Wachter, S., 2009)

ECO-DESIGN

Eco-design enters in the theme of sustainability. But what is sustainability? It has been defined as the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, G.H., 1987).

Interior architects could directly be linked to eco-design since their work requires a lot of energy and resources which eventually damage the environment. Since they can affect the life of future generations and their surroundings, it makes sense that they would look for sustainable options. (Karslı, U. T., 2013)

Therefore, eco-design in the case of interior design is "design and practices that significantly reduce or eliminate the negative impact of interiors on the environment; (…) It is an approach that recognizes environmental impacts of the entire life cycle of interiors" (Karslı, U. T., 2013). It can also be called ESID as in "Environmentally sustainable interior design" because it ensures sustainability while having a focus on the healthy environment. (Hayles, C. S., 2015) Thus, eco-design isn't just about finding eco-friendly materials but more about trying to implicate sustainability in all aspects as to meet the clients' intentions. (McCoy, J., 2012)

Four variables can be identified for eco-design: energy, materials, water and the health. (Karslı, U. T., 2013)

Interior architects should look for options that push "energy conservation". To attain such goals, they have to remember two principles: energy-efficiency and renewable energy sources. For an interior to be called energy-efficient, natural lighting should be the focus through "skylights", "lighting control systems" or ventilation thanks to "adjustable windows". As for the energy that still had to be generated, passive energy conservation measures should be installed with systems that allow the prevention of heat losses or options that help economize the energy. Lastly, renewable sources such as sun and wind can help answering the needs in energy. (Karslı, U. T., 2013)

Energy
Reducing the energy used for lighting
At least 80% of spaces benefits from natural lighting and large surfaces are covered with light colour material.
Elements such as sky-gardens, skylights, atriums, light shelves are used to increase natural lighting.
Energy-efficient lighting equipment and lighting control systems are selected.
Reducing the energy used for ventilation
All spaces benefit from adjustable windows, air-holes or natural ventilation opportunities facilitated by channels.
Reducing energy used for heating and cooling
Passive recovery measures for reducing heating and cooling loads (thermal mass, etc.) are taken into consideration.
In order to reduce heating loads, measures are taken such as high insulation glass systems (low-e glass), double-wall applications.
In order to reduce cooling loads, measures are taken such as sunshades, movable blinds between glass layers, etc.
Use of renewable energy sources
Low emission but non-renewed energy sources or renewable energy sources like sun and wind are used in the building.
Material
Flexible design
Interior equipment elements are demountable, modular and expandable. Movable dividers are preferred instead of fixed walls.
Selection of eco-friendly material/equipment
Local materials are favored in construction instead of imported equipment with high energy of production and transport.
On large surfaces durable materials that do not require maintenance or replacement are selected.
Reducing waste
An existing structure is re-functionalized and redesigned.
Furniture used in interior is manufactured at standard sizes.
The doors, windows, insulation, and siding panels are mechanically inserted rather than cementing.
Recycled or re-utilized materials (glass, ceramics and steel recovered from demolition sites, wood etc.) are favoured in interior equipment.
Water
Recollection and reuse of water
Grey water and rain water is stored in the building, filtered and re-used in reservoirs or garden irrigation systems.
Selection of water-efficient equipment components
Local plants that require little water and water-saving irrigation systems are selected in interior and exterior landscapes.
Water-saving sanitary system equipments such as pressure reservoirs, waterless urinals, and low-flow photocell faucets are selected.
Health
Improving indoor air quality
Fresh air intake can be naturally facilitated via user-controlled adjustable windows.
Interiors are naturally ventilated; there is no need for an additional ventilation system as plan depth is not higher than 15 m.
Providing thermal, visual, and acoustic comfort
Interiors have the feature to manually control air movements and air temperature.
Depth of spaces are designed at max. 7m to benefit more from natural lighting.
The glare effect is diminished with measures taken on façade and at indoors (solar shading, glare-reducing glass, etc.).
Sound insulation measures are applied in order to reduce noise transmitted between floors and through installation systems.
Selection of non-harmful material
Materials like zinc, lead, wood preservatives containing formaldehyde or synthetic dyes which damage indoor air quality are not used.
Carcinogenic insulation materials like glass fibers, mineral fibers or asbestos fibers are not used in indoor.
In order to increase electroclimactic quality, natural material like wood and natural fabric are used..

Source: Karslı, U. T. (2013). Integrating sustainability in interior design studio. *Procedia-Social and Behavioral Sciences*, *106*, 1532-1539.

As for the materials, the three fundamentals that have to be remembered are flexibility, eco-friendliness and waste reduction. To satisfy the flexibility factor, the equipment used should be interchangeable and extensive as, for instance, "modular walls" or "movable furniture systems". In order to keep the environment in mind, resources should be collected on a local level. Lastly, waste can be reduced by using recycled materials such as wood or aluminium. (Karslı, U. T., 2013) The material is the aspect that people talk about the most due to its high impact, and "in particular commercial interior design projects, which are generally 'churned' every 5–7 years, placing a heavy burden on resources and creating large amounts of waste. (…) Interior furnishings, materials and

finishes require significant quantities of natural resources for their extraction, transport, processing, reuse, recycling and disposal." (Hayles, C. S., 2015)

To conserve water, systems such as "the reuse of rainwater or gray water and the selection of water-saving plumbing equipment" should be installed. (Karslı, U. T., 2013)

Lastly, to ensure the health of the users, air, comfort and non-harmful materials should be kept in mind. In order to improve the air in the interiors, materials that emit pollutants (as "formaldehyde and radon") have to be avoided. Then, in terms of comfort, several systems should be installed such as "heat and humidity sensors", "natural lighting with reduced glare effect" and "sound insulation". Finally, to reduce the emission of the materials used, it is suggested to the most natural materials "which protect the ion balance". (Karslı, U. T., 2013)

But does it really matter for customers of the developed countries?

In the XXI century, more and more consumers think about the consequences of their consumption. In order to control it, users tend to get more interested in movements such as upcycling. Such behaviour translates a change from the aesthetics focus to a growing interest for ethics. (Kahane, B., 2015)

Undeniably, the focus on how the environment, in disfavour for the harms it might cause on the consumers' health and environment, has switched for a better approach that targets sustainability in order to improve the individuals' lives as well as their responsibility in it. Several initiatives have been made in order to inspire people to make the right choices and make them more aware about the "World's limited natural resources". There is "a growing demand for healthier, more energy-efficient and environmentally responsible homes and work places; the establishment of Green Building Councils and their promotion of policies and programs aided to implement green building projects, such as BRE's Environmental Assessment Method (BREEAM), Code for Sustainable Homes (CSH), Leadership in Energy and Environmental Design (LEED), Green Star rating systems; municipalities offering incentives to 'go green', such as tax credits for the construction of buildings that are environmentally responsible; and e.g. Environmental Protection Agencies taking on more of a leadership role in actively mandating greener building policies." (Hayles, C. S., 2015)

Nonetheless, eco-design also suffers from constraints in the current market of interior design.

Firstly, the cost has been examined as the most important restraint. What could help with seeing it as less of a problem is a better perception of its importance. (Hayles, C. S., 2015) In other words, if sustainability is the main concern of the client, he will be less likely to care about the difference of price.

Secondly, client might be less likely to care about sustainability if it goes against his will for durability or aesthetics. As a result, it limits the designer since he has to satisfy his preferences and needs before anything. (Hayles, C. S., 2015)

Thirdly, interior designers might suffer from not having a wide range of materials to choose from. Furthermore, the doubts about the authenticity of suppliers in terms of reliability can be demotivating. (Hayles, C. S., 2015) That is to say that, for instance, some materials might require a long transportation which is problematic since it ends up not being as sustainable as it was planned to be.

Also, the time that is required to source the materials is problematic for interior design. Most of the time, interior architects have to face very tight schedules so looking for information about sustainable options as well as the addition time it takes to obtain the materials could be seen as a waste of time. (Hayles, C. S., 2015)

Lastly, the "lack of expertise and knowledge of materials" can be tricky for the elaboration of sustainable projects. Researches have proven that interior designers are not fully aware of the consequences of the materials used for their projects and have difficulties to find "accurate and accessible information" as well as the suitable means. (Hayles, C. S., 2015)

The education of interior designers and consumers on sustainability can be the solution to all of it. If eco-design had direct links with their values, it would have an impact on the selection of materials during the elaboration of the project. In other words, values affect behaviours so, if sustainability is cohesion with the person's concerns, they will be more likely to adopt sustainable options. (Hayles, C. S., 2015)

GLOBALIZATION

Globalization is a hard concept to define due to the fact that it involves every topic from the economy to politics and even culture.

Al-Rodhan and Stoudmann (2006) suggest, after a study on the various definitions that exist, the following definition: "Globalization is a process that encompasses the causes, course, and consequences of transnational and transcultural integration of human and non-human activities". (Al-Rodhan, N. R., Stoudmann, G., 2006)

Designers tend to be affected by the fact that people travel a lot more than before. Hence, when they see an entity, they like to know its providence which ultimately becomes a major information. It's the reason why international collaborations are on the rise. (Schneemann, P. J., 2010)

Globalization has also an impact on the imagination of interior designers. It pushes them to try other kinds of ways of working which would make them more apt to deal with the changes in the environment. As well, it makes them more aware of the competition and what could act as a substitute for them. It suggests possibilities of synergies to show the links that could be made between different ways of thinking. Overall, it can be said that it includes all the aspects that interior design has to be thinking about, such as the new technologies or the social movements. (Kontrimienė, V., Melnikas, B., 2017)

It is a stimulator for the research for new processes of creation and it forces to take the different lifestyles that could exist. Hence, stereotypes are less likely to come to mind and open-mindedness shall be put forward. Eventually, it would help with dealing with the volatile aspect of design. (Kontrimienė, V., Melnikas, B., 2017)

Lastly, it should be noticed that globalization has helped increase the interest of population in creativity which ended up with a rise in the global consumption. (Kontrimienė, V., Melnikas, B., 2017)

THREATS

Interior designers mainly have to offer their services to consumers locally but, they **have to compete with international actors.** (Titan, E., Voineagu, V., Todose, M., 2008) In other words, even if they meet the needs of people locally, they have to meet the international standards which are widely spread on the various media.

Also, it has to be said that the **co-design** interest can be dangerous for the interior designers because integrating the users only adds complexity to the process. In addition to the thinking and all the information that he has already to take into account, he also has to make decisions related to new entities while ensuring the satisfaction on the aspects that the consumer has expressed himself on. In other words, in co-design, the designer has to work for but also with the stakeholders. (Côté, V., Bélanger, L., & Gagnon, C., 2017)

Furthermore, **digitalization** could lead to the reduction of the importance of the entity. Actually, the entity could become so futile to leave space only for the digital context it would be surrounded by. It could also lead to the creation of "autistic" entities, which means that the entity would be created in order to cope with the trend of new technologies but would not take the environment into account. (Wachter, S., 2009)

Even though digitalization retains opportunities for new solutions, it could also reduce them if there is a focus solely on the technological functionalities. For instance, there are risks that the social dimension would be overshadowed by the will of finding answers to what has been created in the software used. We must not forget that design

process is, foremost, mastered by humans which is why it has to deal with many different aspects that might lead to contradictions. In order not to fall in the obsession for technologies, they have to remain tools to improve an entity and not the opposite. (Wachter, S., 2009)

Another aspect that influences considerably the interior designers is the **Do It Yourself (DIY)** phenomenon. There are four kinds of DIYs : "proactive" which means that the efforts are "self-directed" and which is mostly done as leisure or for financial means ; "reactive" which stands for leisure but directed thanks to diverse tools such as kits ; "essential" which is mostly done in the context of "home maintenance" and is mostly done for economic reasons ; "lifestyle" which is also related to "home maintenance" but fuelled "by choice rather than a need" (Atkinson, P., 2006). It finds its roots in the movement of democratisation of the design process. As a result, we have more "self-driven, self-directed amateur design and production activity carried out more closely to the end user of the goods created" (Atkinson, P., 2006). Along with this, there is the use of interfaces for consumers such as "manuals, guide books, magazines" and even media and online platforms such as Pinterest (Atkinson, P., 2006). In addition to being a reaction to the previous perception of design as being something granted for high social classes, it has also "acted as a leveler of class, overcoming the social stigma of manual labor out of sheer necessity, and permitting the working class to engage in leisure activities from which they were previously excluded" (Atkinson, P., 2006). Furthermore, it is an occasion for consumers to develop their self-identity through their work, transitioning from the position of consumers to "an agent of design" (Atkinson, P., 2006). Although positive for the consumers, it can also be a major threat for interior designers as it means that people would be less likely to ask for their services and would, instead, try to do their job in their own conditions.

Lastly, there are the **mass production manufacturers** that work in the interior design sector. As an example, let's take the most famous on: IKEA. As evoked in the explanation of the DIY phenomenon, design used to be for the wealthy social class. In other words, only people who could afford to pay for creative specialists were to make something original with their interior. As a reaction to that, IKEA arrived to offer simple yet affordable and great visually furniture and interior design services. Therefore, it has been seen that people are more aware and educated on design since it has changed "how we shop, how we put it together and how it looks" (Bhattarai, A., 2018). Furthermore, it has become an international structure in order to provide anyone with all kinds of tastes anywhere in the world, even managing the online shopping storm. It has succeeded in delivering an experience to customers through their shops and services. To finish it up, they included the customers in the creation process by letting them set up the furniture, creating a feeling of involvement while making it easier for IKEA to sell cheaper products and services. (Bhattarai, A., 2018) This aspect can be a threat to interior designers because, just as DIYs, it could mean that people would be less likely to ask for their services since they would have less expensive alternatives.

Strengths	Weaknesses
- *Territorial anchoring.* - *Polyvalence.* - *Great capacity to adapt.* - *Related to the social life of the consumer.*	- *Short-term oriented.* - *High risks.* - *Highly volatile.* - *High fixed costs & highly specialized assets.* - *Spatial constraints.* - *Difficulty to protect intellectual property.* - *Lack of regulations & interventions from institutions.* - *Hard to measure the market.*
Opportunities	Threats
- *Growing interest of the population.* - *Co-design.* - *Emerging technologies.* - *Globalization.*	- *Local consumers but international competition.* - *DIY trend.* - *Mass production manufacturers.* - *Co-design could add complexity in the process.* - *Digitalization could cause the reduction of the importance of the project + overshadow other dimensions.*

Considering what has been highlighted as the added value that interior design delivers as well as the SWOT analysis of the interior designers that has been done, it seems important to analyse the consumer since he can influence the changes that the industry is going through.

Firstly, let's define what we mean with the term "consumer". According to Oxford Dictionaries (2018), it is "a person who purchases goods and services for personal use". (Oxford Dictionaries, 2018) However, BusinessDictionary (2018) brings a definition that seems to integrate another vision of the concept since it says that it is "an end user, and not necessarily a purchaser, in the distribution chain of a good or service". (BusinessDictionary, 2018) To sum these two up, we could say that it is any individual that uses a good or a service.

I will begin by explaining the notions of values and needs. Why? For many years, these concepts have been studied in the marketing field. Many authors suggest that these are factors influencing the decision-making of consumers. As a result, it seemed logical to me to develop these aspects since this section is supposed to focus on consumers and their choices.

Later in this section, I will move on to the emotional dimension. As explained previously (cfr. p.4), design approaches three dimensions: the economic dimension, the technical dimension as well as the emotional dimension. However, the emotional one seemed to be the most influencing factor for consumers' decisions, hence why it will be tackled here.

I will finalize this analysis by tackling the subject of green consumption. Indeed, in order to link this section to my research question, this topic must be developed as it is directly impacting its outcome.

VALUES

Let's first define what a value means. Rokeach (1973) defines it as "enduring prescriptive or proscriptive believes that a specific mode of conduct (instrumental value) or end state of existence (terminal value) is preferred to another mode of conduct or end state". (Rokeach, M., 1973) Thus, we understand that there are two different types of values: "instrumental" ones which are more related to attitudes and "terminal" ones which refer to a final result.

Before getting into details by explaining the different values, it must be stressed that this section isn't connected to the notion of added value that has been described in the problematic. Although they both imply something that hits the consumer at its core, added value was developed in a sense which is rather supplemental, while this section really is about the fundamentals of the human beings.

According to Sheth, J. N., Newman, B. I., and Gross, B. L. (1991), consumers' purchase behaviour is influenced by the five following values: functional value, conditional value, social value, emotional value as well as the epistemic value. Each value finds its theoretical origins in different models such as Maslow (1943, 1954, 1970), Kantona (1953, 1971), Katz (1960) and Hanna (1980). (Sheth, J. N., Newman, B. I., Gross, B. L., 1991)

Let's tackle each of these values.
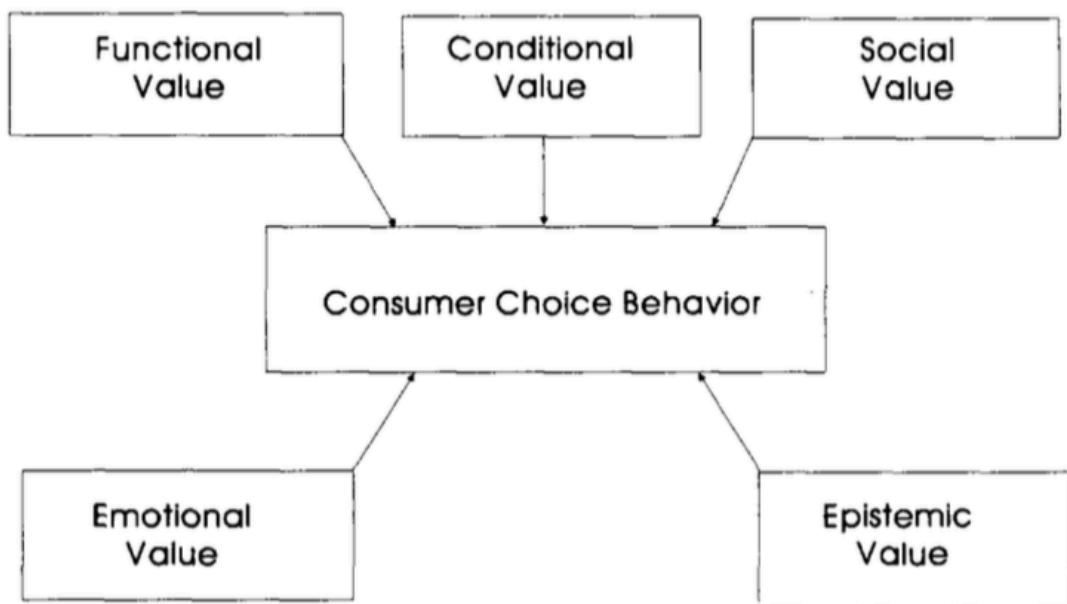
Source: Sheth, J. N., Newman, B. I., & Gross, B. L. (1991). Why we buy what we buy: A theory of consumption values. *Journal of business research*, *22*2), 159-170.

Firstly, we have the "functional value", known as "the perceived utility acquired from an alternative's capacity for functional, utilitarian, or physical performance; (it) is measured on a profile of choice attributes." (Sheth, J. N., Newman, B. I., Gross, B. L., 1991) That is to say that consumers look at the utility they will get from enjoying a certain product. This value has been known for a long time and has been used for advocates of the "rational economic man", such as in the theories of Marshall (1890) and Stigler (1950). (Sheth, J. N., Newman, B. I., Gross, B. L., 1991)

Secondly, there is the "social value" as in "the perceived utility acquired from an alternative's association with one or more specific social groups; (…) with positively or

negatively stereotyped demographic, socioeconomic, and cultural-ethnic groups; (it) is measured on a profile of choice imagery." (Sheth, J. N., Newman, B. I., Gross, B. L., 1991) Indeed, factors as the visual aspect as well as the opinion of others on it are related to the social value. Besides, the influence of a social class or group can have an effect on our consumption since products can be used as a source of informal communication and information. (Sheth, J. N., Newman, B. I., Gross, B. L., 1991)

Thirdly, there is also the "emotional value" as in "the perceived utility acquired from an alternative's capacity to arouse feelings or affective states; (it) is measured on a profile of feelings associated with the alternative." (Sheth, J. N., Newman, B. I., Gross, B. L., 1991) Our emotions can be targeted when working on the appearance or the senses related to the products or services. This value has been discovered thanks to Dichter (1947) who made researches on motivation, several other researchers related to the marketing field, Paivio and Begg (1974) who studied the approaches for data treatment, but also Orstein (1972) and Hansen (1981) who considered the information analysis process that the two hemispheres of the brain do. (Sheth, J. N., Newman, B. I., Gross, B. L., 1991)

Afterwards, we have the "epistemic value" which is "the perceived utility acquired from an alternative's capacity to arouse curiosity, provide novelty, and/or satisfy a desire for knowledge" (Sheth, J. N., Newman, B. I., Gross, B. L., 1991). Through this value, we mean the feeling of newness or modification. This can occur when consumers feel satisfied with the product or service that they have had or want to try new things. (Sheth, J. N., Newman, B. I., Gross, B. L., 1991)

Lastly, the "conditional value" is "the perceived utility acquired by an alternative as the result of the specific situation or set of circumstances facing the choice maker (…) in the presence of antecedent physical or social contingencies that enhance its functional or social value; (it) is measured on a profile of choice contingencies." (Sheth, J. N., Newman, B. I., Gross, B. L., 1991) This value refers to the fact that given situations will influence our behaviour. Indeed, the behaviour cannot solely be based on the individual's mindset or plans. (Sheth, J. N., Newman, B. I., Gross, B. L., 1991)

Considering the description of the values that has been made, three remarks have to be said.

Firstly, "choice is function of multiple consumption values". (Sheth, J. N., Newman, B. I., Gross, B. L., 1991) In other words, a consumer's choice can be affected by the different values that have been explained, all at the same time.

Secondly, "the consumption values make differential contributions in any given choice situation" (Sheth, J. N., Newman, B. I., Gross, B. L., 1991). It means that our behaviour might take its main sources in specific values, undermining the importance of the other ones. A certain choice doesn't imply the same implication of all five values.

Lastly, "the consumption values are independent" (Sheth, J. N., Newman, B. I., Gross, B. L., 1991). The values that affect our behaviour don't have links between each other. Indeed, it might even occur that one value goes against another one, which will push the consumer to prefer one value instead of another.

VALUES AND DESIGN

Kumar and Noble (2016) studied the link between consumers' values and the product design in order to eventually understand design's effect on consumers' behaviour.

There are four values that have been highlighted and form "SAFE": as in social, altruistic, functional and (a)esthetic. They have been found thanks to a qualitative and quantitative research on product design. (Kumar, M., Noble, C. H., 2016)

Firstly, there is the "social" value which is the "ability to help consumers increase their perceived status in the community and/or improve their self-esteem" (Kumar, M., Noble, C. H., 2016). In other words, this aspect allows the consumer to express and identify himself through the design of the product, allowing a thoughtful approach since it pushes him to think of himself related to other individuals. Also, it can help others to have a better vision of themselves when they think about how they look thanks to the product or when they use it. (Kumar, M., Noble, C. H., 2016)

The next value is the "altruistic" one. It is defined as "the consumer's perception of how it enables them in helping other individuals and the society at large." (Kumar, M., Noble, C. H., 2016) Indeed, products' design can allow the consumers to communicate their concerns about the environment that they are in. In other words, it helps him to think about ways to help others while still identifying himself in the product. As a result, there are no doubts that this is the value that could be related to sustainability and ethics problematic. (Kumar, M., Noble, C. H., 2016)

The third value is "functional" which means "it helps meet the practical or utilitarian needs of the consumer". (Kumar, M., Noble, C. H., 2016) It is linked to the conscious processes of the consumer. Hence, it is related to all the characteristics that are useful to the user as for instance effectiveness or safety. In a nutshell, it is relevant to the utilitarian theory. (Kumar, M., Noble, C. H., 2016)

The last one is "(a)esthetic" value and is defined as "the consumer's perception of attractiveness and pleasure derived from its appearance" (Kumar, M., Noble, C. H., 2016). This value is known to be hedonic, so related to positive sensations such as

pleasure, and is related to our subconscious. This is the value we play with in order to attain a certain attractiveness in the eyes of the user. (Kumar, M., Noble, C. H., 2016)

Before developing the needs, this notion should be explained. BusinessDictionary (2018) defines a need as "a motivating force that compels action for its satisfaction; (they) range from basic survival needs (common to all human beings) satisfied by necessities, to cultural, intellectual, and social needs (varying from place to place and age groups to age groups) satisfied by necessaries." (BusinessDictionary, 2018) I chose this definition because it was the one that was the closest to the idea that Abraham Maslow tried to make us understand. Indeed, it fully explains that a need is over once it is satisfied and that there are different types dependant on the motivation underneath.

When it comes to needs, Abraham Maslow's theory of its hierarchy is very useful. Cherry (2014) studied his work and realized that, in order to fulfil specific needs, basic needs need to be satisfied first, reason why they are often represented in a form of a pyramid. (Cherry, K., 2014)

Self-actualisation
(Achieving individual potential)

Esteem
(self-esteem and esteem from others)

Belonging
(Love, affection, being a part of groups)

Safety
(Shelter, removal from danger)

Physiological
(Health, food, sleep)
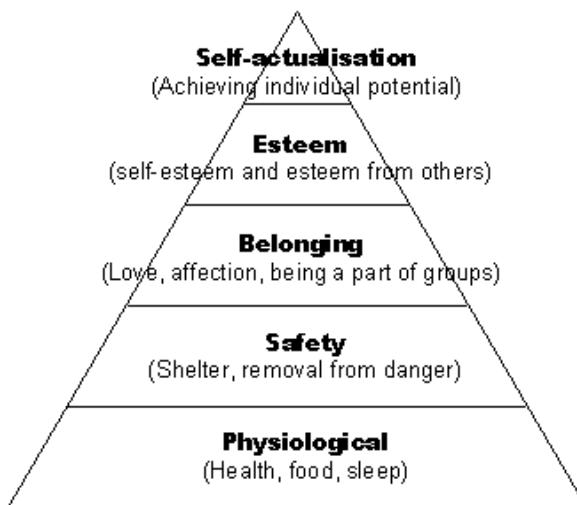
Source: Cherry, K. (2014). Hierarchy of needs. *Retrieved Aug, 16,* 2014.

As we can see, the higher we are in the pyramid, the more complexed the needs are. Also, each level shows that there is a tendency to satisfy more individual physiological needs. Since needs affect considerably our behaviour, it is very important to understand them in order to fully comprehend why consumers act a certain way. (Cherry, K., 2014)

Before explaining the different levels of the pyramid, it has to be said that the last level isn't of the same type as the others. Indeed, while physiological, safety, belonging and esteem needs are considered as "deficiency needs", self-actualisation is rather of a "growth need". It is explained by the fact that, on the one hand, the four first levels exist

due to the lack, the privation, of something, and on the other hand, individual potential arises from the person and not as a consequence from something. (Cherry, K., 2014)

Let's move on now to the five different levels of the pyramid of Maslow.

Firstly, we have the "physiological needs", known as "the most basic needs that are vital to survival, such as the need for water, air, food and sleep" (Cherry, K., 2014). It is the first level of the pyramid because these needs are acknowledged as being the first concerns before anything else. If these needs are not satisfied, all the other needs will be considered as secondary. (Cherry, K., 2014)

Secondly, there are the "security needs" which are all about avoiding danger and looking for "safety and security". (Cherry, K., 2014) They are also very important but not as primary as the physiological ones, which is why they only come on the second level. (Cherry, K., 2014)

Thirdly, come the "social needs" related to "love and affection". (Cherry, K., 2014) This level is connected to others because the individuals will look to satisfy such needs through their relationships. (Cherry, K., 2014)

"Esteem needs" come next. They "include the need for things that reflect on self-esteem, personal worth, social recognition and accomplishment" (Cherry, K., 2014). In other words, it is what we look to achieve externally and our concerns with what people can think about us. (Cherry, K., 2014)

Lastly, there are the "self-actualizing needs" which are "self-aware, concerned with personal growth, less concerned with the opinions of others and interested fulfilling their potential" (Cherry, K., 2014). Through this level, we see that all of our concerns are about our own psychological opinion of ourselves. It is all about us and the rest of the world doesn't matter anymore. The individual will really look to achieve what he can be. As a result, it can be said that it is the most self-centred level. If we manage to reach that level, we will have a more realistic vision on everyone, a higher feeling of ethical responsibility and a better tendency to adapt, be independent, be more inspired as well as more appreciative of things. (Cherry, K., 2014)

In the case of this work, it could be said that interior design aims to answer to all of these needs simultaneously. Indeed, interiors affect people's health through the different materials and techniques used. Also, the space that is built and designed aims to provide a feeling of shelter for its user. As for the social and esteem needs, an interior designer will make sure that the project reflects his customers' personal vision of himself and his world while making sure that it will also be approved by other individuals close to the user in order for him fulfil his need for acceptance from others. To finish up, the customer will be helped in his search for personal growth since he will be provided with

a brand-new environment and be brought even further than his own imagination thanks to the interior designer.

Emotions are referred as "a mental state of readiness that arises from cognitive appraisals or events or thoughts; they are typically elicited by events, objects or people". (Bagozzi, R., Gopinath, P., Nyer, M., 1999) Achar, So, Agrawal and Duhachek (2016) define it as "multidimensional feelings that reflect information about consumers' relationship to their social and physical surroundings as well as their interpretations regarding these relationships". (Achar, C., Jane, S., Agrawal, N, Duhachek, A., 2016)

As far as design is concerned, it should take the emotional sphere into account as it is being more and more in the centre of our society. It relates to "the rise of people searching for individuality, inner orientation and self-searching experiences". (Crossley, L., 2003) People tend to value experiences which lead designers to try to create some kind of story through their creations. By doing so, consumers feel more involved and relate more. In order to reach users' sensitivity, designers have to have a qualitative approach which will allow them to understand better their needs and desires. In some way, it can be said that designers shift from simply answering the client's demands to becoming a real associate. Taking into account everything that affects the client's emotions offers the possibility to have a holistic vision and connect with him. As a result, empathy should be a key element that the designer has to keep in mind. (Crossley, L., 2003)

In order to understand fully the emotional dimension of consumers, designers should follow the five following stages: "immersing, storytelling, observing, creating and communicating". (Crossley, L., 2003)

The first stage, "immersing", consists in understanding the background of the users, the context in which they are living in. It is based on the

Source: Crossley, L. (2003). Building Emotions in Design. *The Design Journal, 6*(3), 35-45.

"knowledge, attitudes, aspirations and values" of the consumers because it gives an insight on why the consumers are understanding and behaving a certain way. (Crossley, L., 2003)

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Next is the "storytelling" phase which relates to the previous experiences of the client. Empathy is really tackled here because it requires the designer to put himself in the place of his client to better understand him. Thus, listening is key for this step since only the consumer can explain the events he faced in the past. To some extent, design is mainly about creating a relationship between the user and the entity. Then, it makes sense to study the existing relationships that the consumer has. (Crossley, L., 2003)

Thirdly, "observing" is fundamental. Instead of asking for the consumer's vision, the designer will see how he behaves in order to understand what brings him positive emotions or the opposite. This step is essential since it is one of the less subjective ones because we stick to facts, nothing is transformed by the consumer. However, it remains hard to set this step up because most of the tools and techniques that the designer could use, such as observations or disposable cameras, have limits since they still end up affecting the consumer's behaviour, hence influencing what could be taken out of it. (Crossley, L., 2003)

The fourth element of the process is "creation". Based on what the three different steps that had taken place before, designers will relate on the information that they have found but will also use their own intuition in order to find inspiration. Thus, it can be said that this element combines the problem-solving and the creativity. (Crossley, L., 2003)

Last but not least, comes "communicating". Through this element, the presentation is important in order to ensure the consumer's final experience. So that it could be done, there are two different aspects that are crucial: "immersive spaces" and "compelling visions". (Crossley, L., 2003) The first one refers to the fact that the more people can imagine and get into the new ideas, the more positive the development will be. As for the second aspect, it is all about making sure that the right emotions are provoked in the presentation of the ideas through a real connection with the results of what has been seen earlier. (Crossley, L., 2003)

GREEN CONSUMPTION

Now that the different aspects that influence consumers' decision-making in general have been explained, it is important to make the link with sustainability. Indeed, as the research question is related to eco-design, consumption related to environmentally friendly alternatives should be considered carefully.

As said in the previous paragraph, green consumption goes along with the idea of sustainability. It is because it is fully about implementing sustainability throughout the "manufacturing" process and "supply chain management" while keeping a particular focus on the environment at each step. (Maniatis, P., 2016)

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Green consumption has grown over the years due to the growing concerns over global warming all over the world. Moreover, it has helped reduce "harmful side effects, hazards, toxic substances, health issues" and has also "improved recyclability and environmental friendliness". (Maniatis, P., 2016)

However, green consumption can seem contradictory since "green implies the preservation of natural resources while consumption generally involves their destruction". (Peattie, K., 2010) However, it aims "products designed to lessen the consumption of required natural resources and minimize the adverse environmental impacts during the whole lifecycles of these products". (Liobikienė, G., Mandravickaitė, J., Bernatonienė, J., 2016)

Developing environmentally friendly consumption is important since consumers can affect considerably the sustainable production. Indeed, they represent the majority that consumes the final products, 60% of the overall consumption of the countries a part of the OECD to be more precise. As a result, their behaviour could represent a great stimulator for sustainable growth through a greater interest for green products. Since the consumers' concerns and approaches have been on the rise these past few years, it seems relevant to develop this aspect. (Tan, L. P., Johnstone, M. L., Yang, L., 2016)

BEHAVIOUR

Behaviours are important to analyze in the case of green consumption because it will help to understand how the perception of sustainability and the environment can predict consumers' buying behaviours. Also, in order to provide a solution to current damages to the environment, we must understand what leads to the behaviour of going for green alternatives. (Paul, J., Modi, A., Patel, J., 2016)

In most articles that I've found, and as confirmed by Paul, Modi and Patel (2016), I have realized that one model was used to analyze the green consumption phenomenon: The Theory of Planned Behaviour (TPB) of Ajzen (1991). It helps better psychology that hides behind the purchase of green goods. (Paul, J., Modi, A., Patel, J., 2016)

Before TPB, Ajzen, alongside Fishbein (1975) came up with the Theory of Reasoned Action (TRA). While TRA was studying "the role of personal/social factors", TPB extended it with "the influence of added non-volitional factors". (Paul, J., Modi, A., Patel, J., 2016) The theory of reasoned action was really focused on the intentions of consumers as it can predict individuals' reactions as well as how they will process information. Therefore, it surely tackles the cognitive process that people go through when making decisions. TRA was then crucial to see when a person would finally be consuming green products or behave in an environmentally friendly manner. However,

TPB has expanded the model with the "non-volitional control-perceived behavioural control factor", which means the factor that controls behaviours that are seen as non-voluntary. In a nutshell, the Theory of Planned Behaviour helps us better predict the purchase intentions of consumers by explaining the relationship between intention and what leads to it. (Paul, J., Modi, A., Patel, J., 2016)

Paul, Modi and Patel (2016) suggest three intentions' determinants from the TBC model (attitude, subjective norm and perceived behavioural control (PBC)) and adds the environmental concern (EC) in order to be very specific to green consumption. (Paul, J., Modi, A., Patel, J., 2016)

Let's begin with attitude towards the behaviour. Ajzen (1991) defines it as "the degree to which a person has a favourable or unfavourable evaluation of the behaviour in question". (Ajzen, I., 1991) In other words, attitude incorporates the opinion that we have on things, our judgment, as well as how we perceive what will happen if we behave a certain way. Attitude is crucial to anticipate individuals' behaviours because it is based on our own information process. As far as environmentally friendly goods are concerned, if an attitude is positive, the behaviour will tend to follow. (Paul, J., Modi, A., Patel, J., 2016)

The next concept tackled was the subjective norm, as in "the perceived social pressure to perform or not to perform the behaviour". (Ajzen, I., 1991). It means that it develops the influence that other individuals that we value have on us, so the social pressure that we might feel to act a certain way. If people tend to be in favour of green consumption, the individual will have more tendency to follow this positivity. (Paul, J., Modi, A., Patel, J., 2016)

Thirdly, there is the perceived behavioural control which refers to "the perceived ease or difficulty of performing the behaviour". (Ajzen, I., 1991) It is linked to what an individual has lived before as well as how he thinks that things will go. That is to say that it relates to aspects that come from the outside and that are quite wide. If our PBC for green products is positive, we will be more likely to go through the purchase phase. (Paul, J., Modi, A., Patel, J., 2016)

Lastly, there is the environmental concern which is "the degree to which people are aware of problems regarding the environment and support efforts to solve them or indicate the willingness to contribute personally to their situation". (Dunlap, R., Jones, R., 2002) It has been shown through various studies that, if concerns about the environment are growing, people will be more willing to consume eco-friendly. (Paul, J., Modi, A., Patel, J., 2016)

While green consumption has been on the rise, there must also be factors that slow down its development. Moreover, we must analyze these aspects that are acting as barriers to green alternatives as the subject of this research is one of them. This analysis will be very useful when tackling the limiting factors of eco-design.

It has been demonstrated that green consumption suffers from several barriers. Indeed, as Tan, Johnstone and Yang (2016) have shown in their study, environmentally friendly behaviours aren't mainstream yet due to several issues related to the perception of green products. Indeed, attitudes and behaviours are usually influenced by how we interpret and perceive things. In the case of their study, they looked at all kinds of consumers since green consumers still remain a minority in the current market. (Tan, L. P., Johnstone, M. L., Yang, L., 2016)

Firstly, let's tackle the barriers that have been confirmed worldwide beforehand. These barriers are the price and lack of knowledge of the different goods. Besides, the perception of a group, trust issues over the quality as well as the perceived risks that result from that can also be influencing factors. (Tan, L. P., Johnstone, M. L., Yang, L., 2016)

Let's move on to the results of the study of Tan, Johnstone and Yang (2016).

The first aspect that has been studied is the perception of the "green" specificity of products. It has been shown that if a consumer sees green products as less favourable, it could affect its tendency to initiate a sustainable behaviour. Even further, if a person sees others who undertake an environment-friendly behaviour from a bad eye based on their scepticism on the existing green communication canals, it could also affect their tendency to consume green. Additionally, if an individual feels as if he doesn't have much effect on the environment unless he's supported by a group movement or if he perceives the eco conception as a minor part of the market, it might also be a reason why he would avoid going for sustainable options, regardless of his beliefs. As a solution, government involvement could be helped through supporting the enterprises that go for sustainable alternatives or through placing incentives to push citizens to go for green options. (Tan, L. P., Johnstone, M. L., Yang, L., 2016)

Also, there are the perceptions of the green products themselves. It concerns the trustworthiness of the goods as well as the fear for a lesser performance. Such understandings can affect the attitudes and intentions of consumers in a negative way. Once again, governments could help by intervening on the market by providing options to reassure the citizens about the green products. Enterprises also need to work on this factor since they could, through their marketing processes, work on the way that the

performance of the environmentally friendly goods is presented. This factor is interesting since it shows that, foremost, the consumers care about the utility of their goods. (Tan, L. P., Johnstone, M. L., Yang, L., 2016)

Thirdly, green consumption suffers from some kind of "stigma". Indeed, consumers don't always have a great image of green consumers which could be one of the leading factors for a lesser tendency to go environmentally friendly. As explained earlier (cfr. p.35), individuals have a need for a "positive social identity". Therefore, they could really be immunized to green suggestions due to their fear of rejection. Thus, there is a real need for working on eliminating stereotypes which are surrounding the green markets and making it look more "normal". In other words, we should make sure that these options seem as mainstream as the other existing options. (Tan, L. P., Johnstone, M. L., Yang, L., 2016)

Along with what has previously been said, the attitude towards the urgency of the situation of the environment as well as the feeling that adopting an eco-friendly behaviour requires lots of efforts are also barriers that came out of the study. Moreover, consumers feel as if they should have fewer responsibilities to be able to go green. It is the reason why the older the people are, the readiest they will feel to consume eco-friendly goods. In other words, being environmentally friendly is currently seen as being a real effort and difficult. The solution for this barrier could be joined by the previous one, which is trying to "normalize" the green consumption. Furthermore, the gains from consuming green, such as "emotional gratification", should be put forward since individuals still seek for personal gains than overall ones. (Tan, L. P., Johnstone, M. L., Yang, L., 2016)

Lastly, Tan, Johnstone and Yang (2016) stress the need for product evaluations through trials or reviews. Indeed, direct and indirect experiences have a tendency to build confidence in goods which could affect positively the perceptions of consumers since it would reduce the risk feeling and expand the use of green products. (Tan, L. P., Johnstone, M. L., Yang, L., 2016)

Since the research question will be linked to eco-design, sustainable development must be developed here for a better understanding of why eco-design exists and what it is linked to. Indeed, there are several notions that are implied in this opportunity and they will be developed in this section.

As defined previously (cfr. p.19), sustainability is the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, G.H., 1987). However, Brundlandt's report has allowed ambiguity which could cause confusion when the subject is talked about. (Hopwood, B., Mellor, M., O'Brien, G., 2005)

Kates, Parris and Leiserowitz, (2005) went more in depth for this concept in order to understand the definitions given for sustainable development.

Firstly, "what is to be sustained?" is a major question in sustainable development. As answers, there are three categories: "nature, life-support systems, and community". Each of these categories can also be developed more in detail (e.g. community: cultures, groups, places). Their studies have shown that people tend to focus on the "life support systems" part since it's the one that focuses on the environment as a resource for humans, reinforcing their utilitarian need. (Kates, R. W., Parris, T. M., Leiserowitz, A. A., 2005)

Secondly, there is the following question: "what should be developed?". The three elements that were brought were "people, economy, and society". Although, the focus, in the past, has mostly been on the economy, it has now shifted to people through an interest for "increased life expectancy, education, etc.". (Kates, R. W., Parris, T. M., Leiserowitz, A. A., 2005)

Since the 2002 World Summit on Sustainable Development, three pillars have been brought out: "the economic development, the social development and the environmental protection". The goal of sustainable development should be to strengthen these different notions while ensuring that they are connected to each other. These pillars join the question on what should be developed since the economic development focuses on the economy of the nations, the social development mainly tackles the role of humans, while the environmental protection looks at the society as a whole and its responsibility towards what is surrounding it. (Kates, R. W., Parris, T. M., Leiserowitz, A. A., 2005)

Vilalta-Perdomo, Michel-Villarreal and Corliss (2017) develop these pillars as "connected rings (…) with the implication that each sector is, at least in part, independent of the others". (Vilalta-Perdomo, E., Michel-Villarreal, R., Corliss, J., 2017) This model is known as the "Triple Bottom-Line" which implies to "maximize the profit and human
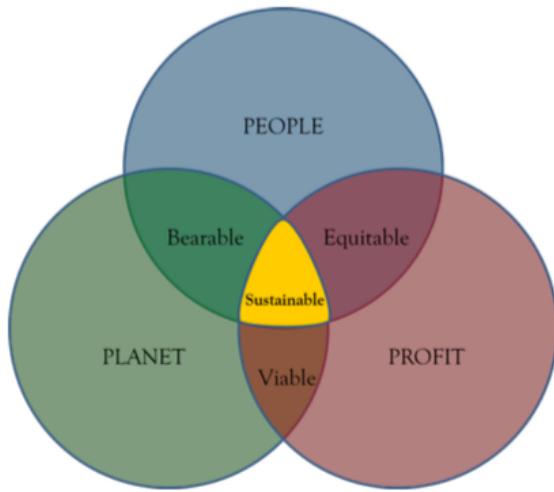
Source : Vilalta-Perdomo, E., Michel-Villarreal, R., & Corliss, J. (2017). On defining 'sustainability'. An impossible task? *IIE Annual Conference. Proceedings,* 398-403.

while environmental side effects are minimized". (Vilalta-Perdomo, E., Michel-Villarreal, R., Corliss, J., 2017) The three dimensions are connected and dependent on each other. However, the TBL can provoke issues since it could lead to solutions or reactions which would want to tackle the three dimensions in a separated way. Indeed, by determining the different pillars, it might motivate people to work on a specific issue and underestimating the others. (Giddings, B., Hopwood, B., O'Brien, G., 2002)

In order to measure sustainable development, there are several indicators that exist nowadays. They can be global, national or even local indicators to assess the progress on a particular subject. However, Kates, Parris and Leiserowitz (2005) have found that half of the existing indicators were mainly global. They have also discovered that the indicators were very influenced by the stakeholder that was in charge of creating it. Furthermore, the more inclusive stakeholders want to be, the broader are the scopes of the indicators. Also, the time period of these indicators isn't quite explicit despite the specificity of "intergenerational equity". (Kates, R. W., Parris, T. M., Leiserowitz, A. A., 2005) Although it is often used, the growth of the Gross Domestic Product doesn't evaluate accurately sustainability. Meanwhile, Boulanger (2004) affirms that the most complete and accepted indicator is the HDI (Human Development Index). (Boulanger, P. M., 2004) Vilalta-Perdomo, Michel-Villarreal and Corliss (2017) suggest to "The 17 Sustainable Development Goals" as well as their targets to check if the goals of the three dimensions of sustainable development are reached. (Vilalta-Perdomo, E., Michel-Villarreal, R., Corliss, J., 2017)

It should be noticed that goals of sustainable development have been set in numerous institutions at all scales. For instance, it has become essential for the United Nations and has led to the creation of the "Division of Sustainable Development", the involvement of a vice president in charge of sustainable development at the World Bank as well as the "declaration of the UN Decade of Education for Sustainable Development". (Kates, R. W., Parris, T. M., Leiserowitz, A. A., 2005) Nevertheless, even if sustainable development isn't at the center of the debates, its challenges will force it overtime. (Hopwood, B., Mellor, M., O'Brien, G., 2005)

Lastly, it is important to say that sustainable development implies compromises. Indeed, the economic, social and environmental pillars are, in fact, inseparable so sustainable development consists mostly in meeting the different objectives of the different stakeholders. It doesn't put anyone out of the negotiations since both wealthy and poor countries are involved in the process. (Kates, R. W., Parris, T. M., Leiserowitz, A. A., 2005) Since environmental issues are worldwide, it makes sense to involve everyone in the conversation. The environmental problems aren't local and, as a result, solutions have to be found collectively in order to avoid an issue to simply change location. (Hopwood, B., Mellor, M., O'Brien, G., 2005) In other words, sustainable development is the synthesis of the different visions for a collective action in order to "meet basic needs without destroying or irrevocably degrading the natural systems on which we all depend." (Kates, R. W., Parris, T. M., Leiserowitz, A. A., 2005)

CIRCULAR ECONOMY

As eco-design implies the idea of a circular motion of creation, circular economy seems to be indispensable for the understanding of the concept of eco-design and what theories it relies on. Here, circular economy will be developed especially linked to sustainable development as it is the main topic involved.

How is circular economy relating to sustainability? Geissdoerfer, Savaget, Bocken and Hultink (2017) have studied the relation between these two notions, both for the similarities and the differences. (Geissdoerfer, M., Savaget, P., Bocken, N. M., Hultink, E. J., 2017)

Let's begin with the similarities. Firstly, there is the fact that both concepts require an engagement from several generations which are motivated by the environment as well as the participation of governments and institutions to create a way. As a result, they both understand that there is a need for a global action with shared obligations and a need for cooperation. Secondly, sustainability and circular economy both require "multi- or interdisciplinary approaches" in order to reach an overall goal motivated by innovation and to meet the need for diversity in order to have different opportunities. Lastly, both of the concepts increase the importance for changes in the business models of companies in order to facilitate the "socio-technical transitions". (Geissdoerfer, M., Savaget, P., Bocken, N. M., Hultink, E. J., 2017)

But what are the differences? Firstly, they have not emerged at the same time since sustainability is a lot older than circular economy. Furthermore, circular economy aims to create a "closed loop" while sustainability has more of an "open-ended" idea. Thirdly, they have different ambitions as sustainability is based on the past and tends to be adaptable to different situations and circular economy looks mainly at the use of resources and how they could be used better. In addition to that, sustainability aims at the

environment, people and society but circular economy is mainly focused on the "economic actors". Also, sustainability diffuses the agency through the different stakeholders in comparison with circular economy which stresses the importance of the States. (Geissdoerfer, M., Savaget, P., Bocken, N. M., Hultink, E. J., 2017)

As Michelini, Moraes, Cunha, Costa and Ometto (2017) explained, the current economic system that we are in is mainly linear, which means that the firms produce products or services that the consumer uses and that's it. Only "virgin material" is used in the process. (Michelini, G., Moraes, R. N., Cunha, R. N., Costa, J. M., Ometto, A. R., 2017) This model finds its origin in the 17th century, back during the industrial revolution which completely disregarded the environment and potential harm that could be done to it. (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018) Such way of working has impacts such as "unnecessary resource losses, production chain and end-of-life waste, excessive energy use and erosion of ecosystems" (Michelini, G., Moraes, R. N., Cunha, R. N., Costa, J. M., Ometto, A. R., 2017). As a result, the European Union has set goals for 2020 which consists in a better use of the existing resources and a transition to a circular economy. (Michelini, G., Moraes, R. N., Cunha, R. N., Costa, J. M., Ometto, A. R., 2017)

How have we come up with the circular economy?

Prieto-Sandoval, Jaca and Ormazabal (2018) claim that there are three different stages that led to it. As said previously, there were a linear economy that came up with the Industrial Revolution. It slowed down in the 60s since it is when the environmental concerns began to rise up. The second stage was the industrial ecology which marked the beginning for ecological movements by integrating different actors through a reuse of their wastes. Even if it is claimed to be a green economy, so an economy that has among its goals the improvement of well-being and equity for humans while taking into account the environment, the industrial economy was the source of relatively few actions due to the huge importance that it was still giving to the economy rather than human and natural capital. The last stage, which began in the 90s, is the circular economy itself which aimed to take more into account the environment by implying a circular motion for firms. In such way, the economic growth isn't set on the side but is rather seen as sustainable and environmentally friendly. (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018) In comparison with linear economy, circular economy has principles such as "preserve and enhance the natural capital, optimize resource yields and foster system effectiveness" (Michelini, G., Moraes, R. N., Cunha, R. N., Costa, J. M., Ometto, A. R., 2017). As a result, it brings news ideas such as the reuse of materials and energy or wastes reduction. (Michelini, G., Moraes, R. N., Cunha, R. N., Costa, J. M., Ometto, A. R., 2017)

Prieto-Sandoval, Jaca and Ormazabal (2018) define, after a broad research on the different existing definitions, the circular economy as following : "an economic system that represents a change of paradigm in the way that human society is interrelated with

nature and aims to prevent the depletion of resources, close energy and materials loops, and facilitate sustainable development through its implementation at the micro (enterprises and consumers), meso (economic agents integrated in symbiosis) and macro (city, regions and governments) levels, (… and) requires cyclical and regenerative environmental innovations in the way society legislates, produces and consumes" (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018). As it can be seen, circular economy implies a

Source: Prieto-Sandoval, V., Jaca, C., & Ormazabal, M. (2018). Towards a consensus on the circular economy. *Journal of Cleaner Production*, *179*, 605-615.

circular motion that starts with the extraction of resources from the environment which is being following by their transformation to be distributed and used by consumers later on. However, its specificity is that after the use, there is a recovery process, that goes either through the environment or the industrial processing, which closes the loop and allows the circle to keep going. In order to install a circular economy, four components are necessary: "1. the recirculation of resources and energy, the minimization of resources demand, and the recovery of value from waste; 2) a multi-level approach; 3) its importance as a path to achieve sustainable development; 4. its close relationship with the way society innovates". (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018)
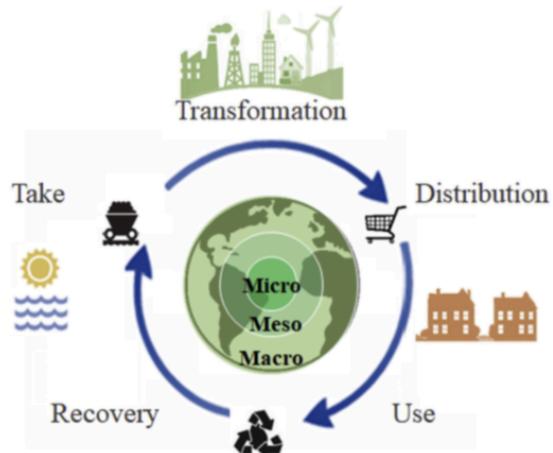
As in the definition of Prieto-Sandoval, Jaca and Ormazabal (2018), there are three levels of "research and implementation: micro, meso and macro" (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018). First, there is the micro level which is mainly focused on the company itself and how it can improve its processes. Secondly, the meso level "includes the companies which belong to an industrial symbiosis that will benefit not only the regional economy but also the natural environment" (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018). Lastly, there's the macro level and it takes a look at a bigger picture such as cities or regions, which is why it is at this specific level that the policies are elaborated. (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018)

The principles that were the most associated to circular economy were the 3Rs as in reduce, reuse and recycle (or the 4Rs with "recover") which consist in reducing the overall consumption, produce fewer emissions as well as maximize the efficiency. There are also the sustainable design strategies (SDS) known as eco-design (cfr. p.19), the

Source: Prieto-Sandoval, V., Jaca, C., & Ormazabal, M. (2018). Towards a consensus on the circular economy. *Journal of Cleaner Production*, *179*, 605-615.

nature-inspired design strategies and the cradle-to-cradle tenets ("waste equals food, use current solar income, celebrate diversity") even if eco-design is the one covering the most parameters related to the products/services. Even if there are these multiple principles, they can all be used together as long as it is at the right moment in the process. Indeed, SDS help for the designing while the 3Rs are applied throughout the cycles of "production, consumption and return to resources" (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018)

What's the point for companies in turning circular?

Not only does it prolong the life of their products/services, it also maximizes their use as well as allows the company to be more cost and material efficient or even reuse certain parts of their production. (Michelini, G., Moraes, R. N., Cunha, R. N., Costa, J. M., Ometto, A. R., 2017)

De Jesus and Mendonça (2018) have studied the drivers and barriers to go for a circular economy. They separated both of these between soft and hard ones. (De Jesus, A., Mendonça, S., 2018)

Factors facilitating and constraining the transition towards a CE.

	Drivers	Barriers
Technical and economic factors	Hard drivers	Hard barriers
Institutional and social factors	Soft drivers	Soft barriers

Source : De Jesus, A., & Mendonça, S. (2018). Lost in transition? Drivers and barriers in the eco-innovation road to the circular economy. *Ecological Economics*, *145*, 75-89.

As it can be seen, what is considered as "hard" are the "technical and economic factors" due to the fact that they can force change (e.g. research and development, processes) while what is "soft" are the "institutional and social factors" since they mainly influence changes thanks to practices to attract and infuse values or behaviours. However, as explained earlier, the State and the firms have to work at the same time, which means that soft and hard factors don't exclude each other and, rather, go hand in hand. (De Jesus, A., Mendonça, S., 2018)

What are the different barriers and the drivers for circular economy? They are mainly related to cost management, investments, infrastructure, interactions between companies as well as the positive or negative response from the consumers. In addition to that, a lack of sufficient government or institutional support is also a factor that can stimulate or hinder the implementation of a circular economy. (De Jesus, A., Mendonça, S., 2018)

		Drivers	Barriers
"Harder" factors	Technical	Availability of technologies that facilitate resource optimisation, re-manufacturing and re-generation of by-products as input to other processes, development of sharing solutions with superior consumer experience and convenience	Inappropriate technology, lag between design and diffusion, lack of technical support and training
	Economic/Financial/ Market	Related to demand-side trends (rising resource demand and consequent pressures resource depletion) and supply-side trends (resource cost increases and volatility, leading to incentives towards solutions for cost reduction and stability)	Large capital requirements, significant transaction costs, high initial costs, asymmetric information, uncertain return and profit
"Softer" factors	Institutional/ Regulatory	Associated with increasing environmental legislation, environmental standards and waste management directives	Misaligned incentives, lacking of a conducive legal system, deficient institutional framework
	Social/Cultural	Connected to social awareness, environmental literacy and shifting consumer preferences (e.g. from ownership of assets to services models)	Rigidity of consumer behaviour and businesses routines

Source : De Jesus, A., & Mendonça, S. (2018). Lost in transition? Drivers and barriers in the eco-innovation road to the circular economy. *Ecological Economics*, *145*, 75-89.

Let's go more into details, starting with the hard factors and then moving on to the soft factors.

For the hard drivers and barriers, let's begin with the technical factors. This factor is essential as it defines the life duration and the quality of the products as well as how efficient they will end up being. It is often linked to the rise of a new technology. For instance, it determines if a material has the ability to be recycled and could offer more technological solutions or if it could be used for other processes. However, this could be taken as a barrier since the lack of specialization or the technological gaps. (De Jesus, A., Mendonça, S., 2018)

There are also the economic, financial and market factors. As said previously, these contain barriers as well as drivers. Surely, the need for growth and higher revenues will stimulate firms so that they will look for new ways to obtain results and find other opportunities. But it could also lead to resistance since, for instance, the companies would fear to fail or would be less likely to invest more for a project that they know less about. (De Jesus, A., Mendonça, S., 2018)

Let's move on to the soft drivers and barriers, beginning with the institutional and regulatory factors. It is common knowledge that the government can, through measures such as laws or incentives, provide guidance when it comes to market failures or create an environment keen to changes. However, it can also be very dangerous when the different decisions that are taken are not well aligned with each others or complicate the current situation. (De Jesus, A., Mendonça, S., 2018)

Lastly, there are the social and cultural factors. It includes awareness related to

the environment, customer preferences and also their vision of the business. These factors are extremely important since they can influence tremendously if people are ready and want sustainable options. However, it can be a barrier since people are getting aware too slowly about the damages done on the environment as well as the different options that they might have. (De Jesus, A., Mendonça, S., 2018)

To conclude, De Jesus and Mendonça (2018) have declared that the soft factors were mainly driving the outcome for the circular economy, even though the hard factors are still quite important. (De Jesus, A., Mendonça, S., 2018)

ECO-INNOVATION

Circular economy requires eco-innovations in order to understand the complete lifecycle of products/services and reduce wastes while guaranteeing quality. (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018)

Eco-innovation can be explained as "the production, application or exploitation of a good, service, production process, organizational structure, or management or business method that is novel to the firm or user and which results, throughout its lifecycle, in a reduction of environmental risk, pollution and the negative impacts of resource use (including energy use) compared to relevant alternatives". (Kemp, R., & Pearson, P., 2007) However, it must not be forgotten that such change will require efforts both from the firms and the State while keeping in mind that the goal is to meet the needs of the society. (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018)

Prieto-Sandoval, Jaca and Ormazabal (2018) have noticed that there are four types of eco-innovations: exploitative, restorative, cyclical and regenerative. (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018)

There is a difference between the first two and the last two. Indeed, the exploitative and restorative manner refers to an "anthropocentric sociological of the world" since they mainly care about human needs, caring less about the environment. Actually, exploitative eco-innovations manage to be cost efficient and respect the legal necessities while the restorative eco-innovations will look for solutions for what has been done, which translates for both little interest for the environment but yet making a slight effort. Meanwhile, the cyclical and regenerative eco-innovations are considered as "eco-centric sociological" which puts humans as a part of the world but not its holders. The cyclical eco-innovations "connect humans and nature with the ecosystem to a higher degree and improve the capacity to close the loops" while the regenerative eco-innovations "are very closely related to the ecosystems' ability to create added value for humans and nature". (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018)

In order to be even more precise, Prieto-Sandoval, Jaca and Ormazabal (2018) suggest a categorization of eight sorts of eco-innovations: 1. "business model innovations" which are about the overall manner that companies will deliver value; 2. "network innovations" which will depend on how the companies work with others; 3. "organizational structure innovations" which focuses on the procedures and methods that are used; 4. "process innovations" which are all about the way that the firms are producing their products or deliver their services; 5. "product innovations" which consist in all the specificities of the products related to quality and performance; 6. "service innovations" which consist in trying to "increase the use of a product by decreasing its ownership" and will result in sharing one product with others, hence lowering resource consumption; 7. "market innovations" which are mainly attained through the communication channels of the firm with its customers as well as the image that it broadcasts; 8. "customer engagement innovations" which is all about the customers' needs and previous participations.

There are three determinants to eco-innovation known as "the regulation and policy, the supply side and the demand side" (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018).

Firstly, it is undeniable that regulations help to influence behaviours both of firms and consumers, hence help with the implementation of a circular economy, through different means such as incentives or awareness campaigns.

Secondly, "technological capabilities, cost savings from efficient production, market structure and organizational innovations" are considered as supply side determinants (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018). Indeed, firms have the power to manage their resources use by maximizing their use and reducing their waste, while still attaining the needs of the consumers. This determinant has three characteristics: "geographical proximity, the affinity of company management to work in an interconnected manner and the market system" (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018). Geography has a major role since it plays a role in the transportation of resources as well as how they will be shared. As for the interconnection capacity, it can help firms to make changes and manage the challenges as well as improving their knowledge. Also, the market cannot be forgotten because circular economy needs to be profitable for companies, so to make changes while remaining competitive. (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018)

Lastly, the demand side is very important because the consumers have a major role in the economy since their needs have to be met while taking into account their preferences related to sustainability, which will define the success of a change. As for sustainability, it has been proven that the way that consumers perceive it is extremely valuable. (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018)

These determinants are connected to each other. Indeed, the policies and laws will influence and create a framework for companies and consumers. Firms have influences on the markets and the consumers decide about the outcomes of the transitions. (Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018)

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WHAT ROLE FOR DESIGN?

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Andrews, Morad, Wade and Vickery (2015) affirm that the role of a designer is to take the needs of the society into account in order to create products and services that make sense technically and economically. Even though they are the ones who brought up the planned obsolescence, they must now take another approach by looking at the social, economic and environmental issues which would lead them to have a holistic approach towards needs. To have sustainable practices, they suggest that education should be a major tool in order to impact the behaviours and design thinking. (Andrews, D., Morad, M., Wade, R., Vickery, L., 2015)

De los Rios and Charnley (2017) linked the concept of design to the circular economy. According to them, designers are at the center of this model because of their capabilities and growing influence on the elaboration of projects. Furthermore, they say that they potentially have the power to influence the consumers' perception of sustainability in order to create a model that is benefiting both the firms and the society as a whole. Indeed, design isn't just about aesthetics but it is about an entire process. Usually, it is shown through strategies such as "eco-design" (cfr. p.19), "design for the environment" or "sustainable design". (De los Rios, I. C., Charnley, F. J., 2017)

In order to act for the environment, their study has highlighted the Lifecycle Assessment (LCA) tools because it provides, both for the producer and the designer, a common ground in order to check the costs of a product throughout its life as well as to make the best decisions related to eco-friendly materials. (De los Rios, I. C., Charnley, F. J., 2017)

The authors also suggest the use of the Circularity Indicators Methodology. It supports, again both the designers and the company, in their assessment of "how well a product performs in the context of a circular economy allowing companies to estimate how advanced they are on their journey from linear to circular" (De los Rios, I. C., Charnley, F. J., 2017).

However, there is a need for designers to realize that they should do more about the intangible elements such as the acceptance of the change for consumers as well as how they perceive sustainability instead of solely focusing on the technical features of a specific product. (De los Rios, I. C., Charnley, F. J., 2017)

In their study, they have shown that depending on the strategy of a firm, they will pay more or less attention to intangible notions. For instance, if their strategy is mainly aiming to be sufficient, they will pay more attention to intangible value, while if they are focused on "efficiency", they will tend to focus on the technical aspects and less on the customer value. (De los Rios, I. C., Charnley, F. J., 2017)

DESIGN THINKING

While Design Thinking could have been placed alongside the explanation of design and innovation, the choice has been rather to put it here in order to make links with sustainable development. However, as a disclaimer, it has to be clear that sustainability isn't always included in Design Thinking. Indeed, sustainability is included in the process only if the users choose to do so. (Shapira, H., Ketchie, A., Nehe, M., 2017)

Brown (2009) (as cited in Andrews, D., Morad, M., Wade, R., Vickery, L., 2015) defines Design Thinking as "the collaborative process by which the designer's sensibilities and methods are employed to match people's needs with what is technically feasible and a viable business strategy. In short, design thinking converts needs into demand" (Brown, T., 2009 qtd. as cited in Andrews, D., Morad, M., Wade, R., Vickery, L., 2015) It is very suitable for "uncertain and complex situations". (Glen, R., Suciu, C., Baughn, C. C., Anson, R., 2015)

But what are the stages of Design Thinking?

Brown and Katz (2011) call them the "three spaces of innovations" which are "inspiration", "ideation" and "implementation" (Brown, T., Katz, B., 2011). The first step is about finding the reason, what would lead to the exploration for solutions. The following step is the development phase where different concepts will be created and tested. Lastly, it's the concrete phase where the right concept is chosen and set up in order to transform a project to reality. According to the authors, these steps of Design Thinking should be spread in the companies and also close to the top since it's mainly where the decisions are made. (Brown, T., Katz, B., 2011)

IDEO (2012) (as cited in Shapira, H., Ketchie, A., Nehe, M., 2017) go further by dividing Design Thinking into five stages: "discovery", "interpretation", "ideation", "experimentation" and "evolution". (IDEO, 2012 qtd. as cited in Shapira, H., Ketchie, A., Nehe, M., 2017)

Firstly, there is the Discovery phase. As in the inspiration phase explained previously, it is all about finding the different challenges that could lead to the potential elaboration of a problem-solving process. This means that the designers will check
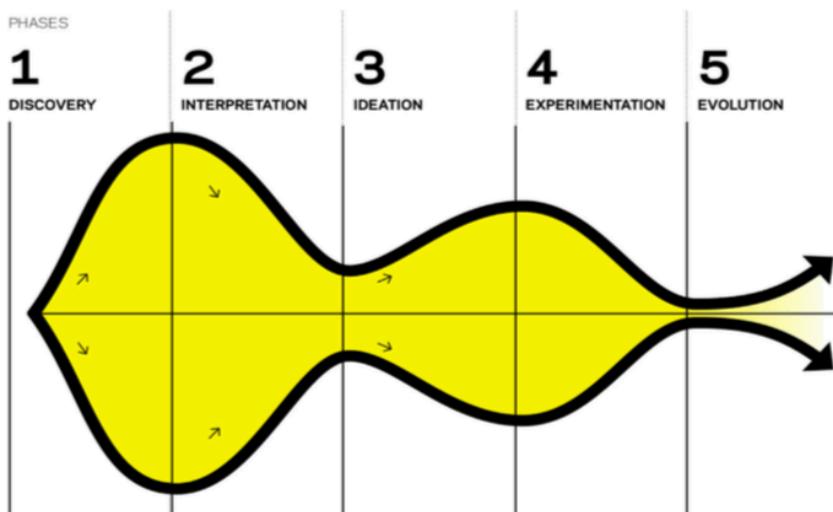
several issues which will lead to the following stage, the Interpretation, where the designers will gather to check and choose what should be focused on. (IDEO, 2012 qtd. as cited in Shapira, H., Ketchie, A., Nehe, M., 2017)

Next, there is the Ideation phase which consists in thinking about all the ways that designers could solve the problem that they chose. Afterwards, in the Experimentation phrase, they would all gather around to choose the specific ways that the team agrees on trying and developing. (IDEO, 2012 qtd. as cited in Shapira, H., Ketchie, A., Nehe, M., 2017)

Last but not least, there is the Evolution step which is the concrete way and strategy that the designers will implement in order to reach their goal. (IDEO, 2012 qtd. as cited in Shapira, H., Ketchie, A., Nehe, M., 2017)

According to Glen, Suciu, Baughn and Anson (2015), there are five core characteristics to Design Thinking. (Glen, R., Suciu, C., Baughn, C. C., Anson, R., 2015) I will combine it with Shapira, Ketchie and Nehe's work (2017) which also tackled the different characteristics and added one of them. (Shapira, H., Ketchie, A., Nehe, M., 2017)

Firstly, the Design Thinking process is "human-centered". Indeed, it starts with the users and its environment. It will analyze humans continuously and push the designer to forget about his assumptions by being open-minded and letting what he sees define what problematic will be tackled. As a result, there would be a real connection between people and the designers. (Glen, R., Suciu, C., Baughn, C. C., Anson, R., 2015) Shapira, Ketchie and Nehe (2017) agree with this notion because the stages prove that the humans are put in the centre of the process instead of the product or the service. (Shapira, H., Ketchie, A., Nehe, M., 2017)

Secondly, there needs to be "observations". By analyzing others that way, it allows to understand the users' "experience, abilities and constraints" without influencing

it. Therefore, the observation will lead to a vision on multiple levels, such as "physical, emotional, cognitive and cultural" (Glen, R., Suciu, C., Baughn, C. C., Anson, R., 2015). Shapira, Ketchie and Nehe (2017) prefer speaking about "research-based" and justify by saying that it helps better understand "humans' needs, drivers and barriers" (Shapira, H., Ketchie, A., Nehe, M., 2017).

In addition to that, it's important to have "visualization". This allows to have a global vision of all the different pieces of information in order to make connections and conclusions based on that. Consequently, it combines intuition but also logic. (Glen, R., Suciu, C., Baughn, C. C., Anson, R., 2015) In comparison, Shapira, Ketchie and Nehe (2017) name this characteristic "knowing the surrounding context" because we can have an overall view of the context. (Shapira, H., Ketchie, A., Nehe, M., 2017)

The fourth characteristic is "prototyping". It consists in representing the ideas so that it can be judged and help move forward. It shouldn't be expensive or slow to be made as it should be easy to move on from or modify. (Glen, R., Suciu, C., Baughn, C. C., Anson, R., 2015) This is linked to the "non-linearity and experimentation" aspect of Shapira, Ketchie and Nehe (2017) because it implies various research and evaluations. (Shapira, H., Ketchie, A., Nehe, M., 2017)

The fifth aspect that Glen, Suciu, Baughn and Anson (2015) have developed is "experimentation and active learning". It implies an exchange in order for the project to make sense. They both require reflection on what has been done. It should help to have better results on the long run. (Glen, R., Suciu, C., Baughn, C. C., Anson, R., 2015) I would link this characteristic to two of these from Shapira, Ketchie and Nehe (2017) known as "collaboration" and "non-linearity and experimentation" because these aspects tackle both the need for the inclusion of others through exchanges as well as reflection.

Lastly, I'd like to evoke the characteristic of Shapira, Ketchie and Nehe (2017) that could not be linked to the ones of Glen, Suciu, Baughn and Anson (2015). It is the notion of "optimism". By that, the authors meant that Design Thinking relies on the belief that change can come from anyone and that design doesn't exclude based on any factor. (Shapira, H., Ketchie, A., Nehe, M., 2017)

As we can understand, in order for Design Thinking to make sense, the designers should start off with the real world by going out and examine how people really go through life. "An intensive period of observation" is required to create something that is in phase with the society. The objective of Design Thinking should be to "translate observations into insights, insights into products and services that will improve lives" (Brown, T., Katz, B., 2011). As a result, there would be a shift from working for or against others to working with others. (Brown, T., Katz, B., 2011)

To conclude, I will develop how and why Design Thinking could be related to sustainable development.

As said previously, Design Thinking is a human-centered. In addition to having all the different steps that I have developed, it has "Three Lenses of Human-Centered Design" which helps explaining the priorities of Design Thinking, known as "desirability", "viability" and "feasibility". As a result, the perfect Design Thinking lies in the intersection of these three notions. (Shapira, H., Ketchie, A., Nehe, M., 2017)

If we want to link it to sustainable development, in order to create the "Propelling Human-Centered Design", there is a need to put sustainability in the center to have a sustainable result. In other words, in addition to answering the needs, sustainability's matters should be checked at the same time. In order to do so, a pre-phase will be needed to make sure that the designing team fully understands sustainability before they get even started so that everyone has "the basic knowledge in order to be functional but not overwhelmed" (Shapira, H., Ketchie, A., Nehe, M., 2017). It also allows to have the same understanding on the topic of sustainable development. Nevertheless, it's also important to keep sustainability in mind during feedback in order to gather the different perceptions on the matter. (Shapira, H., Ketchie, A., Nehe, M., 2017)

As a result, sustainability principles would act as "creative constraints to shape the design process" (Shapira, H., Ketchie, A., Nehe, M., 2017). The reason why sustainability could be related to Design Thinking is that design performs great, or even better, when it has to deal with constraints because it pushes to take certain aspects into consideration and make it logical to include them in the process, such as the sustainable development in our case. Furthermore, sustainability can also be seen as an opportunity as it fuels innovation since it motivates to look for new ways or ideas. Lastly, if we look at it the other way around, Design Thinking would be a great way to solve the sustainability challenges since it looks at all kinds of disciplines as well as does observations and experimentations based on the real world. (Shapira, H., Ketchie, A., Nehe, M., 2017)

However, as a limit, it has to be stressed that some don't completely agree with the inclusion of the Sustainability Principles in the Human-Centered Design because they fear that it wouldn't bring enough optimism on the table. In addition to that, others would argue that the Sustainability Principles aren't enough of a constraint due to its "minimal

Source: Shapira, H., Ketchie, A., & Nehe, M. (2017). The integration of design thinking and strategic sustainable development. *Journal of Cleaner Production*, *140*, 277-287

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requirements" which are also "too abstract" (Shapira, H., Ketchie, A., Nehe, M., 2017).

After this global analysis of interior design and consumers as well as the concepts that are vital to their understanding, I came up with the following question:

"What are the <u>limiting factors</u> for the development of <u>eco-design</u> in <u>interior design</u>?"

In order to introduce this section of the work, I will sum up all the information that we have learned, which will allow me to set hypotheses that will be tackled in the interviews with two different interior designers and a sociologist as well as in the survey for consumers. As a consequence, it will allow a better understanding of the research question that I will attempt to develop an answer for.

In the case of this thesis, the choice has been made to make interviews as well as a survey, each of them having a specific purpose.

In order to fully understand the stakes of the profession that is interior designer, as well as in the case of the sociologist who can give insights about consumers, it seemed to make sense to make interviews so that people can give details thanks to open questions. The interview guide that has been made and will be used in this case will be based on the previous theoretical information that has been developed. Indeed, the concepts and the themes have been tackled previously in the work and are what is leading the interior designers to express themselves on these subjects. The goal is to confirm or not what has been explained. All these interviews will be made in Brussels and take place during the months of May and June.

As far as the interviews are concerned, I will first develop the aspects that have been explained with Alexandre Auquier, who has been active in interior design for a long time and who will allow us to have an overall view since he works both on independent projects as well as corporate projects. Then, I will move on to Nicolas de Nys, another interior designer who will help us to have a recent vision of the market. To finish up, I will develop the interview that I had with Pierre Echard, a sociologist who is also teaching at ESA Saint-Luc and who will help us to have a closer look at eco-design in the case of interior design. As their interviews were made in French, I will make sure to include their interview guide for a better understanding for non-French speakers.

On the opposite side, a survey will be done so that we can also have the opinions of consumers. The choice of the survey has been made because, since there were no specificities related to the customers that needed to be surveyed, it appeared to be better to have people from any background answering the questions. Nevertheless, the location of the people that will participate in the survey will be limited to Belgium so that it

matches the geographic constraint of the interviews. Thus, I will present the survey that I will have made to help us to check the affirmations related to customers and what they currently look for in the case of interior design but also their concerns for sustainable development.

PRESENTATION OF THE RESEARCH QUESTION

In the first section of the work, it has been seen that design and innovation have in common to be a process or a set of different practices that lead to the creation of something. This creation isn't linear and requires several disciplines in order to meet all the criteria. However, design is more than an innovation since it also implies answering to social demands, beyond the simple use or consumption of a product. As a result, my first hypothesis will be the definition that I have created: "Design is an innovation which allows to bring an added value to the users on an emotional dimension."

However, the research question being related to interior design, the analysis of the profession of an interior designer has a major importance. Thanks to a SWOT analysis, we had seen the different strengths, weaknesses, opportunities and threats. As its opportunities seem to be very interesting, the negative factors seemed to be major slowdowns for their development since they are in a bigger amount (four strengths and four opportunities against eight weaknesses and five threats).

The consumers were also studied since they play a major role in market changes. While notions such as values, needs, emotions and the development of green consumption have shown to be in favour for the better implementation of sustainable development, it has also been shown that eco-friendly products suffer from many barriers.

The last section of the theoretical part has been specifically related to sustainable development as eco-design is implied in this concept. Here, we could understand that, in order to meet the design's requirements, known as desirability, viability and feasibility, the sustainability principles had to be included throughout the process. Also, it helped to understand that eco-design relies on the idea of a circular way of creation in order to lower the impact on the environment.

As a result of all that has been explained previously, I have chosen to focus on this particular research question:

"What are the <u>limiting factors</u> for the development of <u>eco-design</u> in <u>interior design</u>?"

The reason why I chose to focus on eco-design is due to the fact that co-creation remains hard to do in interior design due to the little knowledge of consumers about design. Also, emerging technologies have stakes that don't take into account the beliefs

of users, or solely its experiences. According to what has been shown previously, it can be said that sustainability takes into account the rising concerns about the environment and has an impact on the behaviour of the users. Furthermore, sustainability doesn't exclude the use of the other opportunities. Indeed, in eco-design, new technologies are required to come up with new opportunities and alternatives and co-creation is implied through the expression of the different environmental concerns.

ALEXANDRE AUQUIER

Alexandre Auquier is the first person that has been interviewed for this work. His interview happened in Brussels, on the 23rd of May. It took place in person outside, in a public place.

The goal of this interview was to get more knowledge on the sector of interior design. Furthermore, Mr Auquier has been working in creative fields his whole life, which will help us to show precisely the link between creativity and design. Besides, thanks to his experience, he will allow us to see some evolution in the sector as well as the trends or what could potentially be beneficial for his work.

During his years in secondary school, he had already in interest for design since his studies were directed towards architecture. His goal was to make it easier for him to study this field at higher levels afterwards. (Auquier, A., 2018)

However, even though having followed classes of architecture at a very young age as I said, he began working in the fashion design. He first moved to Italy and then to France, in Paris more precisely. After studying at Studio Berçot, one of the most respected schools for fashion design, for about a year, he began working in haute couture. At the same time, he participated in multiple competitions related to that industry. For instance, he won the competition of Jean-Paul Gaultier which allowed him to finance a small collection that he could present before the show. He worked in fashion design until around his thirties. (Auquier, A., 2018)

As a result, after multiple years in the fashion industry, he ended up going back to architecture and interior design by studying at La Cambre, while still working in fashion but this time being related to cinema specialised in marketing. Thanks to the head of the workshops who was an architect, he had the opportunity to be really opened to several fields such as architecture, interior design or simply design. Therefore, even though he doesn't have any permit as an architect, he has all the notions related to it and is able to make the difference with interior design. Furthermore, he has worked on large corporate projects through Art&Build as well as smaller projects for his own purposes, which also allows us to have an overall vision of the work opportunities of an interior designer. Since 1989, he has been working as an independent which allows him flexibility. (Auquier, A., 2018)

I decided to interview Mr Auquier because he was the perfect example that a creative mind is essential in interior design. Also, he was a perfect fit to explain the concept of design, the differences with architecture, as well as the different factors that might affect an interior designer today.

INTERVIEW

Below, the interview guide that has been used for Mr Auquier's meeting is developed. I have separated the different concepts that I had chosen to tackle with him, each of them being divided into themes which will lead to the different questions that I will ask him.

However, before showing this specific interview guide, I will first explain why I have split it into the following concepts and themes.

I began by tackling interior design. The reason why is that it is the context of my research question. Hence, I must explain the basis on which I will develop my work. Firstly, I asked about Alexandre Auquier's experience in order to justify why he was being interviewed as well as his background. Afterwards, I have moved on to the problematic of this thesis as well as some factors that could affect it. I also linked interior design to consumers since, as said previously, they can have a major impact on an industry. Finally, I also tackled the two opportunities that are not cited in my research question in order to understand why these haven't been chosen for my research while yet explaining their potential role for interior designers. I finished up globalization, an aspect that has been tackled in the SWOT analysis and which, according to me, deserves to be tackled more precisely.

The next concept that I have asked about was sustainability. As it is very important for my research question, I needed to know more about the understanding of this notion for an interior designer as well as if it was no stranger to this specific market.

The third concept was ethics. Because I had not talked about it in the first part of this thesis, I wanted to make sure that, indeed, it was not what was impacting the outcome of my research question. Hence, I asked about ethics related to interior design but also related to its clients in order to have an overall view on the topic.

Lastly, I focused on eco-design, the core of this research paper. Firstly, I made sure that it was understood by interior designers and consumers. Afterwards, I went more into details by separating the different components that eco-design approaches, known as the energy, materials, water and health. To finish up, I made a final link with my research question as I asked about the limiting factors related to eco-design.

Now that everything has been justified and cleared up, let's have a look at the specific interview guide that I have used with Mr Auquier.

Concepts	Theme	Questions
Interior design	• Experience	• How long have you been an interior designer? • Could you explain your career? • Do you work as an independent or an employee?
	• Design	• How would you describe the word "design"? According to you, what are its main concepts? • Do you think that it has a link with innovation? Either way, why? • How would you define "added value"? • Do you think that the notion of "added value" is important in interior design? Either way, why? • How does interior design differ from other design sectors (such as architecture)? • What are the current main factors influencing the market? • Do mass production manufacturers as IKEA have a real impact on the interior design market? • Is there a movement to individualization?
	• Consumers	• Are there similarities between the consumers' demands that you have had? If so, which ones? • Could you describe the customer relationship management in the case of interior design? • How would you weight the customers' emotional dimension compared to the other dimensions (such as economic for instance)?

	• Co-design	• Are you interested in co-design? • Have you done it in the past or do you do this currently? • How would you explain it?
	• Emerging technologies	• Do you feel affected by emerging technologies? If so, which ones come to mind and why? • How did it affect you? • Have you been using specific programs to show your projects to your clients? If so, why and which one? Could you explain how do they work?
	• Globalization	• Do you feel that globalization has affected the market? Either way, why?
Sustainability	• Concept	• According to you, what is sustainability?
	• Interior design	• Is it a subject that is widely talked about in the market? • Could it be easily assimilated into interior design? Either way, why?
Ethics	• Interior design	• Do ethics have an importance for you? And in the global interior design market? For both questions, either way, why?
	• Consumers	• Do you think that ethics has taken more space in the consumers' minds? / Is ethics becoming central for them? Either way, why?
Eco-design	• Concept	• Are you aware of eco-design? If so, how would you describe it? • Do consumers have more concerns about the environment related to the interior design market?

• Energy	• What are the different practices that you use related to energy conservation? • Do you think that there is a wide range to choose from?
• Materials	• How do you feel about sustainable materials? • Do you think that there is a wide range to choose from?
• Water	• Are you aware of systems to conserve water? • Do you think that there is a wide range to choose from?
• Health	• What could be done in order to ensure the health of the consumers?
• Constraints	• Which constraints are there to switch for eco-design?

SUMMARY

This interview was extremely interesting as it gave me the opportunity to get to different subjects in more details. However, I decided to analyze it in a form of summary of the most useful answers for my research question.

Let's start with the profession of interior design.

Indeed, Alexandre Auquier confirmed that the lack of regulations was definitely a weakness for his work. According to him, it is a work that is not well understood by everyone due to the fact that there are no associations for interior designers. He makes the parallel with architects and doctors who benefit from an association, which can be restricting but which is also very useful in order to have a better view on the qualifications and the rules that apply to the worker. Indeed, anyone can be an interior designer as there are not rules to protect that profession or to explain the different subdivisions that there can be. For instance, he explains that an interior design isn't a decorator because an interior designer has to have an overall vision of the space and the furniture but he isn't specialized in furniture. According to him, an interior designer is like a conductor of orchestras because he doesn't have to know how to do the different jobs in the site but he

has to know all the knowledge related to it and make sure that everything goes as planned, hereby confirming that an interior designer has to deal with a lot of different disciplines. However, these two jobs are very often mixed which can lead to some misunderstanding for some clients. Concerning works that are related, he adds that it is very easy to go from interior designer to architect because both professions usually also do some work related to the other one. (Auquier, A., 2018)

The second aspect that is interesting to analyze is the problematic which tackles the subjects of design, innovation and added value and relates it to interior design.

Alexandre Auquier describes "design" as something that is depending on the time that we are settled in as well as the goal for its creation. He links it to his description of interior design by explaining that there are many factors to take into consideration and that it consists in providing the final entity which would meet all these distinctive requirements. As for the "innovation" concept, he stresses out the fact that, in most cases, an interior designer will tend to believe that he's an innovator even though his concept has been developed in the past. In his opinion, something becomes an innovation the moment that he makes sure to differentiate itself from the past through new technologies or practices. Regarding the "added value", he perceives it as being the synthesis of the vision of the client and his own vision and creativity in order to go beyond his satisfaction. (Auquier, A., 2018)

In order to analyze the factors affecting interior design, he decided to split it between big project and small projects.

For the big projects, he says that the number of people working together has a major impact. Also, big projects always imply to respect a concept that must be found throughout the entire space which requires lots of workforce. (Auquier, A., 2018)

As for the smaller projects, the project management is the most important notion for interior designers. Since they usually have to deal with tight budgets, a will for speed, it makes it difficult to deliver a project of quality. Furthermore, there are a lot more techniques that are used today which could mean more time needed but the agenda pressure doesn't follow. Besides, an interior designer has much difficulty due to the fact that he's quite dependent on the different people that work on the project, such as the plumber for instance. Lastly, he says that there's a tendency for dilutions of responsibility as firms tend to delegate more and more as well as calling a foreign workforce which doesn't master the language that they should be working in, which is a sign of the influence of globalization. Another aspect of globalization that he has tackled is that big interior design firms tend to expand considerably because they keep on getting acquired by bigger groups and so on. (Auquier, A., 2018)

As for mass manufacturers such as IKEA, Alexandre Auquier doesn't see it as a threat but rather as a provider for design education as well as a stimulator to make things more approachable for consumers. It educated people about design and helped to make it challenging in design which is a stimulator for growth. Lastly, it isn't because IKEA provides lots of products and services that consumers don't need independent interior designers as, due to his mass approach, most people seem to be lost in all of this so they still need some help to see it clearer. (Auquier, A., 2018)

Let's move on to co-design.

According to Mr Auquier, this concept has both positive and negative aspects. Again, the fact that people tend to know more is a really good thing because it pushes interior designers to go further. Also, it promotes the respects of others' perceptions and the idea that a mix of different peoples' ideas can help go further. However, it also means that people think that they know about the interior designer's work which could be dangerous because, even though they can a really good eye for aesthetics, they don't necessarily know what is the right fit for their project. Not only does the interior designer need sensitivity, he also needs to have an intellectual approach. Hence, it requires intuition and imagination but also rigor. (Auquier, A., 2018)

What about the emerging technologies?

Alexandre Auquier stresses their importance as they help to structure and deliver a more visual result to the client. It helps the interior designer to express himself. 3D and Virtual Reality allow to see things in volume which means that it is easier for him and the client to picture what they are talking about. (Auquier, A., 2018)

Now, let's consider the process that the customer goes through. Alexandre Auquier explains that there are two main steps in his work.

Firstly, there is the draft where he gets paid through a set price. The reason why it is done that way is because the client needs to understand that the draft already takes some work, yet he isn't forced to carry on with him afterwards if the project doesn't suit him. Once this step is completed and the client is satisfied with what has been proposed, there is the actual project step where he will get paid through a percentage but the price of the draft will be subtracted from the final price. (Auquier, A., 2018)

What about the design's dimensions, and most importantly, the desirability factor?

Alexandre Auquier explains that all the design's dimensions are mixed together. They should be taken into consideration at all times. However, the satisfaction of the client must be respected more than anything. Indeed, a non-respected budget can be more

easily dealt with than a final result that doesn't meet the demands of the client. (Auquier, A., 2018)

Let's finish up with sustainable development and eco-design.

For Alexandre Auquier, sustainable development is deeply connected to the circular economy. Also, it is a topic that is frequently involved in big interior design projects. However, it made things more complicated as it usually means that the project will be more expensive. According to him, the whole challenge is to make the client understand that, even though his project will cost more today, it will make it more profitable in the long run. (Auquier, A., 2018)

Concerning eco-design, he thinks that it is mostly related to the well-being of people rather than strong concerns for the environment. However, both notions luckily go hand in hand. (Auquier, A., 2018)

Regarding the energy, he evokes LED lamps due to their low consumption as well as home automation and energy management systems that can be modified from a far. He adds that, today, there are many ways to manage the energy which makes this topic far from being an outsiders' practice. It's the same for the materials: what once was hard to find or put into place, now is a lot easier to implement and there is sufficient number of sustainable materials to choose from. As for the water management, he didn't into much detail but affirms that there are several incentives not to waste water. Lastly, concerning the health, he thinks that ventilation is a big topic that is often not regarded in homes. According to him, this aspect is studied solely depending on the clients' demands. (Auquier, A., 2018)

As for the limiting factors for eco-design, Alexandre Auquier's opinion is that there is a big number of constraints. Even though it is now harder to have a permit to build due to all the requirements that the project has to meet, there is still not enough support from the State because laws tend to influence consumers' behaviours. In addition to that, education plays a major role. Again, even though it is better now than before, there is still a need to educate the young generation about the different ways to care and implement sustainable practices. Besides, he thinks that the promotion of sustainable alternatives as well as their amount isn't sufficient compared to non-sustainable options. Also, these sustainable alternatives can sometimes be harder to implement, which leads customers to go back to traditional options. On top of that, the price can deter most consumers as they are more expensive than the rest of the market even though it tends to go down. (Auquier, A., 2018)

Nicolas De Nys was the second interior designer that has been interviewed in the case of this work. His interview happened in Brussels, on the 22nd of June. It took place in person outside, in a public place.

It was interesting to interview Mr De Nys because, due to his few years of experiences, he was the perfect person to ask about current trends and what is affecting the industry today since he wouldn't be influenced by what he could have done in the past or his experiences that could be related to past movements in interior design. Furthermore, thanks to his daily use of emerging technologies, he is completely up-to-date about this opportunity as well as aware of what could be developed or implemented linked to sustainable development. As a result, it is clear that the main goal of this interview was to focus on interior design as it is today as well as what could be promising.

Nicolas de Nys has always considered himself as having a creative spirit. After taking a gap year abroad, he entered ESA Saint-Luc to study interior design which lasted for three years. He explained that the first two years were mainly about managing the space and that the last year was about creating concepts and creating a story that is coherent for interiors. Instead of going further with a master, he went on to do an internship in scenography and even made the runway for Mont-Clerc in Milano and an exposition for AD Collections in Paris. Now, he works as an independent but for an interior design company called Attilio Perelli. Their main concept is to create interiors that adapt to the client instead of the opposite which is more common in the industry. More specifically, he is in charge of the maps and 3D works. (De Nys, N., 2018)

INTERVIEW

The interview guide that I have used with Nicolas de Nys is the same as the one that I have used for Alexandre Auquier except that I have shortened it for reasons such as his still short work experience in the interior design field as well as schedule constraints. I have chosen to still put it here as a wish for transparency, in order to avoid any misunderstanding as well as to see the links with what will be developed in the analysis.

I began to ask him about his experience as an interior designer in order to justify my motivations for interrogating him.

Afterwards, I asked him about my problematic through questions requesting him to explain design, innovation and added value as well as how added value was perceived in the case of interior design more specifically. I also asked him about some aspects of the SWOT which were about mass manufacturers and individualization.

Then, I moved on to the consumers' part by asking him if he could identify patterns in what he has been asked to do so far as well as the importance of one of design's dimensions, desirability which bases itself on the emotions of the user, compared to the two other dimensions.

I also spoke about emerging technologies since he was the most suitable person to ask about it. Regarding this aspect, I asked him about what he was working with in his work as well as its potential use to portray his projects to his clients.

To finish up, I tackled sustainable development and eco-design. Firstly, I asked about his understanding of these concepts. Later on, I became more specific by asking about the different components developed in eco-design known as energy, materials, water and health. I made a final link with my research question by asking him about the limiting factors that he thinks that there are for eco-design.

Concepts	Theme	Questions
Interior design	• Experience	• How long have you been an interior designer? • Do you work as an independent or an employee?
	• Design	• How would you describe the word "design"? According to you, what are its main concepts? • Do you think that it has a link with innovation? Either way, why? • How would you define "added value"? • Do you think that the notion of "added value" is important in interior design? Either way, why? • How does interior design differ from other design sectors (such as architecture)? • Do mass production manufacturers as IKEA have a real impact on the interior design market? • Is there a movement to individualization?

	• Consumers	• Are there similarities between the consumers' demands that you have had? If so, which ones? • How would you weight the customers' emotional dimension compared to the other dimensions (such as economic for instance)?
	• Emerging technologies	• Do you feel affected by emerging technologies? If so, which ones come to mind and why? • Have you been using specific programs to show your projects to your clients? If so, why and which one? Could you explain how do they work?
Sustainability	• Concept	• According to you, what is sustainability?
Eco-design	• Concept	• Are you aware of eco-design? If so, how would you describe it? • Do consumers have more concerns about the environment related to the interior design market?
	• Energy	• What are the different practices that you use related to energy conservation? • Do you think that there is a wide range to choose from?
	• Materials	• How do you feel about sustainable materials? • Do you think that there is a wide range to choose from?
	• Water	• Are you aware of systems to conserve water? • Do you think that there is a wide range to choose from?
	• Health	• What could be done in order to ensure the health of the consumers?

• Constraints	• Which constraints are there to switch for eco-design?

SUMMARY

Let's focus on the problematic first.

To explain design, Nicolas de Nys compares design as being a line that has to be respected. This line represents the story, the concept of the entity that is being created. Design is the explanation of why an entity is created. (De Nys, N., 2018)

It relates to innovation because they both require research even though they can both start from something that is already existing. As a result, the whole point for both of these concepts is to break away from previous realizations by transforming it through various new means. (De Nys, N., 2018)

As for the added value, Nicolas de Nys considers that it is a combination of differentiation and satisfaction of the client. The client must like what has been done but should also be able to recognize himself in his interior in order to let place for his own universe translated in his space. The added value of an interior designer, hence, is the creativity that helps him to bring his customer further than his own imagination. (De Nys, N., 2018)

As Alexandre Auquier, Mr De Nys thinks that interior design goes hand in hand with architecture. However, he notices the difficulty for architects to collaborate with interior designers due to the differences between their studies. (De Nys, N., 2018)

What about the influence of mass manufacturers? Again, as Alexandre Auquier, he doesn't see it as a threat. Although they might influence the prices, their customers are people looking for common design while interior designers usually approach clients that look for individual concepts which require more researches. According to him, online platforms are more of a threat because they influence the brainstorming process. Even though it can help to open up our minds, it can also influence us in such a way to recreate something that has already been done. (De Nys, N., 2018)

Concerning the three design's pillars, Nicolas de Nys also validates that the satisfaction of the client is the number one priority for an interior designer. Indeed, budgets are often not respected which makes it less determining. However, budget can be a major restrictor for creativity. As a result, each pillar can act on each other by restraining them. (De Nys, N., 2018)

As for emerging technologies, Mr de Nys explains the opportunity of Virtual Reality in order to show the projects for a client. Thanks to 3D views made with a program such as SketchUp, he can put his smartphone in a head-mounted display which will allow to change scene thanks to a button. Such practices help to push the client in the right direction, causing an "impulse buying". However, he stresses that interior designers first learn to work with 2D and then learn the 3D. According to him, SketchUp has helped considerably interior designers to hand in projects in the shortest amount of time while other programs can take days. (De Nys, N., 2018)

Let's move on to sustainable development and eco-design.

According to Nicolas de Nys, it's all about materials. Sustainable development is about going for options that will last longer through time. Even though big companies might be against this concept, it has been more and more brought up in projects because it has started some kind of trend. Indeed, there is a lot of talking about upcycling or bio products. (De Nys, N., 2018)

But is it easily mixed with interior design? According to him, it's not the case today because people tend to want so many things at a very low price. This doesn't match up with the prices of good materials which tend to cost more than the average ones on the market. However, Mr de Nys justifies its price through the fact that there is a trend related to it as well as the quality which will help to make the interiors last a lot longer. (De Nys, N., 2018)

On the subject of eco-design, he considers that eco-design mixes the need for aesthetics with the need for sustainability for the environment and the economy. Hence, it could be some kind of middle between the three dimensions of sustainable development. As for the practices that he can link to eco-design, he mentions the LED lamps which consume a lot less energy while providing a warmer lighting, some new materials and recycled materials that help reduce wastes. (De Nys, N., 2018)

Now, what are the limiting factors for eco-design in his opinion?

Firstly, consumers don't care enough about it yet. Also, he points out the big companies which slow down the process in order to be guaranteed to earn money thanks to their unsustainable models. Lastly, he thinks that eco-design isn't appealing to consumers. Even though there are more and more marketing done on the subject, it's not working because change takes time in this case because it affects the lifestyle as well as the thoughts of the population. However, he remains quite optimistic in the growth of this concept. (De Nys, N., 2018)

Mr Echard is a sociologist who has been working on sustainable development for a long time, providing a useful insight on the topic of eco-design as well as its chances in interior design and with consumers. His interview happened in Brussels, on the 25th of May. It took place in person, at ESA Saint-Luc.

In other words, the reason why I wanted to ask questions to Pierre Echard is because he seemed to be specialized in sustainable development related to design, and most importantly interior design as the students for whom he is teaching are soon-to-be interior designers. Furthermore, it seemed interesting to me to interview someone who wasn't an interior designer yet who was connected to them because it was a way for me to check the objectivity of the other interior designers.

Pierre Echard has been working on sustainable development for about twenty to thirty years. He studied both development sociology and business. He worked for NGOs in Africa and France but also for the United Nations, always related to sustainable development. Afterwards, he worked in corporate social responsibility which allowed him to include notions of sustainable development in the business world. Then, he started teaching on social entrepreneurship which is in-between an NGO and the common firm that we all know. He also created a new master at ESA Saint-Luc about social design alongside working with MAD Brussels in their research lab on social innovation by design. In addition to that, he also works for companies looking for a transition towards a circular economy by using Design Thinking as an approach. (Echard, P., 2018)

INTERVIEW

As done with Alexandre Auquier and Nicolas de Nys, I will deliver the interview guide that I've used during our meeting. It is very similar to the ones used for the two interior designers but, for the same reason as for Nicolas de Nys, I will still insert it here as a wish for transparency. But first, I'll go through it in order to explain its structure.

To begin with, I asked about himself in order to better understand his background as well as the different activities he was involved in. It was a way for me to better understand how he was related to interior design and what extent I was going to be able to ask him about it.

Afterwards, I went on and asked about the theoretical concepts of my problematic known as design, innovation and added value. Since he is currently teaching content related to design, it seemed to make sense to me to ask him about his vision on these different notions. As well, thanks to the fact that he is a sociologist, I found it interesting

to ask him about consumers and their reactions towards individualization and their emotional dimension.

Then, I moved on to the concept of sustainability and sustainable development. As he is specialized on the matter, it seemed obvious that this question had to be asked in order to check if the previous researches made on the topic were on the right track.

Also, as for Alexandre Auquier and Nicolas de Nys, I checked if ethics was a factor that I needed to analyze for my research question. As he had another background, I had to make sure to have the confirmation that this notion didn't need to be developed.

Lastly, I tackled eco-design as, even though he isn't an interior designer, he knows a lot about it. Indeed, even though he doesn't have the qualifications, he knows the impact of the distinctive practices in order to make accurate analyses linked to them.

Concepts	Theme	Questions
Interior design	• Experience	• Could you explain your career? • How would you describe your work?
	• Design	• How would you describe the word "design"? According to you, what are its main concepts? • Do you think that it has a link with innovation? Either way, why? • How would you define "added value"? • Is there a movement to individualization?
	• Consumers	• How would you weight the customers' emotional dimension compared to the other dimensions (such as economic for instance)?
Sustainability	• Concept	• According to you, what is sustainability?
Ethics	• Opinion	• Do ethics have an importance for you?
	• Consumers	• Do you think that ethics has taken more space in the consumers' minds? / Is ethics becoming central for them? Either way, why?

Eco-design		
	• Concept	• Are you aware of eco-design? If so, how would you describe it? • Do consumers have more concerns about the environment related to the interior design market?
	• Energy	• What are the different practices that you use related to energy conservation? • Do you think that there is a wide range to choose from?
	• Materials	• How do you feel about sustainable materials? • Do you think that there is a wide range to choose from?
	• Water	• Are you aware of systems to conserve water? • Do you think that there is a wide range to choose from?
	• Health	• What could be done in order to ensure the health of the consumers?
	• Constraints	• Which constraints are there to switch for eco-design?

SUMMARY

Let's begin this analysis with his explanation of my problematic.

According to him, design is all about the conception. We could create anything from goods or services to spaces. As a result, it is a combination of various elements. (Echard, P., 2018)

As for the topic of "innovation", design relates to it. He makes an extension to Design Thinking, and more specifically the "ideation" phase which is where tons of ideas can come out. This specific step is the one that leads to innovation because the designer will look to find brand-new solutions. It also shows that innovation requires different

disciplines since there are many factors to think about, which is also the case for interior design. (Echard, P., 2018)

Pierre Echard perceives added value as what is being added, which means that it can be anything. However, it has to meet the financial, social and environmental needs that are essential for the economy. He stresses out the importance for added value to respect the three pillars of design which are technical feasibility, financial profitability and desirability of the user. (Echard, P., 2018)

Related to the specific pillar of desirability, he explains that it has so much importance in comparison of the others that the society tends to want to create it. As a result, companies no longer meet needs but create desirability for their own purpose. He takes as examples the speed of fashion trends and planned obsolescence. However, he stresses out the importance of taking it into consideration because no solutions would be viable if the three pillars aren't respected. (Echard, P., 2018)

What about the ability to make sustainable development more specific for each individual? Pierre Echard explains that the fact that there are so many options available nowadays as well as the multiple relations that sustainable development has with diverse fields makes it very easy to offer a personalized answer to consumers. (Echard, P., 2018)

Let's focus on sustainability and sustainable development. In order to explain these concepts, he reminds the definition of Brundtland (1987) who is stressing the importance of meeting the current needs without affecting the future generations. (Brundtland, G.H., 1987) Alongside this definition, he repeats the importance of focusing on meeting the needs and delivering solutions that suit and are comfortable for the consumer which will enhance the viability of what is offered. Ethics can only be useful in order to meet the needs of a community which will give the feeling of community to users and not create the fear of rejection from others. Besides, ethics shouldn't be the main reason to go for sustainable options because it is not enough of a stimulator for firms. It is for that specific reason that sustainable development has to make "business sense". (Echard, P., 2018)

Lastly, concerning eco-design, Pierre Echard explains that it is simply creating while being eco-friendly. While others mostly focus on it for the conception phase, eco-design should be regarded as a cycle of life. Eco-design concerns the resources used as well as the end life of a product, enhancing that notion of circularity. However, eco-design isn't common because it doesn't seem to interest enough the consumer. The reason why is because it doesn't seem to make sense to him yet in terms of use. According to Mr Echard, eco-design will really work out when it will replace design because design should be ecological anyways. Same goes for sustainable development in the society, it should be common knowledge and be logical for everyone. (Echard, P., 2018)

As constraints, Pierre Echard points out the lack of incentives from the countries for companies as well as the lack of education. Governments don't put restrictions nor stimulators to push companies to go circular nor is the education going far enough for the population to fully understand the need for sustainability. Also, laws aren't forcing companies to be fully transparent about the lifecycle of what they offer nor are there laws to limit what goes to waste, and the fact that legislations in Belgium are divided between several levels of power doesn't help. Besides, sustainable alternatives aren't as profitable as the unsustainable options because the environmental costs aren't taken into consideration in the economy of today. Indeed, if we could take the cost of the overall life of a product, sustainable options would win for sure and there would be another economic system put in place. Furthermore, big companies slow down the transition to sustainable energies because they want to centralize energy rather than allowing micro-energies such as solar energy or wind pumps. Lastly, there's the image that environmentally responsible goods and services have. Actually, what is sustainable and delivered can seem not to be reliable because it suffers from being portrayed as bohemian. (Echard, P., 2018)

CONSUMERS

To complete the conclusions that I could have made linked to my research question, I have decided to create a survey in order to know more about consumers. Indeed, they will define if eco-design is interesting in the case of interior design because the final entity is destined to them.

This survey aims to have the opinions of consumers on numerous topics affecting interior designers as well as eco-design in order to help come up with an answer for the research question. I have decided to go for a survey rather than qualitative interviews in the case of consumers because there were no specificities in the theory related to the customers that needed to be surveyed. Furthermore, the people answering this survey have been picked randomly as I have made it online through Google Forms and made it anonymous for anyone to feel free to answer without the fear of being picked on for what they had chosen. The consumers that were interviewed all live in Belgium and have answered within a period of two weeks during the month of July.

Overall, there were 28 to 45 answers to this survey. These two numbers are because some questions were added later on, which means that the first people who answered the survey didn't get the opportunity to answer all of them. Furthermore, the number of people who were sent the survey and didn't answer can't be estimated as the survey has been shared by various people thanks to their network, which results in an inability to provide an answer rate. However, as far as the difference of a number of answers between a question and another is concerned, I don't consider it as being an issue as, even after the addition of questions, the people that answered remained random.

As a background, it could be useful to keep in mind that, in 2016, more than a third of revenues of households (around 12.300 euros per year) in Belgium was dedicated to the housing and its related expenses (STATBEL, 2017). However, as we are 2018, this estimation should be reconsidered in order to be up-to-date.

SURVEY

Even though it hadn't been presented as such (only the questions were given but not the concepts and themes), here is the survey guide that I have used to ask for the opinions of consumers on the different topics developed in this work and which will be useful in order to establish the limiting factors for eco-design in interior design. As I've done with the interviews, I decided to put the guide here in order for readers to better understand my motivations behind those questions as well as the topics that were targeted through them.

I have divided it into 5 distinct concepts.

Firstly, I have set the tone concerning interior design by checking if they were familiar with hiring an interior designer as well as the importance that design has in their life thanks to the budget that they allocate for their interior each year.

Secondly, I tackled the topic of Design Thinking to check if the desirability dimension which relates to emotions and their satisfaction level was indeed the most important factor instead of the economic and technical factors.

Then, I moved on to some aspects of the SWOT where I thought that their opinion could help me to affirm certain hypotheses. Hence, I firstly asked about their familiarity with the new technologies as well as their interest in the emerging ones. Afterwards, I asked about co-design to see if they had a real interest in being involved in their interior projects. I finished up by asking about their access to information as well as their use of online platforms and consumption of products from mass production companies.

Also, I asked about sustainability by seeing if it was something that they cared about. In addition to that, I checked if they were familiar with the notion of eco-design in order to see if it was commonly understood. Furthermore, I went deeper to see if green consumption was really something that they cared about as well as if they were willing to pay the price for it. Besides, I looked at the factors that I had studied that influence consumption in order to see if they were really factors that people were looking at. Lastly, I tried to link sustainable development and interior design in order to see if consumers were really caring about the combination of these two fields.

Finally, I ended it up with questions about themselves. As I said, I wanted it to remain anonymous. However, I still wanted to have some information to know which gender had mostly answered and affected the results, their occupation which could affect their financial means as well as their age to see if the trends weren't linked to generations.

Concepts	**Theme**	**Questions**
Interior design	• Experience	• Have you ever consulted an interior designer?
	• Budget	• What is your average annual budget for interior design?
Design Thinking	• Notions	• In a design project that you would have asked for, please rank these three notions (emotional/satisfaction, budget, technical specificities) according to their importance for you.
SWOT	• New technologies	• Please rate from 0 to 10 how familiar you are with technologies (smartphones, computers…). • Please rate from 0 to 10 your interest in the following technologies (3-D visualization, Virtual Reality).
	• Co-design	• In an interior design project that you would have asked for, would you like to be involved in the designing process?
	• Information	• Please rate from 0 to 10 how easy the access to information is for you nowadays. • Do you use online platforms (as Pinterest) to get new design ideas? • Have mass production companies (as IKEA) raised your interest for interior design?
Sustainability	• Concept	• Is sustainability an important notion for you?

	• Eco-design	• Do you know about "eco-design"?
	• Consumption	• Would you be ready to pay more for sustainable materials/systems/practices? • Do you trust "green products" (recycled products, sustainable materials…)? • Please rate how the following aspects influence your decision-making (trends, the perception of others, the trustworthiness, stigmas, environmental responsibility, reviews)
	• Interior design	• Would you be more likely to go to a specific interior designer due to his high concerns for the environment?
Consumer	• Informations	• Are you a female, male, transgender or not listed? • Are you a student, unemployed, employee, independent, retired? • Which age range are you (<18, 18-25, 26-35, 36-45, 46-60, >60)?

SUMMARY

I will now summarize the results of this survey in order to better understand the link that I will make in the final analysis.

Let's first see the population that has answered my survey. 62,2% of the people who answered were women against 37,8% of men. Therefore, there is no transgender nor people who didn't find their sex listed who answered the questionnaire. As for the occupation, 42,2% were students, 20% were employees, 17,8% were independent, 11% were retired and 8,9% were unemployed. In addition to that, about 42,2% were under 25 years old, 22,2% were between 46 and 60 years old, 15,6% were between 36 and 45 years old, 11,1% were over 60 years old and 8,9% were between 26 and 35 years old. Therefore, I can say that the majority of the people that have participated in the survey are relatively young and represent the youngest generation.

Average annual budget for interior design (in €)

■ Average annual budget for interior design (in €)
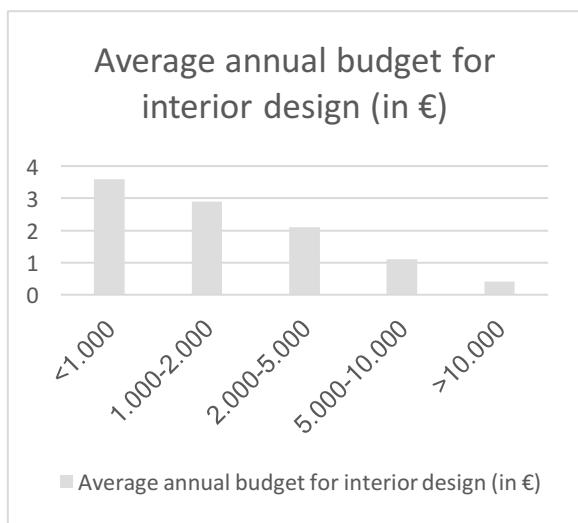
Now, let's focus on their experience and budget for interior design. 77,8% said that they have never asked for the services of an interior designer while 22,2% did. In parallel, 35,7% said to allocate less than 1000€ annually for their interior, 26,6% between 1000 and 2000€, 21,4% between 2000 and 5000€, 10,7% between 5000 and 10.000€ and 3,6% more than 10.000€. These results make sense as it can be seen that not many people have consulted an interior designer which is probably because of the price that they can give to their interior.

Importance of satisfaction

■ The most important

■ The second most important

■ The least important

Importance of budget

■ The most important

■ The second most important

■ The least important

Importance of technical specificities

■ The most important

■ The second most important

■ The least important
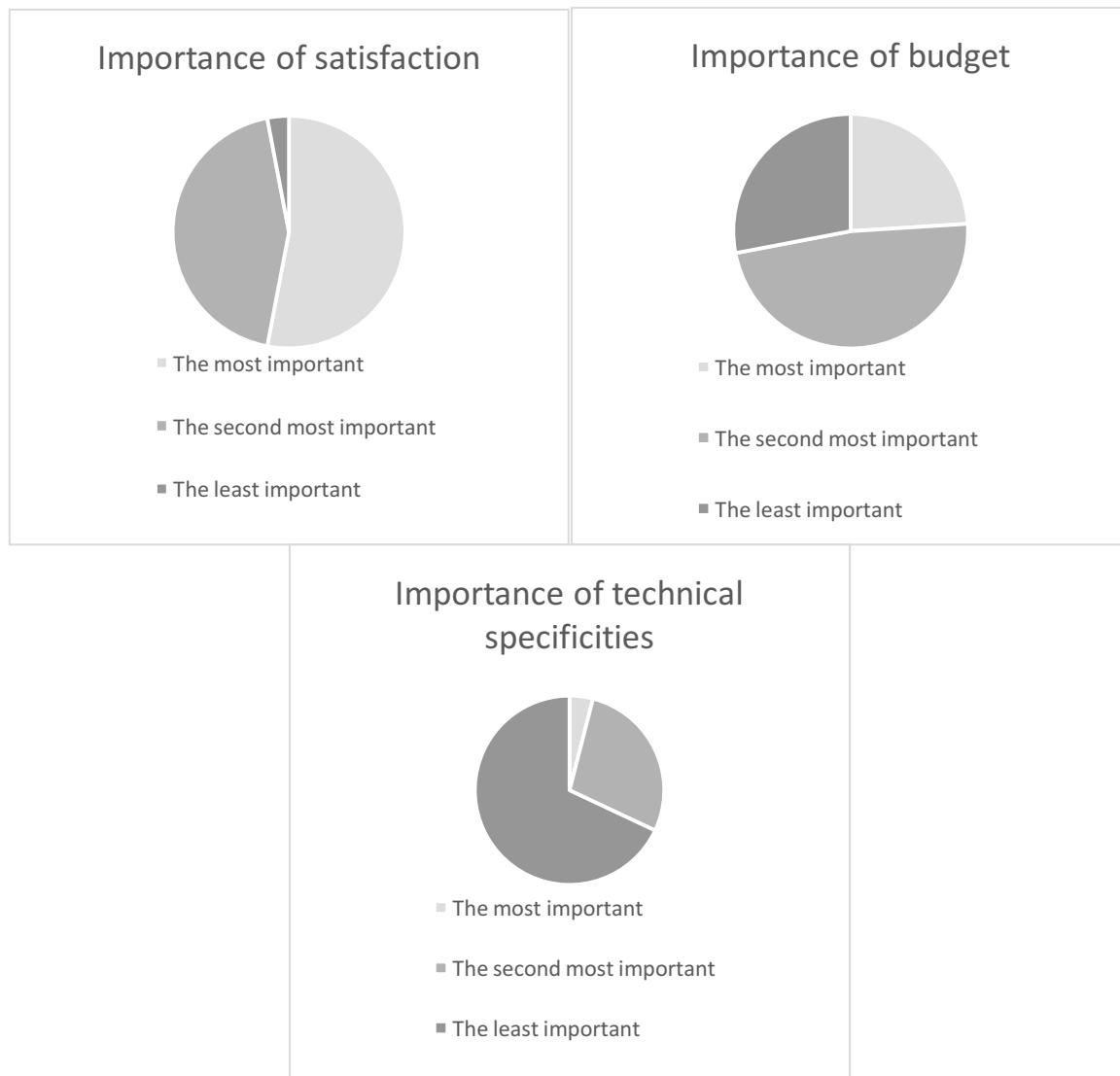
As for Design Thinking, we can clearly see that the emotional dimension and the satisfaction is what consumers mainly care about as they are 52,9% to consider it as the most important notion for them, against 44,1% who consider it as the second most important factor and 3% who consider it as the least important notion. After this, budget is considered the second most important notion with 48% considering it as the second most important factor, alongside 28% considering as the least important and 24% considering it as the most important. Lastly, technical specificities are considered as the least important with a majority of 68%, while 28% considers it as the second notion that they check the most and 4% considering it as the most important aspect against the three others.

Let's move on to the opportunities in interior design. 84,4% said they want to be involved in the process of co-design while 4,4% don't want to and 11,1% don't know about it. Concerning the technologies, it can be said that most people are familiar with them. Indeed, 48,9% considers themselves very in phase with them, 35,6% consider relatively in phase with them and 13,3% consider themselves in the middle while only 2,2% don't consider that they are familiar enough with technologies. Besides, 46,7% of the people interrogated are interested in 3-D visualization as well as there is 44,4% that is interested in Virtual Reality, against 20% in both cases who find themselves in the middle and 33,3% to 35,6% aren't so interested or not interested at all in these emerging technologies. All these factors translate a certain comfort with new technologies as well as an interest in being involved in the creation process.

In parallel, 68,9% consider that, today, they have it really easy to find information, next to 24,4% who thinks that have it relatively easy and only 6,7% find themselves in the middle. Related to that, about 48,9% use online platforms for inspiration, against 46,7% who don't and 4,4% who don't know. Talking about inspiration, mass production companies are said to have influenced their interest for interior design since 60% says to have been relatively to very influenced by them against 22,2% who don't know and 17,8% who are negative about this affirmation. As a result, it can be said that the population considers itself as being educated on interior design and is aware about the different ways that it could look for new ideas.

What about sustainability? It seems as it is a very important notion for consumers as 62,2% said to care very much to relatively much about it, against 33,3% who don't know and 4,4% who say that they perceive sustainability as not being as important.

The notion of sustainability was also implied in the question related to

Importance of sustainability

■ Important ■ Neutral ■ Not important
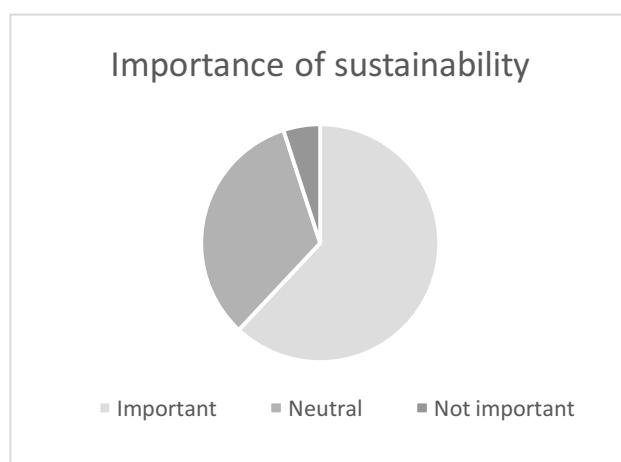
the aspects influencing the decision-making. Indeed, I asked if environmental responsibility was something that they were taking into consideration in the case of buying behaviour and it seemed to be an important factor as 46,7% considers it is relatively to very important. Alongside this concept, I also asked about the influence of trends, others' perception, the trustworthiness of a product, stigmas and reviews. As a result, the trustworthiness seemed to be the leading factor as 97,8% of the people surveyed really value it and the same goes for reviews with 77,8% who think that it can influence their decision-making. As for trends, 53,3% find themselves influenced by them and same goes for the perception of others where the majority (40%) consider it as important. However, the only factor that the surveyed people have said not to be influenced by is a stigma since 55,6% of them declare not to be. As a result, we can say that most of these people have agreed on the importance of these aspects on them, except for one (stigmas).

Let's finish up with eco-design and green consumption as well as its possible relationship with interior design.

People knowing eco-design

Knowing   Not knowing

In the question in which I asked if this notion was known, 50% said yes and 50% said no. There are two things that we can learn from this. On the one hand, there is a relatively big number of people who understand the concept which will make it less hard to spread it in consumers' minds. On the other hand, many people also don't know about this notion which means that there is still relatively lots of work to be done it mainstream.

The same happened when I chose to focus on the price of sustainable alternatives. 42,9% said to agree to pay more for sustainable practices which is the same number of people who said not to agree to pay more but instead pay the same as the competition. What could be interesting here are the undecided people who amount for 14,3% and, therefore, could be oriented in one of these two options after more information.

While trustworthiness seemed to be important, this notion is proven through the question about green products. 60% are said to trust them while 6,7% don't and 33,3% are lost. Good news for this research, people seem to be positive about sustainable products. However, still a big amount doesn't know and we could relate it to the fact that not everyone understands the concept of eco-design.

Lastly, the link between sustainable development and interior design. The majority of people (51,1%) say that environmental concerns coming from the interior designer could be decisive in their election from the consumer while 35,6% don't consider

the environmental considerations of the interior designer influencing their choice in interior designers and 13,3% don't know how to feel about it. Hence, it could be said that sustainable development has its place in interior design even though there could be some scepticism.

ANALYSIS OF THE RESULTS

Let's gather all the information that has been raised in the interviews as well as the survey in order to have a better view on what we have understood and on how it will be related in the conclusion.

Let's begin with the problematic related to design, innovation and added value.

Design has been seen as depending of the era that it relates to as well as its final goal, its concept. Furthermore, as its conception can imply many interactions with other disciplines, it surely has to deal with and combine various elements in order to get to that goal.

As in design, innovation can start from something that has been already done as long as it finds a way to break away from it through various means such as new technologies and new practices. It can relate to Design Thinking thanks to the Ideation phase in which designers have to think about all the different possibilities to find solutions to a problem. Besides, it also requires a collaboration between multiple disciplines in order to fully create an innovation.

How has added value been seen? Actually, it can be anything as long as it brings something more. In the case of interior design, it's mainly about providing an original space to the client in order to feel as if he's different, he has his own universe, while being fully satisfied because, not only did his demands be answered, he has been brought even further than what he had pictured in his mind. However, this added value has to meet the requirements of design in terms of feasibility, viability and desirability, as well as the needs of sustainable development known to be financial, social and environmental.

Let's move on to the threats of mass manufacturers and online platforms.

Companies such as IKEA have been denied being negative for interior designers and are rather seen as stimulators for the industry as they help for the education of the population about design. Furthermore, while these companies tend to have very low prices due to their mass market, interior designers don't feel concerned as they try to answer the needs of each individual in a different way every time. However, it has to be stressed that most people, as shown in the survey, haven't the budget to hire an interior designer which is why mass manufacturers have such success.

As for online platforms, they have been confirmed to be threats because of their dangerous influence on the brainstorming process. Indeed, it tends to trick the interior designer and his clients into recreating what has already been done and, therefore, doesn't meet the need for differentiation and satisfaction. The survey has confirmed the relative influence of these platforms as well as how easy it was to find information.

Along the lines of what impacts interior design, the number of people working on the projects has been stressed out as a major factor of difficulty. In addition, the burden of the budget as well as the pressure to finish projects very quickly are important problems since the rise of use of different techniques causes the projects to take more time. Furthermore, an interior designer is very dependent on the people that he hires for his projects which puts him in a complicated situation since, not only is he the final person responsible for the project, there is also a dilution of the responsibilities related to the different disciplines involved as well as a rising difficulty to communicate with the people working on site.

Let's carry on with this analysis through two opportunities for interior designers, co-design and emerging technologies.

Co-design is definitely something to consider in interior design since the survey has shown a strong interest for people to be more involved in the creation process. However, co-design has shown to have both positive and negative aspects. On the positive part, it has been confirmed that people know more, which pushes interior designers to challenge themselves more as well as respect of others' perceptions and visions. Nevertheless, such practices can also be dangerous because, even though people know more, they still are unable to know what is right for their projects, which is why the interior designer is for.

Also, technologies such as Virtual Reality and 3-D visualization have been confirmed as interesting for consumers. Its utility has also been backed up since it helps to better structure and visualize projects. In other words, not only does it help the designer to express his ideas, it also makes it easier for the client to understand and picture them.

Let's focus now on the design dimensions and what affects people's decisions.

Regarding the "Three Lenses of Human-Centered Design", the desirability factor has been confirmed as the most important for consumers because budget is often exceeded and technical specificities are far from being their priority. Indeed, as shown in the survey, satisfaction is the first factor that they take into consideration, budget is the second one and technical features are the last ones. However, the interior designer stresses the necessity to meet the three needs because they can also restrict one another even if satisfaction tends to win at the end. Besides, desirability has been so much regarded for

now that companies tend to try to create it in order to develop a constant demand (e.g. fashion cycles).

In addition to these factors, trustworthiness and reviews seem to be the most important notions for consumers. Therefore, the survey has shown that consumers like to have a backup of information when they purchase a good or a service. After that, there are trends and the perceptions of others. As a result from that, we can see that people still need to feel as if they were part of a community and that others are agreeing with their behaviours. Lastly, there are stigmas since, even though consumers have claimed not to be influenced by them, we can assume that they have answered in a such way due to the negative connotation that this word contains.

What about sustainable development?

Consumers have confirmed their interest in this subject as well as the fact that it can influence their decision-making. Besides, they have also shown that its involvement in interior design would be interesting for them, which goes along the line of its growing importance in big interior projects. As for how it was perceived by interior designers, it was often linked to the circular economy and the notion of an entity that should be lasting through time. In addition to that, they have confirmed a trend that is being developed in interior design related to sustainability.

From a sustainable point of view, let's tackle now eco-design and the different aspects related to it.

Generally, eco-design has been understood as the mix of aesthetics with sustainability for the environment and the economy, which is the middle between the three dimensions of sustainable development. It has been described as creating while keeping in mind to do it in an eco-friendly way. In order to do so, eco-design should integrate the entire cycle of life, which reminds the idea of circularity. Thanks to the survey, we understand now that as many consumers know about it as the ones who don't. Hence, it can be said that there's still work to do in order to make it clearer in the eyes of the population, even though there's already a good number of people who are aware of it. As well, as many people are willing to pay more for environmentally friendly products as the ones who would agree if their prices were aligned to the ones of the competition. Thanks to this, we can back up what the interior designers have explained which is that eco-design should be concerned about the well-being of the consumers since it's mainly what the consumers are thinking about (rather than environmental concerns). In addition to that, the survey has revealed that the majority of consumers trust green products while a remaining big amount of them doesn't know how they feel about it. The big amount can be explained by the fact that there are many people who don't really know about eco-design as well as they may have mixed feelings about the current prices of these products on the market.

Related to the components of eco-design, known as energy, materials, water and health, interior designers have all agreed that there were enough alternatives for consumers to choose from. In terms of energy, the LED lamps were mentioned a lot, alongside energy management systems and home automation. As for materials, the struggle to find sustainable ones and install them isn't there anymore, or has at least decreased compared to before. Then, concerning water, it was said that there were enough incentives in order not to waste it. Lastly, about health, ventilation seemed to be the main subject and remains quite underestimated.

Let's finish up with the limiting factors for eco-design in interior design.

Firstly, the government has been pointed out because it seems as if there wasn't enough support from their side in terms of incentives and restrictions regarding companies and consumers. Besides, there are no laws that force firms to be fully transparent about the lifecycle of what they are offering nor laws in order to limit waste. Indeed, the environmental costs aren't forced to be displayed which makes it harder for the population to really know the impact of their consumption. Moreover, interior design already contains some issues which don't help either. Actually, there is a lack of regulations related to this profession which is not well understood and doesn't benefit from an association which would reunite all the interior designers.

Secondly, the education was addressed. Even though environment is a subject that is more often tackled in classrooms, it is not sufficient for the young generation to make real changes in their consumption behaviour. Hence, there should be more efforts in order to allow changes to happen from a young age. In addition to that, it has to be stressed that change takes time and even more in this case because it affects the lifestyle and the mentality of the population.

Thirdly, the marketing of environmentally friendly products and services have been considered as not enough, especially that their current higher prices and higher difficulty to implement are already working against this trend. Besides, it is very hard for interior designers to create projects respecting the eco-design principles because, since they are more expensive, there's a real work to convince and explain to the customers that, even if the starting price is higher than unsustainable alternatives, they remain the most profitable because they will last longer.

Next, there is the role of big corporations which slow down the implementation for sustainable alternatives. Indeed, there's a wish for centralization of energies, which slows down micro-energies (e.g. solar power). Since most interior designers work as independents, it makes it even harder for them to counter these firms.

Lastly, eco-design suffers from an image that isn't stimulating the demand for it. In fact, it doesn't make sense for customers to use it just yet because it has this hippie kind of image that has been attributed to it. Furthermore, since it's important to meet people's needs, eco-design shouldn't forget that it has to provide comfortable solutions to its users to assure its viability. In other words, eco-design has to make sense in terms of business and it seems as if this goal hasn't been reached for now.

CONCLUSION

This conclusion will be divided into three main parts. The two first sections will include sources that have been already quoted in this thesis as well as new sources in order to back up what has been explained and verified, while the last one will reflect on the work in its totality.

I will start by summarizing an answer to the research question which focuses on the limiting factors for the establishment of eco-design in interior design. As several reasons have been tackled through different sources as well as the interviews and the survey, it seems important to summarize an answer to the question.

Later, I will provide some recommendations to help eco-design to have better chances to become widely used by interior designers as well as to be more desired by the customers. I will use the opportunities that I have developed thanks to various authors as well as what has been said by interior designers and consumers who have been interviewed/surveyed.

Lastly, we will take some distance in order to add some critics about this work. Indeed, some things could have been improved or done in another way, hence why this section can be interesting for further researches.

LIMITING FACTORS

Let's begin with what De Jesus and Mendonça (2018) have explained. They have divided the barriers as hard and soft (cfr. p.43).

Among the hard barriers, the firsts that have been tackled by the authors are the technical factors. It is very important because it can affect the lifecycle of the creation as well as if it meets the basic needs of the customers. It can be decisive for turning to eco-design because the transition can be slowed down by the existence or non-existence of correct technologies as well as by issues related to people being unaware of or unspecialized in technologies. Another aspect that has been tackled was the economical notion. Indeed, barriers such as high costs that are necessary from the start as well as the way that the customers feel about a new market can be difficult to overcome (De Jesus, A., Mendonça, S., 2018). Through the interviews, it was understood that the fact that environmental costs weren't taken into account in the overall costs was the major limiting economic aspect.

As for the soft barriers, institutions as well as regulations have been pointed out first. Indeed, the lack of public policy measures acting on markets as well as helping to

create a context promoting progresses thanks to innovation and entrepreneurship are limiting factors to the adoption of eco-design. While De Jesus and Mendonça (2018) claim that governments can have a real impact to promote a certain behaviour (De Jesus, A., Mendonça, S., 2018), it doesn't seem like the authorities aren't doing sufficient work on that field. Thanks to the survey and the interviews, it could be said that there is clearly not enough back up coming from the government for companies and consumers. Furthermore, not only does eco-design lack support, interior designers could also use more clarity thanks to authorities by setting more regulations which could help have a better understanding of their profession. Also, social factors such as the slow speed to change habits as well as "inadequate awareness and information" can be major barriers (De Jesus, A., Mendonça, S., 2018). The people that were interviewed stressed the need for more education on the matter of sustainable development in order for change to occur more rapidly. In parallel, the survey showed that more explanation on the matter could be useful as a big amount of people didn't know about eco-design or wasn't capable of taking a stand related to that subject.

Let's move on to other barriers which are more specific to interior design.

Here, the interviews were very useful in order to better visualize the work of an interior designer and, therefore, what was affecting his profession. As a result, it can first be said that the number of disciplines and workforce that is necessary can already be difficult for any interior project. In order to focus on sustainability, even more people could be necessary which could complicate the control capacity of the interior designer since he would be even more dependent on other people. Besides, the fact that there is a dilution of responsibility made by the workers' employers combined to communication difficulties caused by globalization doesn't make it easy to manage a program.

Furthermore, the current situation stresses the need for speed while allocating a very tight budget. This represents a major barrier for eco-design as sustainable development usually requires more techniques to be used which raises the overall price as well as the time needed. Also, the price of sustainable alternatives wasn't acting in favour of eco-design as it is complicated for interior designers to justify the costs even though it was surely more beneficial for the customer as it is more profitable on the long run. This barrier is major since, as Hayles (2015) has explained, it is the most important constraint. (Hayles, C. S., 2015)

In addition to that, online platforms affect interior designers in their Ideation process. Indeed, it affects their brainstorming which will eventually make them recreate a previous interior. It is a barrier for eco-design as it requires innovation as well as to take all sustainable development and Design Thinking principles into account, and these websites and apps have the tendency to lead the creator in a certain direction which could ignore these factors. Furthermore, Atkinson (2006) also pointed it out considering that it fuels the Do It Yourself trend which makes the consumer more independent and less

likely to ask for the services of an interior designer at all, reducing his capacity to suggest sustainable alternatives. (Atkinson, P., 2006)

Lastly, Tan, Johnstone and Yang (2016) have studied what could prevent consumers to go for green consumption. (cfr. p.36)

The barriers that have been developed were "consumers' green perceptions, product perceptions, green stigma, readiness (…) to be green" and the perception of the current environmental situation as well as of the efforts' that change could provoke. (Tan, L. P., Johnstone, M. L., Yang, L., 2016) More about the perception of eco-design, it appeared that environmentally friendly alternatives weren't attractive to consumers. It doesn't make sense for them to turn to eco-design (unless concerns for sustainability) and it also suffers from an image that is rather hippie, which adds in the difficulty to implement sustainable development ideas in interior design. It is confirmed by Hayles (2015) who has explained that it is necessary for interior designers to meet the needs and preferences of the clients in order to make sense for them to go for sustainable options. (Hayles, C. S., 2015)

I will begin this section with the two opportunities that were developed alongside eco-design: co-design and emerging technologies. It would be advised to combine these opportunities with eco-design in order to fully answer to the customers' needs and raising its chances for success in interior design.

Thanks to the survey that has been done, it can be affirmed that co-design, known as the inclusion of the user in the design process (Côté, V., Bélanger, L., & Gagnon, C., 2017), can be really popular. As not only do people know more and have access to more information, they also really want to be involved in the creation process of their interior as there is a growing need for democratisation in design (Kahane, B., 2015). Furthermore, it could help the interior designer to be seen as more concerned about his customers' needs and a collaborator in addition of a coordinator. (Côté, V., Bélanger, L., & Gagnon, C., 2017)

Again, through the survey, it has been possible to verify the interest of consumers for emerging technologies. In addition to being very useful to interior designers in order to represent what they imagine for their clients, people seem to be interested by Virtual Reality and 3-D visualization and are familiar enough with technologies to enable its wide use in the profession. It confirms the says of Lee (2009) because she had already explained that emerging technologies help to summarize complicated aspects that could be difficult to explain to the customer as well as increase the productivity due to their precision. (Lee, S., 2009)

I will move on to factors influencing the decisions of consumers.

In design, it is important to answer different needs. However, it seems as interior designers should really pay attention to one factor: satisfaction. Even though it is important to respect the budget that has been set as well as the technical specificities that are needed for the project, interior designers can help to implement eco-design by focusing on the emotions of clients since it has been proven that it is the most important factor for them. Alongside emotions, well-being of consumers should also be kept in mind as, through this thesis, it seemed that it is more important than any environmental concern. As a result, it is important for interior designers to keep in mind people's needs while making sense economically.

Also, interior designers should help by trying to work on the trust of customers on environmentally friendly alternatives. As the survey has shown that it is the most important aspect that affects clients, interior designers could develop more sustainable options for their customers in order for them to trust it more easily since the survey shows that a large number of people don't know if they can. Furthermore, they could also raise

awareness about eco-design as a relatively substantial number of the people surveyed ignore what it is and isn't willing to pay the price that it currently requires.

Peattie (2010) has developed different ways to promote green consumption behaviour. (Peattie, K., 2010) I will only develop the ones that could be useful for the purpose of this work.

The first motivator that the author has tackled is the issue of green labelling. A better use of it and new eco-labelling initiatives can help consumers to make wiser choices. For instance, information about the lifecycle, such as Pierre Echard has evoked, can help to influence consumption. Labels are recommended because, even if consumers consider themselves as having enough access to information, it can help provide accurate information and solve the lack of knowledge, especially about sustainability. (Peattie, K., 2010)

Another recommendation that could be used by interior designers can be to edit the choice of its customers. By that, we mean that he should offer consumers a limited number of options by "removing the least sustainable" ones (Peattie, K., 2010). Even if consumers should have access to all kinds of alternatives, it could help them not to drown in information which could lead to being lost and go back to unsustainable habits.

The third, and last advice of Peattie (2010) that will be used here, should be to work on social marketing, "the application of commercial marketing processes and tools to secure behavioural change to reach social or environmental goals" (Peattie, K., 2010). The reason why it could help eco-design is because it focuses on behaviours through both the social and the environmental aspect of creations which are usually forgotten due to the current emphasis on economic factors. More "collective action and activism" should also be helpful in order to address the shared changes needed to switch to eco-design since sustainable needs usually implies "community-based solutions". This combined to social marketing can make changes happen quicker. (Peattie, K., 2010)

What could be the critics about this thesis?

These are mainly related to the practical research that has been done through interviews and a survey.

Firstly, it could be said that, as Belgium had been chosen as the geographical limit for consumers, the interior designers that had been interviewed could have been from different parts of the country. Indeed, in this case, both Alexandre Auquier and Nicolas de Nys were active in Brussels. As a result, it could be useful to ask interior designers across Flanders and Wallonia about their vision on the research question as well.

Let's move on the survey where there are several aspects that could be improved.

Although there was a sufficient number of answers in order to show and understand some trends, it wasn't enough to make some statistics such as a standard deviation. It could be interesting to make another survey that would be answered by a wider population in order to get more into details about consumers.

Also, targets could be set. Indeed, in the case of this thesis, as the sources weren't pointing any specificities related to the subject of interior design and eco-design, the choice had been made to use the survey guide on any kind of customers. However, it could raise some questions considering the fact that most of the surveyed people said that they had never consulted an interior designer as well as that their budget was considerably small related to their interiors. Is this population representative of the population asking for the services of an interior designer? This question could lead to a selection of criteria that could be used for another survey or qualitative interviews.

Besides, questions related to their habitat could have been used. The surveyed population didn't have the opportunity to give many details about where they live: whether it's in an apartment or a house; whether they are renting, owners or still living with parental figures; their living costs; etc. Such information could be useful as they can influence their buying decisions.

Lastly, a better control on the transmission of the survey should be thought about for another research. In this case, as the survey was through Google Forms and shared by people who had already answered it, there was no possibility to know the overall number of people who received the survey and didn't answer, leading to an inability to calculate an answer rate.

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