Retail Design in the Transition to Circular Economy: A study of barriers and drivers

Research shows that much of the blame for waste and lost resources can be traced to the design phase. The implementation of Circular Economy (CE) has the potential to reduce waste by encouraging reuse of resources in a closed loop. Given that designers are involved in the design process, this paper investigates whether they are properly equipped to take responsibility for the shift toward CE. A group of professional designers from the field of retail design were therefore interviewed, with a view to discovering and understanding impediments to the implementation of CE; the study presents a snapshot of these designers' knowledge of CE. It identifies categories of drivers and barriers to CE, as seen from the designer's perspective; shows conflicting interests within these categories; describes the interaction of collaborators; and, finally, suggests roles that each of these players might be expected to play in an eventual transition to CE. Findings suggest that while designers understand their responsibility in accomplishing this transition, they lack tools and confidence to engage in the recycling process. Despite being enthusiastic about CE and recognizing the need for change, they do not reckon themselves capable of leading that transition.

Keywords: Circular Economy; Green Marketing; Retail and hospitality design; Designer Role; Collaborators; Ecosystem.

1. Introduction

As a component in a more comprehensive retail and hospitality marketing strategy, store design is considered a mechanism for attracting and inspiring consumers (Kent and Petermans, 2017; Turley and Chebat, 2002). But this arrangement engenders a concomitant need for stores to renew themselves continually in order to maintain their relevance for consumers. This results in a constant

demand for energy and raw materials to produce the next generation of stores. The life cycles of store interiors are typically from 2 to 10 years, depending on the type of store and the pace of change in trends (Fieldson and Rai, 2009; Kent and Petermans, 2017). The linear economic model, with its take-make-use-dispose paradigm, further exacerbates the situation, since the removal of old interiors results in massive amounts of waste. For all these reasons, the need for companies to start practicing sustainable marketing strategies has recently come to the forefront. One researcher has articulated the imperative for green marketing and related practices, describing the need for a *"holistic management process responsible for identifying, anticipating and satisfying the requirements of customers and society in a profitable and sustainable way"* (Awan, 2011). Implementation of circular economy (CE) relies on holistic management processes from within commercial and industrial ecosystems (Borland and Lindgreen, 2013; Konietzko et al., 2020), and is intended to go beyond environmental responsibility practices such as green selling, environmental reporting and stewardship for environmental responsibility (Bocken et al., 2016; Leonidou et al., 2013).

The European Commission has noted that 80 percent of the environmental impact of products and services is determined in the design phase (European Commission, 2018). CE is a concept in business practice. It enables firms to reduce waste and minimize consumption of natural resources, thereby mitigating environmental impacts, by changing the take-make-use-dispose paradigm to a practice that keeps materials in closed loops (Ellen MacArthur Foundation, 2013). Consensus exists among academics and policy makers that significant innovation will be required for meaningful implementation of CE (De Los Rios and Charnley, 2016; Dokter et al., 2021; European Commission, 2018). Since the designer's job—including idea generation and convincing stakeholders to carry out their ideas—takes place at the initial phase of any process of innovation, designers are in a unique position to effect change in this area.

Existing research shows that design professionals are uncertain about the role they should play in meeting the challenges of a transition to CE (Dokter et al., 2021; Ruiz-Pastor et al., 2021; Sumter et al., 2020). Despite being able to recognize the need for their participation, they feel ill-equipped to meet these challenges. Although different approaches to thinking about and implementing CE have been proposed (Bocken et al., 2016; den Hollander et al., 2017; Ellen MacArthur Foundation, 2015a; Ideo and Ellen MacArthur Foundation, 2018; Mestre and Cooper, 2017; Moreno et al., 2016; Nußholz, 2018), these are typically theoretical or conceptual in their approach. Few are based on empirical data, and even fewer have taken the perspective of the designer, resulting in the fact that the perspective of the designer's role in CE is underrepresented in academic literature (Dokter et al., 2021; Sumter et al., 2020). The few studies that have taken the designer's perspective have focused

on product designers and architects (Bocken et al., 2016; Dokter et al., 2021; Shahbazi and Jönbrink, 2020). Retail design practice based on CE principles has not yet received any attention in research. This indicates a gap in theory and practice that needs attention.

In order to establish a thorough understanding of the designer's potential role, this study attempts to identify impediments to retail designer's practice in a transition to CE. This is accomplished by mapping drivers and barriers into a framework, and by identifying the various collaborators within the ecosystem specific to retail design, along with their individual roles. This research contributes to existing theory and practice by outlining the role of designers in transitioning towards CE. The study asks: *Which factors constitute opportunities and challenges for retail designers in the transition to CE?* Additionally, the study attempts to categorize drivers and barriers to CE within the ecosystem of retail design, and proposes a framework for understanding the role of the designer and the expected roles of collaborators within the categories as so defined. This framework is intended for use in the field of retail design, but it could certainly prove useful in other design fields as well.

The paper is structured as follows: first, the concept of CE and its relevance to design practice are introduced, first in general terms and then in the context of retail design. This is followed by a method section, which describes data collection and analysis. Findings are thereafter reported, beginning with those pertaining to the designer and to his/her practice within five identified categories—Cultural, Market, Regulatory, Knowledge and System—and continuing to those pertaining to the identified collaborators, relating these to the same five categories. This is followed by a discussion of theoretical and practical implications, and the limitations of the study. Finally, we offer concluding remarks and identify avenues for future research.

2. Literature review

2.1. Design practice and its potential for CE

Alhawari et al. (2021)provided an exhaustive definition of CE, outlining the need for understanding it as a set of organizational planning processes, and, importantly, viewing CE as an ecosystem with closed loops for all resource flows. Debate continues, however, over issues ranging from technical problems related to recycling (Ceschin and Gaziulusoy, 2016; Pheifer, 2017)to cultural skepticism and resistance to change (Kirchherr et al., 2018). As described by the Ellen MacArthur Foundation in 2013, CE takes a design and systems perspective, but the widely recognized and useful Butterfly Model does not indicate how designers' practice should be incorporated in the system. The specific role designers can play in eliminating waste and increasing reuse is described in diffuse terms in the

literature. Practical implementation of CE design processes remains in its early stages, and often overlooks the central role of designers (Dokter et al., 2021).

Transition to CE may well engender disruptions to existing business models and value chains, and it is therefore associated with risk (Linder, M. and Williander, 2017). Additionally, it is not feasible for any single company or individual actor to take initiative toward implementation of CE without the holistic view, given its systemic nature of CE (Reike et al., 2018). And yet individual action is still what is required. Since the designer's input always comes at the beginning of the process, it makes sense to investigate what role designers can play in this transition. To date, few studies have addressed the designer's ability to navigate these challenges (Sumter et al., 2020).

Yet design is not created in a vacuum. Design always emerges from the interactions of a network of interrelated collaborators. Findings suggest that successful implementation of CE in practice will require extensive collaboration between like-minded experts and partners throughout all stages of an innovation process (Dokter et al., 2021; Gong and Whelton, 2019). Having argued that designers can play an important role in the implementation of CE, few studies have addressed the designer's ability to navigate these challenges (Sumter et al., 2020) and the question remains: how?

Designers are often thought of as creative problem-solvers (Buchanan, 1992; Lawson, 2006; Schön, 1983). Nonetheless, some scholars have addressed designers' limitations in problem solving (Dorst, 2019; Harfield, 2007). Dorst (2019) describes the designer's work as pragmatic and formative, pointing out that an understanding of the cultural and political landscape requires a level of systematic thinking that is not necessarily a component of the typical design process. In other words, designers bring to the table a set of formal, aesthetic, and technical sensibilities, based on preferences, prejudices, and previous experience. When it comes to CE design practice, previous experiences are naturally limited, and empirically based studies are few in number (Dokter et al., 2021). Existing empirical studies have shown, for example, that design practitioners have diverging understandings of how to design for CE (Dokter et al., 2021), and that new design competencies are needed (Sumter et al., 2021, 2020). For example, Sumter et al. (2020) identify *CE Collaboration skills* as an important competency for designers, emphasizing that designers need to be able to identify, map, facilitate, and manage collaborations between external stakeholders in operationalizing a circular business model, and recently Sumter et al. (2021) identify *Circular System Thinking* as the ability to adopt an approach to design that regards CE as a complex system. These competencies, once they become widespread, can provide a foundation for changes in practice, and, in turn, lead to the establishment of new and more appropriate design methods.

2.2. CE in retail design

Just as the design of products and built environments has hitherto taken place under the linear economy's take-make-use-dispose paradigm (Dokter et al., 2021; Hart et al., 2019; Shahbazi and Jönbrink, 2020), the same holds true for the design of retail servicescapes. In fact, the challenges within the retail sector are even greater, since projects have a lifespan that can be as short as a few days and is normally no longer than a few years (Fieldson and Rai, 2009; James, 2006; Kent and Petermans, 2017; Zhao et al., 2015). This rapid turnover necessitates the production of large quantities of raw materials, while simultaneously producing many tons of waste (Kent and Petermans, 2017).

Designers working in this sector are thus compelled to navigate between two competing imperatives: the demand for fresh and attractive retail spaces on the one hand, and the accelerating need for companies to be seen as environmentally responsible actors on the other (Tucker, 2015). This tension—between the demand for fast-paced renewal and the negative environmental impacts thus generated—creates an opportunity for retail design to be proactive in the transition to CE, and provides motivation for revamping the design process. Stakeholders within the retail industry cannot turn a blind eye to the green market trends, and in order to stay more than visually attractive, they need to start seeing the design process as a component in a green marketing strategy (Awan, 2011).

Seen from the perspective provided by Awan et al. (2020), green marketing management practices and manufacturing processes are focused on minimizing the environmental footprint. Internal activities, such as planning and designing with an ecologically efficient mindset are essential for lowering environmental impact. According to these authors, the way to reach this ideal is to learn from practitioners. However, a literature search for best practice or practical contributions within the fields of 'retail design' and 'circular economy' revealed no studies on this topic, and our study is the first to address retail design practice in the transition to CE.

3. Method

Given the explorative nature of the study, a qualitative approach was deemed appropriate (Crotty, 1998). Allowing subjects to express thoughts and experiences in their own words provides insight into different ways of dealing with issues pertaining to sustainability in the context of a creative practice. Our focus is therefore on understanding designers' experiences within the context of their practice, as opposed to instances and frequency of a particular response (Gioia et al., 2013). Using an inductive approach (Glaser and Strauss, 1967), enables us to develop a theory about the

designer's role in the transition towards CE. Finally, the narrow focus on practices within the retail design sector provides an in-depth understanding of a specific design ecosystem.

3.1 Data collection

The study consists of 20 semi-structured individual interviews with professional retail designers. An interview guide was designed and tested prior to the interviews to enhance reliability (Yin, 2003) and to ensure that respondents would both be able to understand the topics in focus, and to express their thoughts and experiences in their own words. Topics in focus ranged from interactions with clients and suppliers to experiences with sustainability initiatives and environmental policy in a professional context.

Respondents met all of the following criteria: (1) they have earned a degree in design, retail design or architecture from an accredited institution; (2) they have at least four years of professional experience in retail design; (3) they work in full-time positions as retail designers either in a design studio, as in-house designers for a commercial brand, or as independent designers (Table 1). The professional network of one of the study's authors was utilized to identify the first several respondents, after which a snowballing technique was employed to increase the pool, using either LinkedIn or email to contact designers. The process was stopped when we reached a saturation point, where no new information was revealed. All respondents agreed to participate in the study voluntarily. In order to mitigate confirmation bias, the purpose of the study was not revealed in any detail during the recruiting process; respondents were told that we were interested in their design practice.

Table 1. Overview of participants.

#	Age	Gender	Organization	Field of Design Practice	Experience (years)
1	25-30	F	in-house	retail design	5
2	40-45	F	in-house	retail design	14
3	40-45	F	independent	retail and hospitality design	15
4	35-40	F	design studio	retail and hospitality design	13
5	45-50	F	design studio	retail and hospitality design	18
6	40-45	F	design studio	retail design	11
7	30-35	F	design studio	retail and wayfinding design	5
8	35-40	F	design studio	retail design	10

9	30-35	F	design studio	retail design	5
10	40-45	F	design studio	retail and hospitality design	13
11	40-45	M	design studio	retail and hospitality design	14
12	40-45	M	design studio	retail and hospitality design	16
13	50-55	M	design studio	retail and hospitality design	24
14	40-45	F	design studio	retail design	13
15	30-35	F	design studio	retail and hospitality design	5
16	40-45	M	independent	retail and hospitality design	12
17	50-55	F	in-house	retail and kitchen design	12
18	45-50	M	design studio	retail and hospitality design	30
19	25-30	M	in-house	retail and hospitality design	4
20	35-40	M	design studio	retail and hospitality design	12

All interviews were conducted via online meetings in the spring of 2020. With permission from participants, the interviews were digitally recorded, and transcribed to facilitate a structured coding process. In order to ascertain respondents' level of knowledge about CE, the interview sessions were divided in two parts. The first part began with general questions about sustainability and design practice, after which participants were asked whether they were familiar with the term Circular Economy. Participants were then asked to watch two short videos about CE (Ellen MacArthur Foundation, 2016, 2015b). These videos had been sent to participants shortly before the interview, so that they could log out of the call and watch them on their own computer. After watching the videos, the interview continued to the second part, with questions focused specifically on CE. In order to provide a framework for the discussion of the ecosystem of collaborators, respondents were introduced to a model depicting known collaborators in the retail design process (Münster and Haug, 2017). This model was shown to respondents from the researcher's computer using a share-screen function. Each interview lasted 40-60 minutes, including the 14 minutes spent on the information videos.

3.2 Data analysis

Data analysis consisted of two coding cycles. The first of these was to fracture and split the data in

individual coded themes. From this process 11 themes emerged. The second coding cycle was to reorganize, compare, and focus the codes to develop five overall categories (Figure 1), which serves as the foundation for the explication of the findings and results (Saldaña, 2013). In order to secure internal validity (Yin, 2003) the coding cycles used hermeneutics and cognitive mapping (Crotty, 1998) to funnel data and create categories that were further analyzed and interpreted. Using peer-review literature, layman reports, handbooks, and grey literature, the analysis triangulated findings to build a strong chain of evidence that help understand the context of designers' endeavor to embed CE principles in retail design.

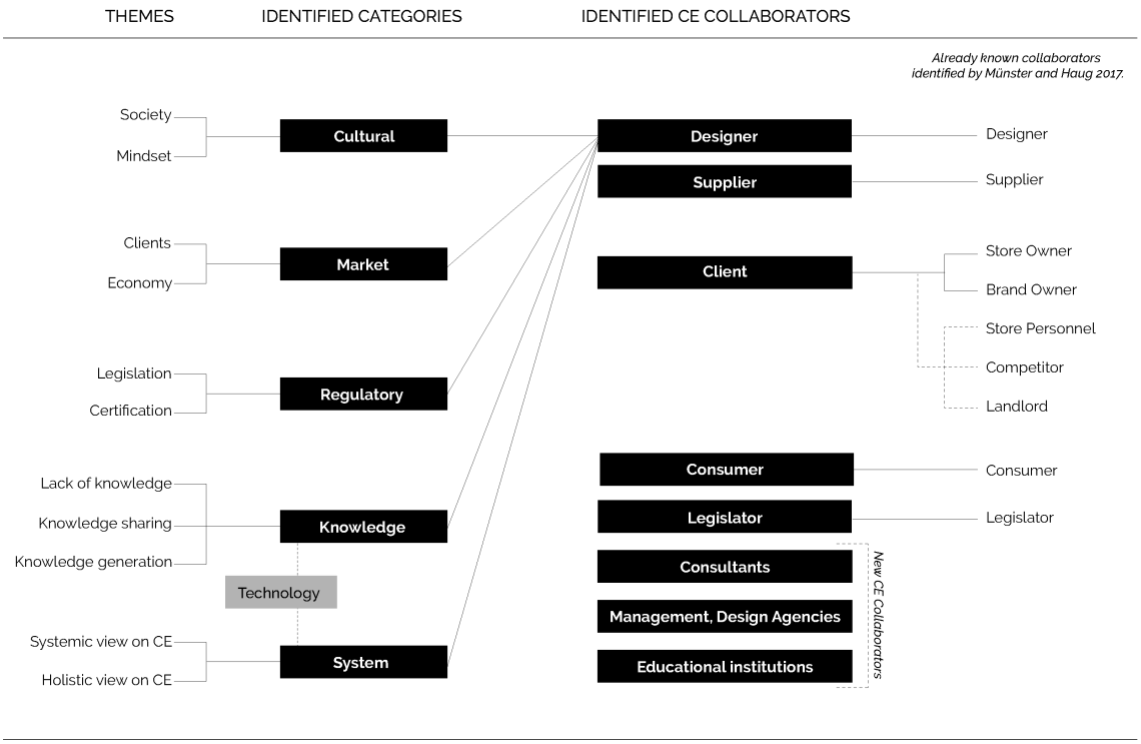

Figure 1. Overview of coding process.

4. Analysis and Findings

4.1. Identification of General Categories

Kirchherr et al. (2018) have established a framework for categorizing the various drivers and barriers to CE transformations; this framework was deployed as a starting point of the analysis. Kirchherr's framework identifies factors having an influence on CE transformations, and divides them into four

categories: Cultural, Market, Regulatory, and Technological. The first three categories were meaningful to this analysis, whereas the fourth category, dealing with technology, was not. None of the designers interviewed mentioned technological concerns relating to sustainability or CE, either explicitly or indirectly. This category was replaced by two additional categories: *Knowledge* and *System*. Issues falling under these two new categories were prevalent in the interviews. Thus, for the analysis presented in Table 2, the following five categories were used, and are defined as follows:

1. ***Cultural*:** issues comprising barriers/drivers related to society and mindset/attitudes.
2. ***Market***: issues comprising barriers/drivers related to clients and economy.
3. ***Regulatory*:** issues comprising barriers/drivers related to legislation and certifications.
4. ***Knowledge*:** issues comprising barriers/drivers related to lack of knowledge, knowledge generation, and knowledge sharing.
5. ***System*:** issues comprising barriers/drivers related to a systemic or holistic view of CE.

The following sections summarize barriers and drivers identified by the retail designers and organize them within these five categories.

4.2. *Cultural* Barriers and Drivers

Respondents were generally enthusiastic about learning about CE and its principles and were apt to consider it a new tool in the designer's toolbox. Generally, they were positively disposed to the prospect of considering the reuse and recovery of materials early in the design process, using phrases such as *"Of course we should base our society on circular practices, that makes perfect sense."* Respondents had no trouble accepting the idea that their design solutions would be based on materials coming from and destined for a pool of recycled materials. Even without previous experience with CE principles, they generally answered with agreement and without hesitation, saying things like *"I think it's obvious that that's where we need to go, where we integrate these solutions already on the drawing board."*

A common reaction to the take-back philosophy in CE is represented by this response: *"I think that's a really good idea, and it requires that we choose the right materials from the beginning."* To the question of whether a requirement of circularity would impose limits on the designer's creativity,

designers generally saw it as an opportunity, saying for example *"As a designer we are always faced with limitations of one kind or another, so I would just look at it as an opportunity for growth."*

None of the respondents expressed concern that employing CE principles would have a negative impact on their creativity or professional development. On the contrary, they viewed the constraints as drivers for creativity.

But after this enthusiastic talk about the concept of CE and their own creativity, which designers seem passionate about bringing to the table, the discussion often took a turn for the worse. Respondents mention several situations that illustrate a conflict between their own opinions and the requirements of the market. Respondents did not see themselves as being in a position to revolutionize the design process. While it is true that the designer proposes an idea, respondents felt that the demand for changes of the magnitude required for transition to CE would need to come from elsewhere. Respondents mention consumer demand as a possible driving force, noting that as consumers become more aware of environmental impacts, they will put pressure on brand-owners to take action to ameliorate some of these impacts. Brands will in turn pressure design agencies, which will then create a demand for designers with competencies related to CE. *"Ideally it would be consumers who pressure the money into doing this,"* as one respondent put it.

4.3. *Market* barriers/drivers

Among retail designers' chief concerns is to have a sense for the market and its current trends. Their designs exist to create experiences for consumers, and their jobs depend on being able to create and maintain market share for their clients. Whether or not implementation of CE can maintain or increase market share is seen by respondents as a decision that lies with others than themselves. This position was clearly represented in the interviews. One respondent said, for example, *"as a designer working directly for a brand owner, I think the owner would need to make that decision."*

Since it is the client who pays the bills, economy is both a driver and a barrier to CE. *"You can't talk about environment without talking about money,"* was a response illustrating this point of view. Designers are completely dependent on market economics, and designers are beholden to the demands of their clients. Clients engage designers and design firms to solve marketing issues for them; without them, design as a profession would not exist. Despite acknowledging this circumstance, some of the designers who had worked many years in the field allowed that it might not be fair to use the client and the demands of the market as an excuse for avoiding change. For example, one respondent said, *"The financial aspect is important for our customers, so I sometimes*

use that as an excuse [for not considering sustainability in projects]*, because I have been worried about how to approach sustainability."*

A number of designers noted their guilty conscience over the high level of resource consumption and waste production associated with their own work. For example, one respondent said, *"I feel bad about working in a profession where there is so little focus on sustainability."* Another said, *"I would really like to be able to have a cleaner conscience about my work."* Several respondents indicated that working with CE could help to ease their minds about the effect their own work has on the environment. One said that *"I think personally, I would be a lot happier with my own product if circularity were built in."*

This cognitive dissonance that respondents describe is the result of a clash between two of our categories, *Culture* and *Market*. In other words, a designer's personal interests come into direct conflict with those of the market economy. At first glance this might be considered as a barrier to the designer's work. From another perspective, however, the desire to resolve this conflict can be considered a driver. As one respondent said, "*For a long time, I have wanted to incorporate sustainability into my own work, I just need to find an employer who feels the same way,"* indicating a willingness to go as far as changing jobs to work for a company willing to take sustainability seriously.

4.4. *Regulatory* barriers/drivers

Respondents agreed that changing legislation is the place to start if a transition to CE is to get off the ground quickly. As one respondent put it, *"If you change laws, you can accomplish a lot."* Respondents saw legislative changes as a means for ensuring a level playing field among market competitors. Exactly what should be regulated and how, on the other hand, was less clear, but the general desire for consistent regulations was evident. *"We need to make sure that there are rules, in order to ensure an adequate level of compliance,"* as one respondent put it.

Respondents viewed legislative change as more of a kick-starter than an actual driver. Several interviewees expressed the belief that if the process is not initiated with legislative change, it will take much longer for the market to self-regulate the flow of materials and utilization of resources. As one respondent put it, *"It is certainly possible without changing laws, it will just take 300 years."* From the perspective of design professionals, CE will not get off the ground without the help of legislation.

4.5. *Knowledge* barriers/drivers

In the first part of the interview, respondents were asked to explain how they understand the term 'sustainability.' The most common responses were of two types: (1) reduction and reuse of materials; and (2) design that lasts longer. The concept of a return flow, or incorporating that flow into a design, was not a component of respondents' understanding of sustainability. Respondents readily acknowledged their lack of knowledge about CE and the philosophy behind it. When asked directly about their knowledge of CE, only a few were able to explain the concept in very general terms, and these descriptions contained elements indicating uncertainty. *"That's where you take the product's whole life cycle in, so you can just start at the beginning on the other end, right?"* was a representative response. Knowledge of practical application, or of how CE might be implemented into a design practice was essentially non-existent.

None of the designers interviewed had considered circularity in any of their previous projects. Assuming that respondents in the study are a representative sample, lack of knowledge about how to approach this can be considered a key barrier. All of the designers interviewed considered lack of knowledge as the most important barrier to implementing CE in their design practice. *"I don't know how to tackle this. I just don't know what to do,"* as one respondent put it.

In addition, respondents mentioned that they had been introduced to materials and products that were marketed as sustainable. But without being able to verify this claim, they were hesitant to incorporate these materials in their projects. One respondent said, *"We're nervous about sticking our necks out if we can't go all the way."* At the same time, some respondents mentioned that a lack of know-how should not be an excuse for doing nothing at all. For example, *"One of my clients said that it was better to do a little than not to do anything, but I was worried about it."* Another respondent said, *"one of my customers has requested sustainable materials, but I just don't know enough about them."*

Respondents expressed being aware of how to find knowledge about materials, for example, mentioning the internet or suppliers as possible sources of information. But the lack of concrete knowledge—knowledge connected to actual, practical experience—creates uncertainty and therefore can also be considered a barrier. One respondent said, *"Of course I look for information, and a lot of companies are marketing sustainable materials now, but there is also a lot of greenwashing, so I am afraid of using recycled materials right now."*

4.6. *System* barriers/drivers

But it is not only knowledge about materials that designers lack. Respondents also point to the lack of systems for handling materials both before and after their use in a project. System-thinking is a central issue in CE (Sumter et al., 2021; Webster, 2015), so it's not surprising that respondents bring this up. As one respondent said, *"It doesn't make any sense for one designer or one design studio to work with circular economy by itself. The whole system has to support it if it's going to work."*

Here once again, respondents indicate the necessity of action from others than themselves in order to establish and secure circularity systematically. As one respondent said, *"We need to have suppliers who are also thinking circularly."* Respondents viewed their own position as peripheral to existing networks, where systems are already in place. Agreements are often already in place between customers and suppliers within a certain geographic area, for example. *"We don't own the stores, so the question is often completely out of our hands,"* as one respondent said. It is especially suppliers who are seen as the key to ensuring circularity, since they must both provide reusable materials and receive them once again after use.

4.7. Identification of Collaborators

Implementation of CE will require new levels of cooperation between the various partners in the design and building process (Gong and Whelton, 2019; Sumter et al., 2020; Webster, 2015). This study delineates the roles of these collaborators as designers see them, in the case of retail and hospitality design. The model by Münster and Haug (2017), presented to interviewees for the purpose of discussion depicts nine different stakeholders in the retail design process: *Designer, Supplier, Store Owner, Brand Owner, Store Personnel, Consumer, Landlord, Legislator,* and *Competitor*. Based on the discussions that occurred in our interviews, we have adjusted the list of CE collaborators to: *Designer, Supplier, Client, Consumer, Legislator, Management in Design Agencies, Consultants, and Educational Institutions,* presented in Fig. 1.

In the main, respondents referred to *Brand Owner* as '*Client*'; we have therefore adopted this designation. Münster and Haug (2017) define *Store Owners* as owners of franchises in chain enterprises; respondents did not feel this was a relevant designation to the CE discussion, since the Brand Owner would determine the store's design concept. For these reasons, the terms *Store Owner* and *Brand Owner* are conflated to '*Client*.' Apart from *Client*, interviewees identified *Designer, Supplier, Consumer, and Legislator* as collaborators important to the discussion of CE from the existing model, Figure 1.

Despite the fact that respondents did not mention themselves, *Designer*, directly in their assessment of relevant stakeholders, there are clear examples in the interviews indicating that they see themselves having an influence on the process. For example, one respondent said, *"We need to be armed with a lot more knowledge on the subject, if we are going to be able to give good advice to clients."*

Store Personnel and *Landlords* were not considered relevant stakeholders to CE transition. Respondents mention *Competitors* in a few instances, but then clarify that *Competitors* would not be direct actors in the process, but rather actors with the potential to indirectly influence their clients through branding, standpoints and the like. We consider the influence of *Store Personnel, Landlord and Competitors* to be included in the client's considerations and have therefore not included it in our analysis.

Respondents also indicated other collaborators who might play a significant role in CE transition. Interviewees see their own management, *Design Agencies*, as being able to facilitate changes, though they are less than clear about how. *CE Consultants* and *Educational Institutions* are also mentioned as actors capable of having a significant influence. In total, respondents identify eight distinct groups of collaborative partners who they see as being able to play an important role in CE transition. These are presented in Fig. 1 together with the five categories of drivers and barriers.

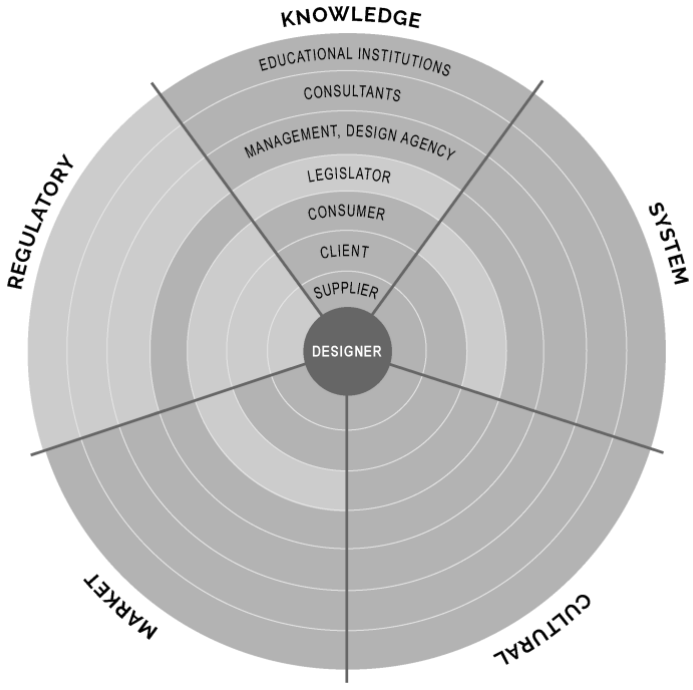

Fig 2. The model shows the intersection of the five categories with each of the identified collaborative partners. The dark grey fields are intersections which respondents touched upon in the interviews.

Placing the five categories of drivers and barriers in relation to each of the collaborative partners, we can get an overview of what designers see as the challenges and impediments to implementation of CE (Fig. 2). Based on our analysis of the interviews, concluding remarks and selected quotes are presented in Table 2. For each intersection between category and actor, we have provided a concluding remark and attached a quotation that typifies how respondents expressed themselves on the subject. Researchers in other fields can find inspiration in this framework, but it is important to remember that both categories and collaborators will vary from field to field.

Table 2. The table shows the intersection of the five categories with each of the identified collaborative partners. Each intersection that produced information contains a summarizing remark, followed by a typifying quotation from the interviews.

	Cultural	*Market*	*Regulatory*	*Knowledge*	*System*
Supplier	Suppliers will need to adapt to the changing mindset and attitudes of their clients and the designers with whom they cooperate.	Suppliers provide products and services for the market and will therefore adapt their products and services to the demand.		Suppliers have a responsibility to inform designers about their products and materials and guarantee their circularity.	Suppliers are expected to provide knowledge about how production of materials can become circular and facilitate creation of take-back facilities.
	"We will have to choose suppliers who are willing to cooperate on this. I can imagine that some suppliers will just say 'sorry, we don't do that.' It would be great to make a pilot project with some suppliers who are enthusiastic and want to participate."	*"If you have a brand owner who says, 'this is how we are going to do it,' then you will have to find a supplier who is willing to play along. The decision-makers will have to be the key here."*		*"They would need to give us knowledge about the materials and ensure that they can go back into the system."*	*"Our suppliers are simply going to have to do this. They will have to deliver, pick up, recycle and so on. We need the supplier to be more process-oriented, all of a sudden it's very important."*
Client	Clients will need to adapt to the mindsets and attitudes of their consumers.	The client is in the market to earn a profit. Clients are influenced by how consumers spend their money.		The client does not necessarily need to contribute knowledge of CE; he or she must rely on designers and suppliers, that their knowledge is both complete and correct, and does not entail significant increase in costs.	Clients will need to understand the monetary and environmental values of a circular material flow.
	"If consumer demand is high enough, brand owners will listen."	*"Money is always going to be the biggest roadblock. I have probably designed 5000 stores, and I can't remember a single time where budget was not a limiting factor."*		*"One of my customers says that it's better to do something than nothing at all, but I have been nervous about it."*	*"If I can convince my client that he or she can sell the materials again when it's time, then it makes a lot of sense."*

Consumer	Consumers can use their spending to put pressure on brands and legislators.	The more consumers know about the environmental impact of design, the more they are expected to influence the market with their spending.			
	"If consumers demand it, both legislators and brands will listen."	*"If it's not marketed to consumers, they will never demand it."*			
Legislator	Politicians are responsible for living up to climate-related laws and agreements. They will also be receptive to the interests and demands of voters and business interests.	Politicians need to defer to the market to some extent, but they also have the power to force the market to comply.	Politicians and legislators should make rules that both smooth out the transition and spread the burden equally.		Legislators need to make informed decisions based on a clear foundation, and they are therefore dependent on the knowledge that both suppliers and producers bring to the table in order to create systems for CE.
	"Brand owners are not likely to do anything, if there are no laws and no demand from consumers."	*"If your building permit requires that your design is circular, then I think we will see some action."*	*"If we really want to get this going, it will need to be with legislation. We need laws that simplify the process and tell everyone what they need to live up to."*		*"It makes no sense for single designers or design studios to work with CE, it needs to be backed up by the entire system."*
Management, Design Agency	The attitudes of both clients and designers can put pressure on design agencies to adapt their business practices. Or, design agencies can decide to use CE to create new business strategies.	Design agencies are susceptible to market pressures, but they are also big enough to be able to utilize market forces to create market share. They can also use CE in this way.		If individual designers are not prepared to advise and guide clients with respect to CE, then design agencies will not be able to drive the transition. Managers within design agencies can decide to focus on CE, placing a focus on education and generation of knowledge within their businesses.	Design agencies with established clients and suppliers can develop their businesses by offering a service that handles reuse and recycling of materials.
	"I have wanted for a long time to incorporate sustainable principles into my work, I just need to find an employer who will back me up."	*"We also need to look at our business model. We earn money selling furniture and fixtures, but it's also imaginable that we could rent them out instead, so that we earn money on the design rather than on the furniture. If we tell customers that they shouldn't change the furniture as often, we will be undermining our own business."*		*As a firm, maybe we should consider offering to remove furniture as a part of our services when we renovate a store. Economically it would be difficult to implement, but often there's nothing wrong with the materials at all, especially steel, and it can easily be reused.*	*It makes no sense for single designers or design studios to work with CE, it needs to be backed up by the entire system.*

Consultants	Cultural changes can create opportunities for new businesses, such as consultants and experts capable of advising designers in the transition to CE.	Consultants with specialized knowledge of CE could be the link between the market and design agencies, giving them the potential to create new market share.		Consultants are dependent upon the existent knowledge level of the market and academia.	New businesses can be created by addressing the life cycle of products from start to finish.
	"It would be great if we were better at sharing the knowledge and experience that each of us has, that there were more heads put together from the start of the process."	*"If we as a design agency hired a CE consultant, we would be in a position to give good advice to our clients."*		*"I would really like to be able to find someone who knows a lot about this, so that we could hire them as a consultant."*	*"I can see possibilities for someone who worked with this for a long time and then creates some kind of a library or a storehouse of materials that designers can use for the creation of new projects".*
Educational Institutions	Universities and Design Schools will need to adopt the new circular approach in order to provide the knowledge needed for the CE transition.	Schools have the responsibility to educate designers, those already working and those yet to begin their careers.		Educational Institutions need to accumulate and disseminate practical and academic knowledge about CE.	Effective systems for implementing CE need to be researched, developed, and tested in academic institutions.
	"I know that this approach is being taught today, and maybe it's just my prejudices, but sometimes the whole thing seems a bit home-made and organic supermarket like. We need to make it more cool, to build more value into it somehow."	*"It's all about information. People need to be educated about this. It's fine to have good intentions, and everyone would like to help out, but things need to be put in place so that this can work."*		*"This requires a lot of knowledge, I don't know how much of this they are teaching at the design schools today."*	*"Personally, I think I would not know how to deal with [recycling of] screens and electronics, for example, but I think I am fairly well equipped as far as furniture and fixtures are concerned, even though I could use a refresher course in reusability, especially if that is going to become a requirement."*

5. Discussion

5.1. Practical implications

Results from this study show that there is willingness among retail designers to innovate, and to adapt to the principles of CE. In short, designers are enthusiastic about CE, seeing in it an opportunity to make their own designs greener and more sustainable, and a way to reduce the oversize environmental footprint of their industry, thereby easing their consciences. Yet it is difficult

for them to visualize their role in this complicated and radical transformation, which requires changes in both mindset and practice from a broad range of actors.

Respondents expressed willingness to take an active role in the transition and see their creative abilities as a strength that can and should be utilized. But they also expressed lack of knowledge and support from collaborative partners, and they do not feel equipped to drive the transition to CE. Finally, designers call for a system able to handle materials from one end of the process to the other, and a system for distributing responsibility between the various partners in the process.

Designers make their living creating new designs that satisfy their clients and ultimately customers. The emergence of green marketing, as well as the generally accepted imperative for more sustainable business practices that is so prevalent in our societies today, these factors might explain why the designers we interviewed see CE as an opportunity to keep designing new products and at the same time reduce negative impacts on the environment, doing their part to mitigate climate change. Precisely this idea—that CE can engender creativity while at the same time addressing environmental challenges—seems to be attractive to designers.

5.2. Theoretical implications

Dorst (2019) and Harfield (2007) raise concerns that designers' role as form-givers in fact precludes the systematic thinking required for participation in a CE transition. We must both agree and disagree. Yes, the interviews indicate mechanisms inherent to the design profession that hamper designers' participation as leaders. Respondents point out barriers to CE that are beyond their own reach (for example, the changing of legislation to level the playing field) and emphasize the fact that they are subject to client and consumer preferences.

And yet the answer must also be no. Despite the fact that designs must be realized through available means, and that products must function in the physical world, designers do not view the challenges presented by a circular economy transition as a hindrance to either their creativity or the quality of their output. With knowledge and training, designers can be better equipped for the challenges they might face in CE, but the system that is essential must be built up between the partners in the professional network. Not only as a system to handle physical materials, but a system that can embrace a new way of thinking. In short, the central role design can play in a transition to CE needs to be articulated, practiced, and broadcast in much greater detail, and new theoretical contributions should be able to be gleaned from the expertise, trust, and mutual respect that exists between professional collaborators.

5.3. Limitations

A single-case research design is vulnerable to criticism. It would therefore be appropriate to replicate the study in similar contexts to substantiate conclusions (Yin, 2003). Findings from this study are the first insights into retail designers' role in an eventual transition to CE. The study can therefore be considered the foundation upon which future research can build. A further limitation is the geographical context of Denmark, which might be seen as a too narrow a foundation for the theoretical implications we assert. However, given that Denmark is widely considered a frontrunner in sustainable development practices and technology (SDG Index, 2021) and has a well-documented history of leadership in design and architecture (Bason and Austin, 2019), the specificity of this particular geographical context can also be seen as a strength.

6. Conclusion and further research

In an attempt to understand how and why retail designers struggle with challenges associated with green marketing and the transformation to CE, this study has classified the issues raised by respondents into five categories: *Culture, Market, Legislation, Knowledge, and System*. Additionally, we have identified the collaborative partners that retail designers expect to play a role in a transition to CE: *Supplier, Client, Consumer, Legislator, Design Agency, Consultant and Educational Institutions,* and finally we provide an outline for how retail designers expect each collaborator in the ecosystem to contribute to a successful transition to CE. Collation of this information sheds light on the relationship between designers and their collaborators in each of the aforementioned categories.

Whereas previous studies (Dokter et al., 2021; Sumter et al., 2020) have looked at product designers and architects with a pre-existing knowledge of CE, this study attempts to measure the knowledge level of a sample of currently practicing retail design professionals. Using an explorative method, we conclude that many of these professionals have only a superficial knowledge of CE and its principles. This indicates that there is a strong need not only to educate new designers in CE principles, but also to offer supplemental education and training for experienced design practitioners.

Collaboration is the very heart of a CE transformation, and the findings in this study underscore the need for a systemic approach. Further research on the role of design in CE should focus on *how* to train designers—and for that matter, the entire network of collaborators—for the implementation CE principles. Further research should also focus on *when* designers should take a leadership role in facilitating and coordinating CE principles. Apart from this, we hope that our approach to analyzing CE systems according to the particular needs of a specific design ecosystem can serve as inspiration for similar research in other design fields. Moving toward sustainable design practices is a topic that

needs to be addressed as much from within its own quarters as it does in politics and industry. We hope that this study represents a first step toward equipping designers for the future we all face, and to putting them in a position to lead the design process strategically.

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