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Designing Long-Lasting Products: Barriers for Design Consultancies

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Abstract

Past research shows there are significant barriers for creating long lasting products. In this paper we examine, the distinct collaborative barriers design consultancies face when striving to design long-lasting products for client firms. Data is collected through case studies (four months of observations and interviews) from three projects. Through the study we find indications, that the value chain intricacies, provide distinct interfirm barriers for creating long lasting products. These barriers include vision clashes, misalignment in the aspired manufacturing quality and price position.

Keywords: longevity, design activities, sustainable design, product design, design consultancies

1. Introduction

In recent years there has been a growing attention to our way of life and the way that it is affecting the world around us. Clean and conscious consumption have become a big part of our everyday lives in our effort to sustain ourselves and our world (see for example the UN Sustainability goals). In contribution to a more sustainable future, scholars have studied and elaborated on how to create a business that supports product durability (Cooper, T. 2005), how it is crucial to develop a focus on durability, to stay relevant in the future (Hagedorn, L. et al. 2018; Lilley, D. et al. 2019) and how to motivate the end-user to maintain their products for longer (Ertz, M. et al. 2017). However, researcher point at many of these studies, rely on an already invoked feeling of sustainable responsibility. In a recent review of the product lifetime, product obsolescence and product durability research Jensen, P. et al., 2021 finds that there in fact are several business, development and usage barriers, that stand in the way for designing long lasting products. Where barriers may be defined as explicit or inexplicit aspects that hinders the development, business or usage of long-lasting products. Moreover, the literature review also argues more barrier types may exist (Jensen, P. et al., 2021).

A rising number of design companies strive to create longer lasting and more sustainable designs and products, as the demand for these qualities are growing in the general public (Gnanapragasam et al. 2018). However, designing something is only a small part of a much larger value chain, where all the links must fit together properly, for any given company to realize their products. (Flores Ituarte, I. et al., 2016) There must be alignment on vision and value for all steps to bring a viable product onto the market (Lee, J., 2018). The problem persists whether it be an internal design department of a company or an external design company, however the design company will have much greater trouble aligning expectations and influencing the final product as they are most likely not an integrated part of their business partner's value chain. As such, the design company will often see their visions undermined in collaboration with their B2B partner. We argue that challenge of designing long lasting products may be further complicated and present additional barriers when the development activities are partaken by

a design consultancy. To date, there seems to be limited research on the cooperation when designing long lasting products in a B2B environment. This study seeks to examine the barriers product design consultancies face when striving to design longer lasting products.

2. Theory

To get a better understanding of the field being navigated in when looking into how design consultancies can push long lasting products, it is needed to specify definitions of long-lasting products, the barriers therefore and the position and role a design consultancy.

2.1. Barriers for Long lasting products

Long lasting products may be defined as "Products that are durable and considered useful and desirable by their users for a long period of time, and at the same time provide a viable business" (Jensen, P. et al., 2021). Other scholars also define the main aspect of prolonging any design's longevity to be a reduction of its environmental impact and thereby improving its sustainable qualities (Bakker et al. 2019, Stahel 2010). There are different reasons as to why every company does not produce long lasting products, even though the society is changing, and there is more and more focus on creating sustainable solutions. In order to create a theoretical framework for understanding the barriers faced by design consultancies, we first outline the three main categories (see table 1), namely: business barriers, development barriers and usage barriers (Jensen, P. et al., 2021).

Table 1. Barriers for long-lasting design (Jensen, P. et al., 2021)

Business barriers	Development barriers	Usage barriers
Barrier 1: Introducing long-lasting products entails a (costly) shift in the company's business model Barrier 2: Radical change in business model is rarely a viable option for companies Barrier 3: Introducing long-lasting products limits the company's ability to compete on price Barrier 4: Durable products are vulnerable to product-service systems, which promote frequent replacement Barrier 5: Altering customer perception of products and brands is a time-consuming challenge	Barrier 6: Long-lasting product limit designers from following fast-moving trends and fashion Barrier 7: Development's selection of technology may prove to be a risk for long-lasting products. Barrier 8: Development in companies that produce long-lasting products need to design for uncertain future societal behaviour Barrier 9: Developing long-lasting products create a double focus for developers	Barrier 10: Short life cycles promoted by companies, resulting in a change in user behaviour Barrier 11: Customers' lack of attachment to products results in premature substitution. Barrier 12: customers are unaware of material quality in durable products. Barrier 13: Evaluating expected product lifetime is difficult for customers in a purchase situation Barrier 14: Customer misperception of modularity in advanced products decrease the product's lifetime

Business barriers may be defined by negatively affecting motivation to adopt more sustainable production values or development of long-lasting products within a company. If companies do not see an easy way around the barriers or do not stand to gain obvious value going through them, they are unlikely to do so. Business barriers affect companies of all sizes; however, the barriers are more likely avoided by smaller or new companies (Mura et al. 2020). Established companies will usually have a strong, but stringent value chain which will make it difficult for them to turn things around as the larger and more set their value chains they are, the more costly a shift in them will be (Rizos et al. 2016, Dalhammar 2016). Established companies will also already have built up a reputation or brand perception which again requires time to alter (Simpson, Radford 2012) . Altering a company's product lines to produce longer lasting products may also hinder that company's ability to compete on price as quick turnarounds will become harder and development cycles longer (Loon et al. 2020). A design consultancy will have little influence in swaying collaborating a company's value chain as they are just an external component of said value chain (Pedersen, Clausen 2018).

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Development barriers may be defined by challenges faced in the development cycle of creating long lasting products. This includes design, engineering and development of such products and is likely to negatively affect the sustainability and durability of the products created (Hagedorn et al. 2018). In short, developmental barriers are defined by the added limitations in the developmental cycle, when companies have to also factor in durability (Cooper 1994). An example could be companies who follow immediate market trends - these companies will not see any business potential in developing long lasting products in markets where the future business potential cannot be calculated (Burns 2016, Lilley et al. 2016, Hollander et al. 2017). Meaning they do not necessarily have the time or the resources, or they simply do not see value gain, to properly carry out research and tests on their product's durability and longevity (Boks 2017). The developmental influence of a design consultancy depends on the client for which they work and how closely they intend to follow the vision of the design consultancy.

Usage barriers are defined as the barriers users experience when purchasing and using products they hope to use for a long time. The barrier in this group covers all the intricacies involved in identifying long lasting products and estimating their approximate lifetime. This type of barrier exists when companies are trying to reach the user. The users may face difficulty identifying which products are long lasting and which are not as they have become used to short product life cycles promoted by companies through the years (Mugge et al. 2006, Page 2014, Nes, Cramer 2005). A design consultancy would need to overcome these types of barriers in the design process by e.g. creating product transparency which makes it easy for the user to understand the longevity and durability of a product. (Jensen, P. et al., 2021).

2.2. Barriers for design Consultancies

When looking into the barriers faced by design consultancies when cooperating with their clients, it seems there is an increased complexity around the business and development barriers and how these interrelate - as these two are organizational separated. These two barrier categories both apply to design consultancies and them pushing long lasting products as they will face challenges both in their business relationships when trying to promote and push long lasting products through their partners and clients, and also in their development progress because of the difficulties they may face developing long lasting products for their clients. The usage barriers we consider to not increase, as these mainly apply to the end user and the intricacies, they face in using and understanding long lasting products. As a result, this barrier group has been excluded from the theoretical framework.

Many products are made by different companies cooperating, where they are in charge of different parts of the process. A company's value chain and product development process are split in different phases controlled by different departments or teams (Flores et al. 2016). For some companies all the processes might be executed in house, but a lot of companies outsource the concept development to a design consultancy (Feldman, Boult 2005). The design consultancy will take the role as the 'industrial designer' and will become a small part of a big process. It indicates that a design consultancy would have to fit their work, to the business of the client, in doing a concept design for them. Fitting a concept to a clients business, can include a lot of different things, depending on the products that are produced and what kind of company the client is.

Besides these very specific factors of the value chain, there is a more general one: the vision of the companies. Lee describes that the design consultancy also has agendas of their own, including corporate vision, philosophy and identity (Lee, J., 2018). The client does also have a vision for their company, that their products shall fit to, and that the concept design, proposed by the design consultancy, must fit into too. The design consultancy therefore has to consider their own vision and their client's vision, when offering a concept design proposal. Lee offers a modified version of Michael Porter's Value Chain (Porter's Value Chain: Understanding How Value is Created Within Organizations, n.d.) which changes both the primary and support activities of the company. Most noticeably, Lee has added, in the primary activities, that it is important for the design company to align their consulting to the level of the clients, have working procedures in identifying the client's needs, and understand and participate in the client's strategizing and product planning.

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Furthermore, it also states how it is important for the design consultancies to establish a clear identity and hereby a corporate brand. This is emphasized by Lee's addition in the secondary activities, where he explains how a company's identity, philosophy and vision is vital for functioning corporate infrastructure. Looking at the relationship between client and design consultancies, in relation to the barriers for the long-lasting products model, the design consultancy will function as the developers, that have to consider the value chain of their client, and the client will function as the business, with all the barriers introduced there. In this relationship, cooperating is crucial, but it is not yet researched as a barrier, when making long-lasting products.

3. Methodology

The design of this research is built up like a systematic combining (Dubois, A. et al., 2002) of observations (Jorgensen, D., 2008) and semi-structured interviews. Systematic combining was particularly useful because it allowed for a continuous cycle of alternating between the different research activities. As such, it was possible to get a deeper understanding of both the theoretical framework and the empirical data. The research aims to refine the existing theory of barriers for making long lasting products, by collecting unanticipated findings in combination with theoretical insights gained during the process (Dubois, A. et al., 2002). The findings are based on a four-month case study of the case company.

The aim, when collecting the data, has been to understand the world which was looked at and interacted with, and understanding how the persons cope when faced with different dilemmas. Evaluating the result afterwards was done with the perspective of truth criteria being when there is consensus about knowledge (O'Reilly, 2009).

Throughout the case study, four months of participant observations (Jorgensen, D., 2008) as a full-time design-intern have been executed. By doing this it was possible to get insights about processes in the case company, relationships among them and their clients, and understanding of different events over time. This method was especially relevant, since not much about the company, and how they act in different situations, was known beforehand.

For all the interviews that have been conducted for this paper, the method has been semi-structured interviews. The interview procedures are as follows: The intended employees were virally informed of the research topic and the essence of potential questions, for them to have time to mentally process relevant cases. Furthermore some, previously discussed, topics, derived from the internship, were included in the premade interview guide as to serve as a dialog-starter as well as some more direct questions about both their design philosophy and prior experience working with different industries of different sizes. The interviews, which lasted between 30 and 45 minutes were conducted with an open mindset by the research group, which served a great outcome as some topics only emerged after the interviewee elaborated on certain questions that became apparent during the open dialogues.

3.1. Case selection

The main case company is a furniture and interior design consultancy, located in Denmark. Their work is one part consultancy and one part working with their own designs in royalty-based agreements. The company, which consists of a very small team, provided rich data on barriers for designing long lasting products as the research group had access to all employees in the company, making them the primary source of knowledge of potential barriers for creating long lasting products. At the case company there is a great emphasis on making products that last, but as it was found, this involves some new aspects regarding the barriers proposed. As the case company only does conceptual designs, they are not the primary decisionmaker when it comes to the manufacturing of the products, which their clients are in charge of, which is why they instead focus on making a visual identity for the product that they intend should last for a long time.

Based on knowledge gained during a case study of 4 months of participant observations at the case company, it became apparent that design consultancies might suffer from some comprehensive misalignment, with their clients, in the aspect of wanting to design long lasting products.

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3.2. Data categorisation approach

The interviews were then transcribed, in order to get a better overview and a coherent understanding of the context. Throughout the interviews, the researchers coded 16 new insights into what could be standing in the way of design consultancies designing longer lasting products. To systematize the insights, the researchers tried to find correlations between them. These were divided into four categories. It should be noted that several insights overlap into two or more categories and their arrangement is therefore not definitive, but this arrangement is the basis for the analysis.

Table 2.

Category 1: The researchers found several insights that could be described as: "Which barriers are there in product design consultancies, when you want to push more sustainable products?" • Insight 1: It can involve a lot of risks to be experimenting even though it may lead to a good product • Insight 2: Influence can be easier in a partnership where the client is entering a new market. • Insight 3: If you put your own name to the design there will be a clash between wanting one's values to shine through and simply wanting to get the design out there. • Insight 4: There is a large difference to whether the designs are made for a specific customer or if they are made beforehand and then sold to a customer. The design consultancy's values will be more obvious with option no. 2. • Insight 5: Customers with a great focus on sustainability are hard to acquire as they have very high demands regarding sustainability - as such, with these customers you cannot also have customers who are not focused on sustainability • Insight 6: Design consultancies can have influence on the longevity of the design, but not the physical perseverance of the end product. • Insight 7: The design consultancies want to be sustainable, but the customers simply are not - and it is more important to run a financially healthy business, than to be value based. • Insight 8: There is great competition on product price and as such, sustainability often comes second.
Category 2: These insights were also found to have shared values, which could be defined as a second theme: "Why is it difficult for non-well established companies to prioritize long living products?" • Insight 5: Customers with a great focus on sustainability are hard to acquire as they have very high demands regarding sustainability - as such, with these customers you cannot also have customers who are not focused on sustainability. • Insight 7: The design consultancies want to be sustainable, but the customers simply are not - and it is more important to run a financially healthy business, than to be value based. • Insight 8: There is great competition on product price and as such, sustainability often comes second. • Insight 9: To start up their own production could help get personal values out, but it is a larger and costly task.
Category 3: When organizing the insights, the team discovered that some of the data was already covered by existing barriers in the article by Jensen et al. (2021). • Insight 10: To buy something more experimental it also has to be that much cheaper before most dare to make a purchase. • Insight 11: The ability to change product methods depends on how the client's supply chain is already structured. • Insight 12: To be able to sell a concept which is more sustainable than normal the design consultancy needs to spend much more energy to explain and sell the idea.
Category 4: Some of the insights that were found during the interviews, wasn't used to form the base of a theme. The reason for this was that they were found to be too far away from the original research topic. • Insight 13: Income is also an incentive to create long lasting aesthetics. • Insight 14: There is an increased customer focus on sustainability and longevity. • Insight 15: The design consultancy has to keep themselves updated with trends, but also avoid too fast-moving trends. • Insight 16: If you have the right customers it is easier to get more of these. To be able to create sustainable and long-lasting design you need the right customers, they are not easy to get a hold of

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The interviews led to numerous insights into the difficulties and problems regarding the creation of long-lasting products in the B2B design business. This coincided in two themes, from which one theme was chosen for further investigation, as it seems to include the most prominent reasons, to why the design consultancy does not produce more products with a longer life expectancy: “Which barriers are there in product design consultancies, when you want to push longer lasting products?”

4. Analysis of problem themes

It was found that the three most important problems to dive into were: lack of quality in manufacturing, price overshadows longevity, and misalignment in the case company and their client's vision, which are outlined in the following. These have been extrapolated from both the insights and what was emphasized during the interviews.

4.1. Problem #1: Lack of quality in manufacturing

The case company has experienced that one of their clients did not live up to their expectations, when manufacturing a dining chair in regards to the manufacturing quality. The client really benefits from the service the case company provides, this is emphasized in how often they contact the case company with a new idea/trend/opportunity and how often they take advantage of the case company contacting them with a new design.

When the case company submits their design to their client, they are no longer in control of the product, including how it is manufactured. Even though the case company takes pleasure in making sure that the product’s aesthetics fit their standards of quality, and they have many products in their shared portfolio, the quality does not always live up to the case company’s high expectations. This includes both the materials used and the craftsmanship during production. As one partner of the case company puts it; ‘’and personally we both care about it being sustainable and long lasting, but we also have a business to run. This means we sometimes have clients that maybe do not care that much about it. With those it is about selling as much as possible.” This is a result of them producing their items at very low cost to meet customer demands. The case company does not have a saying in the manufacturing process for this client and the only thing they can do then, in terms of longevity, is to try their hardest to make the products visually pleasing and ensure that it looks like something that you would like to keep for years to come. These types of clients are nevertheless highly valuable as they provide a fair amount of the case company’s income.

It can also be difficult for the case company to know in which quality their products are manufactured by new clients. They can try to determine it from that company’s portfolio, but all products are different. One partner at the case company also pointed out “Well, you have that when your name is put on [the product/design], then everything has to work. But all we can do is to trust that they can manage it. And if you do not think that they can do that then you can pull out of it, but it will take a lot for someone to do that. Also because then the design is lost.” which furthermore explains how it can be difficult for them to choose which potential clients they want to work for. In a worst-case scenario, the client’s vision, for manufacturing longevity, is so far from that of the case company that they do not want to be stated as the designers of the product, and do not include it in their portfolio.

4.2. Problem #2: Price overshadows longevity

From different clients the case company has experienced the price of the final product to overshadow their personal visions for longevity. Often, it seems like the competition on price is so violent, that it overshadows the sustainable aspects of a product, if longevity is not a core part of their client’s vision. Even though the case company sometimes gets the chance to affect their client’s value chain, they still end in a position, where they do not have any power over their product proposal when it is handed over to their client. Then the longevity of the product might get deprioritized for the sake of cost.

At one point the case company had a client that wanted to expand their portfolio with a lounge chair, and during this process, the case company helped build a supply chain with manufacturers that met the quality demand of the case company. The client was okay with having a more expensive product at the benefit of producing a higher quality product with better materials and craftsmanship. That being said,

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after finding the suppliers, the case company cannot control and monitor the quality concurrently afterwards as it is out of their hands and completely up to their client to ensure a satisfying quality. So, in this case they were included in establishing a supply chain that followed their own beliefs up to a certain point. This means that they were able to push their own agenda a bit on their client, but after the supplier had been found and the quality of the product had been decided, the case company were once again bystanders, hoping for the client to keep up the quality of their product, and not giving into cheaper low-quality manufacturing.

One of the case company partners pointed out that there is a critical price point where the competition gets even harder; "From what you hear, there is a huge fight around pricing. It is important, as an example, that a chair gets down to a certain price point if it needs to sell. And that sort of speaks against the other thing [sustainability]. Also because when you get up to a certain price range then you are going head to head with all the design classics." Clients who are willing to pay the price for making long lasting products are hard to get a hold of as they are few and selective in the design process. They also reach a price point where they compete with furniture classics, which set even higher demands and expectations for the concepts.

4.3. Problem #3: Misalignment in the case company and their clients' visions

Getting new clients that follow your own visions can be difficult, which is why the case company sometimes works with clients that do not follow their understanding of responsible design, to gain funds to be financially stable. Working with that kind of client can result in the final product not living up to the case company's expectations of manufacturing quality and price point.

If the case company tries to suggest a product design that is too far from their client's vision, but fits their own, they might trash the project all together. On the other hand, if the suggested product design only fits their client's vision, and not their own, they will have to compromise on what they believe is the right way of making products.

This became apparent as the case company tried to sell what seemed like a solid concept, a modular couch with a sustainable mindset, that was meant to last for decades while also being repairable. The idea that underlined the concept, may have been too novel for this client though, as it became apparent that what the case company had created was not in the vision of the client at the given time and that it seemed too innovative, i.e. a difficult concept to sell as it did not seem to be inside of this specific clients comfort zone. This client already spends a great amount of time and resources on establishing their current supply chain and it is therefore very difficult to change their business strategy to produce longer lasting products. One partner at the case company put it like this; "Yes, but also because they have become more conscious of their own story. And their identity. And that they have to signal that they want to. To think about the environment, whether it is having long lasting products, if they are bringing good solutions, or if they are doing something else, then they need to have designers with the same mindset who tell the same story. So their vision for how they want to be perceived goes all the way to even the smallest part. So it is not only whether or not you have a good design."

It is also seen when the case company makes what might be a good concept but cannot find the right client to work with. In the following quote, one of the case company partners talks about a client that cancelled their collaboration as they were working on a new concept together. "and they have now figured out that that is not the road they are going to take. E.g., it is better for them that they have a few [product] ranges, something that works and then they go with that, because it is much more sustainable for them, and their users would much rather have just that. You do not want to give DKK 20,000 for a product where you are not completely sure if it is a need you have or you will get tired of looking at it. So now they have gone down that road as well."

5. Discussion and Implications

In trying to combat fast living trends, this study suggests that, for design consultancies there lies a barrier which is out of their hands, as the products they are deemed to design does not necessarily fit into what they might think of as a shared responsibility. This can be explained by their clients having another approach and mindset for their business. The vision of the design consultancies is undermined in the users demand and corporations and manufacturers' attempt to supply for these needs.

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The case company expressed some specific challenges, considering manufacturing quality, supply chain, and vision, when they were unfolding the cases. They did, for example, describe how they, as a design consultancy company, can influence the longevity of the designs they are producing, but that only counts for the aesthetics, and to some degree the material choses, of the design and not the overall sturdiness, durability and quality of the materials (Burns 2016, Frahm et al. 2021). Their clients have a value chain of their own, where the case company is only a small part, and therefore does not have much of a say in changing some links of the chain, like for example production. This relates to the value chain model by Flores et al., where the client already has an established value chain that the case company is a part of (Flores Ituarte, I., 2016). It can be considered both a development barrier and a business barrier, since one part is about the case company developing a product that can be long-lasting in the given value chain. The other regards their client and their will/ability to produce long lasting products. Changing a product to be long lasting will in most cases require sustained effort along with a big financial investment in the product's future no matter the motivation for the shift (Küçüksayraç 2015).

Both the industrial design industry and the research on the matter, has the recent years had an increased focus on its environmental impact, concluding that industrial designers can among others, contribute to the circular economy by designing for a circular consumption behavior (Dam et al. 2020).

Analyzing the case studies, it becomes apparent that the problem for the case company is that it is not always the clients who share a similar vision that contacts them to do a design, which might create a gap between the case company and what products they conceptualize. This combined with the fact that whenever the case company works for a company with their own established value chain, it leaves the case company's values and visions out of their overall value chain, meaning the case company will have very little influence as they are not an integral part. As Lee describes, visions are a part of a design company (Lee, J., 2018), and it is difficult to oppose one's vision. It can therefore be difficult to implement the visions of both companies when designing a new product. It is up to the case company to adjust to their client's vision when designing a product concept for them. This can be considered a development barrier. For the case company to be able to propose a long-lasting product, both in aesthetics and durability, and at the same time being sure that the final launched product is long lasting too, they have to get clients that have a fitting value chain. That value chain shall fit in both production opportunities, visions for longevity, and the right customer group, among others. Even though these clients exist, they are very difficult to get a hold of. Clients that focus on sustainability have very high demands when it comes to how sustainable their suppliers/partners are, and its therefore essential to have sustainability as a part of your image, to get considered as a supplier/partner. For the case company that would mean a total reorganization of their company.

The Redesigned Value chain (Lee, J., 2018) also suggests that the vision is a big part of a designer's business and thereby one of their tools to make money. Although this paper has found that a design consultancy's own visions can be diminished in an effort to gain clients and deliver products. Even though this study is only supported by a small amount of data, it could point to that designers are withholding from following their own visions and supplying long lasting products as they are 'forced' to work with other companies that might not have the same beliefs as themselves. This is actually undermined in reality and might limit a lot of designers from designing long lasting products.

The correlation between the discussion about misalignment in vision between the design consultancy and their clients, and the three specific problems, is how difficult it is for a design consultancy to become an integrated part of their client's supply chain. It can be stated as a barrier: As a design consultancy it can be difficult to make long lasting products, because you have to fit your designs to your client's business.

The outcome of this study suggests an additional collaboration barrier to the model found in Jensen et al.'s article (Jensen, P. et al., 2021). The cooperation barriers is an overall group trying to embrace all the barriers that might be present when one company has to cooperate with another company, to make a physical product. The shift in project responsibility in the relationship between a design consultancy and their client, is an example hereof.The three specific problems, the design consultancy faced, would fall under the cooperation barrier group, that is defined by dilemmas rising, when two companies, both responsible for different parts of a value chain (Flores Ituarte, I., 2016), are sharing responsibility for a

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product/ project. This covers both the dilemmas the design consultancies are facing, the dilemmas the clients are facing, and dilemmas others sharing the same value chain might face.

The cooperation barrier group can be unfolded and described with the three problems: Lack of quality in manufacturing, Price overshadows longevity, and Misalignment in the case company and their client's business. The first and often seen problem; Lack of quality in manufacturing, is a commonly seen way to cut prices, but does often result in reduction of product longevity. If a design consultancy would have to deal with this, it would crave a strong relationship or cooperation between them and their client, where they could push their agenda of long-lasting products, without it falling through. The same is true when dealing with product price that overshines the quality and longevity of a product. To find a product solution that could be both long living and have a small enough price point, a strong cooperation between the two parts is crucial. This strong cooperation would also give better chances for the two businesses to align their visions for the products or give one the chance to push their vision.

There might be even more factors incorporated in this barrier group, the three mentioned are just the ones safe to mention from the data set in this paper. They can conclude that there is an indication of a new barrier group: the cooperation barriers.

The new barrier group discussed in this paper, may not be fully defined yet through this research, as the case-study only represents a very small collection of data, based on two interviews in the same company. To verify the data, further studies and more extensive research has to be conducted. This would entail performing similar surveys within a larger group of design consultancies. This way, more interviews could be carried out as well as more cases examined, and as such, it would significantly expand upon the amount of data on which to base an even deeper analysis. Another important research aspect would be to carry out the same kind of research throughout the entire value chain. This would enlighten the issues and barriers from all angles and add a whole other level of complexity to the dataset.

At this point, the possible barrier within the new barrier group have really only been researched within the furniture and home goods industry, however, it would be relevant to look into other fields of design, such as electronics, food production, consumables etc., to see if the same principles would still be present. This is particularly important since it would provide needed knowledge into which product categories the new barrier group would be applicable to.

Finally, an investigation into possible problem solutions would provide input usable to everyone in the value chain who wishes to overcome barriers such as this one. Something like this would most likely not serve as a definitive solution, but more of a guideline on how to navigate barriers within cooperation.

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