

THE CLLOG SYSTEM

A SERVICE SYSTEM TOWARDS FASHION SUSTAINABILITY

Vilma Januário Bernardino

Dissertação para obtenção do Grau de Mestre em

Branding e Design de Moda

(2º ciclo de estudos)

Orientadora: Prof. Doutora Rita Salvado

Co-Orientadora: Prof. Doutora Seçil Ugur Yavuz

Covilhã, Junho 2017.

À minha mãe, que sempre disse
que eu podia ser tudo o que quisesse.

ACKNOWLEDGEMENTS

Não cheguei até aqui sozinha. Este é, antes de mais, o resultado de um longo trabalho desenvolvido com minhas orientadoras, a quem profundamente agradeço. À Professora Rita Salvado, agradeço por me ter aceite e a este projeto sem pensar duas vezes, por ter estado sempre disponível, muito além da sua função de orientadora, e por ter trazido a Professora Seçil para ele. À Professora Seçil Ügur agradeço ter estado sempre perto, apesar da distância geográfica, por todas as dicas e entusiasmo. Este trabalho não seria o mesmo sem a vossa contribuição, hoje sinto-me uma pessoa mais rica e mais próxima da realização dos meus sonhos por vossa causa. Não existem palavras que agradeçam o suficiente.

Agradeço a todas as pessoas que de alguma forma contribuíram para o desenvolvimento do trabalho. Aqueles que responderam aos inquéritos e em especial às participantes do workshop: Sandra G., Lúcia, Sandra R., Rosa, Bia, Bela, Fatinha, Ângela, Mena, Joana, Telma, Edna, Paula, Ana e Alícia; e às entrevistas: Cristiana da Náz e Isolda da Rosários⁴. Tornaram este trabalho mais rico e valioso. Um obrigada, do tamanho do mundo, ainda à Kelly*, pelas ilustrações do storyboard, por estar sempre pronta para me ajudar, mas especialmente por ser quem é.

Agradeço a todos os colegas com quem partilhei este Mestrado, pela amizade, pela experiência e pelos conhecimentos, em especial à Cris, que contribuiu ativamente para que as ideias fossem tomando forma. Obrigada por, mesmo longe, me incentivares diariamente a não desistir!

À minha família e aos meus amigos que sempre acreditaram em mim. Foram dois anos especialmente difíceis, de muitos sacrifícios e ajustes, mas valeu a pena. Este dia não seria o mesmo se não pudesse ser dividido convosco. À minha mãe, ao Carlitos e à minha avó por me terem proporcionado sempre a possibilidade de ser quem queria ser, de realizar todas os sonhos e experiências a que me propus e por ser quem sou. Às minhas irmãs, Alícia e Edna, por me fazerem sentir que tenho uma claque e hoje serem também a minha inspiração. Ao meu marido: Mário, obrigado por teres tornado este sonho possível, em todos os aspetos e por estares ao meu lado nas decisões mais difíceis. Não é fácil estar em constante competição com livros e post-it, mas foi apenas um treino para o doutoramento!

Finalmente, a todos os professores que me inspiraram desde o primeiro dia, da primeira classe. Sou grata pelos professores fascinantes com quem me cruzei ao longo destes 19 anos. Direta ou indiretamente este é, também, o fruto do vosso trabalho, também a muitos de vós devo parte daquilo que sou.

RESUMO

No que diz respeito ao mundo da moda, o início do século XXI fica marcado pela proliferação do *Fast Fashion* e *overconsumption*. A forma como se consome, hoje, desafia os limites do planeta e daqueles que vivem nele, e por isso são urgentes soluções disruptivas e radicais rumo a um mundo mais sustentável. Uma estratégia de design muito promissora capaz desta mudança radical ao sistema de moda atual é aquela que junta produtos e serviços - *Product-Service System* (PSS) - e que é capaz de criar significado e afinidade consumidor - produtos.

Ainda que vista por muitos como superficial e passageira, a moda é uma das melhores ferramentas para moldar estilos de vida e valores culturais. Apesar de se expressar através de produtos, é, na verdade, muito mais sobre sentimentos, a moda tem o poder de criar uma sensação de individualidade e pertença, como duas narrativas distintas num único personagem. Portanto, a principal questão a responder neste trabalho é: como deve ser desenhado um novo sistema de moda sustentável em que consumidores se comprometam com produtos durante mais tempo, mas sem que percam a sensação de individualidade e pertença?

Este trabalho faz uma revisão bibliográfica a Sistemas de Produto-Serviço de Moda e seu impacto no rumo à sustentabilidade de forma a estabelecer o estado da arte. Foca-se em temas relacionados com o comportamento do consumidor e em como desenvolver apego entregue pessoas e produtos; design de moda sustentável, dando destaque a estratégias de design participativo e circular; e *storytelling*, como elo de ligação e criador de calor num Sistema de Produto-Serviço (PSS).

Um Sistema de Produto-Serviço (PSS) baseado no estudo precedente é apresentado como ferramenta para a implementação deste modelo em marcas e produtos. Uma análise ao seu funcionamento sob o ponto de vista do utilizador e dos fornecedores é apresentada, assim como conclusões e possíveis melhoramentos ao mesmo.

A principal contribuição deste trabalho encontra-se na possibilidade de observar a integração de um modelo PSS a uma marca real e trazer um elemento prático para uma área que ainda é dominada por trabalho teórico, contudo esta é uma abordagem inicial que merece ser continuada e desenvolvida em futuras investigações, neste sentido algumas sugestões são levantadas.

Palavras-chave: Sistemas de Produto-Serviço (PSS), Moda Sustentável, Design Participativo, Storytelling, CPA (Apego Consumidor-Produto), Têxteis Inteligentes

RESUMO ALARGADO

A sociedade de consumo em que nos temos progressivamente tornado desde a segunda metade do século passado está-se a tornar numa sociedade de consumo excessivo. No que diz respeito ao mundo da moda, tal facto é corroborado pela proliferação exponencial do *Fast Fashion* - um modelo de negócio que torna roupas inspiradas nas melhores marcas de moda e últimas tendências das passarelas acessíveis às massas. Este modelo, foca-se especialmente numa fase da vida do produto - a da venda, tornando o seu atributo mais importante, o ser barato, em vez da sua qualidade (Aus 2011), o que favorece a compra e descarte por impulso.

A realidade é que a forma como se consome, hoje, desafia os limites do planeta e daqueles que vivem nele, e por isso são urgentes soluções disruptivas e radicais rumo a um mundo mais sustentável. A estratégia de design mais promissora capaz desta mudança radical ao sistema de moda atual é aquela que junta produtos e serviços - *Product-Service System* (PSS) - e que é capaz de criar significado e afinidade consumidor - produtos.

Ainda que vista por muitos como superficial e passageira, a moda é uma das melhores ferramentas para moldar estilos de vida e valores culturais. Apesar de se expressar através de produtos, é, na verdade, muito mais sobre sentimentos, a moda tem o poder de criar uma sensação de individualidade e pertença (Fletcher 2008), como duas narrativas distintas num único personagem.

Portanto, a principal questão deste trabalho é: como deve ser desenhado um novo sistema de moda sustentável em que consumidores se comprometam com produtos durante mais tempo, mas sem que percam a sensação de individualidade e pertença?

A resposta a esta questão conduz ao principal objetivo do trabalho: entender como fomentar uma relação forte entre pessoas e produtos de moda, de forma a adiar o seu descarte e assim criar um novo sistema de moda sustentável.

Para isso, este trabalho foi dividido em três capítulos de pesquisa não intervencionista: revisão bibliográfica a Apego Consumidores - Produtos (CPA); Design de Moda Sustentável com foco em estratégias de design participativo e circular; Sistemas de Produtos-Serviços (PSS); e *Storytelling*. Seguidos de dois capítulos de pesquisa intervencionista: análise do envolvimento do utilizador e participantes num sistema de moda sustentável e proposta deste novo modelo.

CAPÍTULO 2 - PADRÕES E HÁBITOS DE CONSUMO

O século XXI chegou com um novo paradigma de consumo, profundamente relacionado com a facilidade de acesso tanto a produtos como informação. A internet mudou a forma como nos

relacionamos, e teve um papel chave na globalização. A geração atual tem e sabe mais que qualquer outra, contudo isso não tem sido levado a que as melhores escolhas sejam feitas.

O planeta está a ser destruído diariamente pelas nossas escolhas insustentáveis, é por isso determinante que se perceba o que os consumidores tanto procuram, os seus desejos mais profundos, mas principalmente como reeduca-los.

Este capítulo, procura, portanto, determinar os padrões de consumo e comportamento entre os consumidores e produtos de moda, com o principal objetivo de perceber as escolhas do consumidor, mas especialmente como podemos alterar essas escolhas. Inicialmente será apresentado o conceito de hábito, comportamento e padrão, de forma a compreender os atos inconscientes que processamos diariamente.

Depois disso, perceber as diferenças entre o consumo de *Fast Fashion* e Moda Sustentável, os diferentes impulsionadores que conduzem à compra em cada um destes casos opostos, determinando as melhores escolhas e opções na mudança para a sustentabilidade.

Finalmente será abordado o principal tema do capítulo - CPA - apego consumidor-produto. CPA apresenta-se como a chave para alterar a relação entre o consumidor e produtos: produtos estimados, pelos quais se tem carinho, têm hipótese de “viver” por muito mais tempo, serem arranjados quando algum problema surge, e passados entre gerações como símbolos e portadores de memórias. Ao potenciar este tipo de relacionamento, potencia-se também novos comportamentos de consumo. Para este trabalho, em particular, é um tema determinante, uma vez que o apego é uma das ferramentas para o novo sistema de moda sustentável apresentado no capítulo 6.

CAPÍTULO 3 - RUMO AO DESIGN DE MODA SUSTENTÁVEL

A indústria têxtil e de moda é um dos sectores industriais mais antigos, e também um dos principais responsáveis pela poluição ambiental mundial. Desde o final dos anos 80 do século passado que esta indústria tem encarado um crescimento sem precedentes, muito devido à necessidade / vontade de acompanhar as constantes mudanças do mercado.

O desperdício produzido anualmente, por todo o mundo, resultante da obsolescência e descarte rápido de roupas, é uma das principais preocupações do século XXI. De tal modo que se está a chegar a um ponto em que a mudança a nível de materiais e técnicas de produção não é suficiente no rumo a um mundo mais sustentável, é determinante uma mudança sistémica mais radical, que envolva a indústria no seu todo, incitando a consumir muito menos.

Com a sustentabilidade no centro do modelo de negócios de uma marca de moda, designers desempenharão um papel chave, uma vez que têm a possibilidade de desenhar o ciclo de vida

completo dos produtos. Assim, está nas suas mãos desenvolver produtos não apenas esteticamente apelativos, ou na moda, mas com toque, cor e materiais agradáveis, e bom corte; produtos que durem e possam até ser multifuncionais; produtos que possam ser reparados, melhorados e recriados. Ainda antes de um produto existir, o designer poderá determinar o seu fim de vida, desenvolvendo toda a sua vida com isso em atenção.

Este capítulo dedica-se a uma revisão bibliográfica à moda sustentável, com particular ênfase a estratégias de extensão de vida dos produtos. A abordagem à moda sustentável neste trabalho será, então, relacionada essencialmente com o poder dos Sistemas de Produtos-Serviços (PSS) na mudança comportamental do consumidor, e não do ponto de vista material.

Os primeiros cinco subcapítulos exploram os conceitos de desenvolvimento sustentável, design para a sustentabilidade, design de moda sustentável e Sistemas de Produtos-Serviços (PSS), assim como o papel do designer. O sexto subcapítulo apresenta estratégias para o prolongamento do tempo de vida dos produtos e para a circularidade, temas como co-criação, customização, *halfway products*, *upgrading*, reparação, aluguer, reutilização, reciclagem e *upcycling*, serão explorados enquanto conceito, suportados sempre por exemplos práticos. Finalmente será abordado brevemente o tema dos têxteis inteligentes, apresentando duas opções de tecnologia e seus exemplos. Este trabalho apoiar-se-á nesta tecnologia para desenvolver o apego consumidor-produto através da preservação de memórias e histórias.

CAPÍTULO 4 - STORYTELLING - UMA NOVA FERRAMENTA PARA CPA

A arte de contar histórias é tão antiga quanto a própria humanidade. É a forma mais antiga de comunicação e a mais efetiva na passagem de conhecimento e valores. Recentemente investigadores perceberam que *storytelling* é a linguagem nativa do cérebro, sendo que através de histórias é mais fácil aprender, lembrar e pensar.

O ser humano teve desde sempre a capacidade de se colocar no lugar dos personagens, vivendo as suas histórias, contudo ao longo do tempo têm vindo também a necessitar, cada vez mais, de passar deste papel passivo para um mais ativo. É por isso que, ao longo do tempo, certas histórias foram permitindo a participação da sua audiência, vejamos por exemplo o caso do programa televisivo da década de 90 “Você decide”. Neste, ao início de cada episódio dois possíveis finais eram dados a conhecer, e o público através de tele-votação fazia a sua escolha; o final mais cotado seria o emitido. Este tipo de interatividade previa, de acerta forma, as mudanças que as media sociais iriam trazer no início do século XXI.

Agora, mais do que nunca, as pessoas fazem parte das histórias umas das outras, identificam-se com elas e seguem-nas nas redes sociais. Esse é um dos motivos pelo qual o *storytelling* tem sido apontado como uma ferramenta de valor a considerar para pesquisa de design,

marketing e gestão de marcas, usada especialmente para entender aspetos subjetivos dos relacionamentos entre utilizadores e produtos.

Para este trabalho, o *storytelling* tem um papel fundamental na conexão de produtos, marcas e pessoas. No mundo digital atual, a forma como contamos e partilhamos histórias está em constante evolução, o emissor e o recetor vivem interativa e alternadamente e a história em si jamais terá uma narrativa linear.

Portanto, para perceber todas estas mudanças e o real benefício do *storytelling*, este capítulo fará uma introdução ao conceito de *storytelling* digital, introduzindo os seus atores e papel. De seguida apresenta-se a importância das media sociais nesta evolução, e como têm facilitado a participação e aproximação da audiência à história. Finalmente, será apresentada a vantagem competitiva do *storytelling* para criação de apego marca-consumidor.

CAPÍTULO 5 - O SISTEMA CLLOG - UM SISTEMA PRODUTO-SERVIÇO PARA A MODA SUSTENTÁVEL

Os sistemas produto-serviço (PSS) são uma estratégia teórica bem fundamentada, mas que em termos práticos não se encontra vastamente implementada. Ainda que estratégias de serviços ligados a produtos estejam a ser utilizadas para melhoria do CPA, na realidade vêem-se poucos produtos e serviços a coexistir num mesmo sistema que realmente busca a sustentabilidade.

O Sistema CLLOG pretende mostrar como um serviço de histórias combinado com produtos pode alcançar a sustentabilidade através da longevidade dos produtos. Baseado em toda a bibliografia anterior este sistema liga consumidores e produtos, incitando os consumidores a serem mais ativos na fase de uso do produto (registando as suas histórias e criando memórias com este; assim como fazendo algumas emendas ou alterações para que o produto se mantenha atrativo durante mais tempo), assim como no seu descarte (promovendo a venda em segunda mão ou por exemplo o seu *upcycling*).

Este capítulo apresentará então este novo sistema de moda sustentável, como ele funciona e quem são os seus intervenientes. Será ainda possível observar a jornada de um produto neste sistema e no seu ciclo de vida, assim como a jornada de um consumidor.

Este novo conceito apresenta-se bastante promissor, especialmente depois do *feedback* recebido pelos diferentes intervenientes. Seria bastante interessante no futuro desenvolver a APP de forma a fazer uma avaliação mais realista do mesmo, assim como perceber a melhor forma de envolver o consumidor sem que este se sinta incitado a consumir mais devido a este modelo.

CAPÍTULO 6 - O SISTEMA CLLOG - PESQUISA INTERVENTIVA - Envolvimento dos Intervenientes

São vários os estudos feitos na Europa do consumo de produtos de moda, de forma a perceber as motivações de uso e descarte destes produtos.

Antes de mais é muito importante clarificar como o estudo de produtos de moda difere do estudo dos demais produtos. Isto porque produtos de moda são representados na realidade identidade própria, como Niinimäki (2011) afirma, num contexto social, o vestido, o corpo e a pessoa são vistos como um todo.

Tendo isto em conta, é mais fácil perceber que o descarte de um produto de moda não está necessariamente relacionado com o funcionamento do produto, ao mesmo tempo que a compra também não está necessariamente relacionada com o cumprimento da necessidade de proteção. Aliás, os estudos mencionados anteriormente, mostram que a principal motivação para a compra de produtos de moda está relacionada com, e por ordem de importância: o acompanhamento das tendências, preço atrativo, necessidade de roupa para uma ocasião especial, a marca, hábitos de compra e finalmente substituição por desgaste da roupa.

Em Portugal, especificamente não existe muita informação sobre este tema, daí que para perceber as motivações dos consumidores tenha sido elaborado um inquérito. As principais conclusões deste apontam para que o desempenho expressivo da roupa seja mais relevante que o desempenho instrumental, tanto nas motivações de compra, profundamente relacionadas com o acompanhamento de tendências e cansaço da roupa que têm; como nas motivações de descarte, em que as tendências e cansaço mantêm uma posição relevante. Contudo é de salientar, que no que diz respeito ao descarte o desempenho instrumental parece relevante uma vez que cerca de 40% dos inquiridos fá-lo devido a desgaste e deformação.

Outros dados importantes mostram que o consumidor mantém os produtos de moda por apenas dois / três anos, e que a principal opção tomada em fim de vida do produto é a doação. Estes dados, devido a alguma incoerência que poderá estar relacionada com a representatividade da amostra deste inquérito, fizeram a autora levantar uma série de questões que poderão ser estudadas em trabalho futuro, relacionadas especialmente com o fim de vida dos produtos. Isto porque apenas 1 pessoa em 45 afirma deitar ao lixo a sua roupa, o que não representa de todo o volume de lixo têxtil urbano; mais, 70% afirmam que doam a sua roupa, contudo 40% diz que substitui a roupa devido ao seu desgaste. A questão que se levanta é que razões levam uma pessoa a doar, se se está a fazer a triagem correta da roupa que doa, ou se a roupa está efetivamente sem qualidade para continuar a ser utilizada.

Destes inquiridos, 1/3 participou num *workshop* em que o sistema CLLOG foi apresentado. O principal objetivo do *workshop* era perceber a receptividade de um modelo como este, e ainda solicitar a participação para a escolha da localização da etiqueta. Os principais dados

recolhidos mostram que na sua generalidade os participantes estão abertos a este modelo e em ter algum tipo de participação ativa no seu relacionamento com as suas peças de roupa. Percebeu-se ainda que participante mais jovens apostam em etiquetas mais discretas, enquanto que participantes de idades mais avançadas gostariam que esta se destacasse das suas roupas.

De forma a perceber a receptividade dos restantes *stakeholders* foram efetuadas duas entrevistas, à Náz, uma marca de moda sustentável, e à Rosários4, uma marca de fios para tricot. As marcas apontaram como ponto relevante deste novo sistema a transparência e proximidade ao consumidor, mostrando-se interessadas em participar de um projeto como este.

CONCLUSÃO

Ao analisar os dados estatísticos sobre desperdícios têxteis e ao analisar a indústria têxtil e da moda no seu todo percebe-se que, de modo a responder aos atuais requisitos ambientais, ainda há muito a fazer. É certo que a sustentabilidade está na ordem do dia, que muitas mudanças estão a acontecer em marcas de moda dos mais variados segmentos, contudo ainda está por se perceber o impacto real desta abordagem a nível social, económico e ambiental.

Na realidade, apenas uma mudança radical dos hábitos e padrões de consumo que conduza à desmaterialização e redução de desperdício contribuirá para mudanças significativas ao paradigma atual. Para tal, é importante, antes de mais, conectar o consumidor aos seus produtos de moda, de forma a estender o ciclo de vida dos produtos e contrariar o exponencial crescimento de desperdício têxtil. O modelo *Product-Service System* apresenta-se como uma proposta muito promissora nesse sentido.

O principal contributo deste trabalho é, portanto, a apresentação de um modelo que coloca em prática todo o trabalho bibliográfico feito no tema *Product-Service System*, que até aqui se tem mostrado predominantemente teórico. O trabalho reflete ainda o poder do *storytelling* como agente aglutinador de produtos e pessoas, e força motriz deste sistema. A viabilidade da proposta encontra-se devidamente corroborada pela participação dos diferentes *stakeholders* deste sistema, tanto os parceiros (designers, marcas, artesãos, etc.), como utilizadores.

Em trabalho futuro seria de interesse desenvolver um protótipo da aplicação que suporta o modelo do sistema apresentado e implementa-lo numa comunidade beta. Os resultados obtidos através de tal experimento serão de grande relevância para determinar as formas corretas da construção narrativa, assim como os melhores meios e canais de comunicação.

ABSTRACT

Concerning the fashion system, the beginning of the 21st century is marked by the proliferation of Fast Fashion and over-consumption. The way people consume today is pushing at the boundaries of the planet and those who are living in it. Therefore disruptive and radical solutions are urgently needed towards a more sustainable world. One of the most promising design strategy capable of creating this radical change in the current fashion system is Product Service System (PSS) design strategy that does not only concentrate on the product itself, but also proposes service solutions in order to add extra volume and meaning to the product by turning the over-consumption phenomenon into a more sustainable system.

Although seen by many as superficial and fleeting, fashion is one of the best tools for shaping lifestyles and cultural values. As fashion has the power to create a sense of individuality and belonging at the same time, the work presented in this paper questions: How should a new sustainable fashion system be designed in order to engage the consumer with long-term products without losing the sense of fashion individuality and belonging?

In order to answer this question the paper represents a literature review on the Fashion Product-Service System (PSS) field and its impact for sustainability in order to determine the state of the art for a second phase that will exemplify and corroborate the research carried out as a proposal of a service-system design for a sustainable Fashion System. It focuses on themes such as consumption patterns, sustainable fashion and storytelling, defining their role within a Product-Service System (PSS) towards a sustainable fashion system.

The review points the relevance of PSS to drive sustainability and supports PSS as a tool for the implementation of the model in fashion brands and products. This is an initial approach that deserves to be developed and tested in future investigations.

Keywords: Product-Service System (PSS), Sustainable Fashion, Storytelling, CPA - Consumer-Product Attachment, Participatory Design, Smart Textiles

INDEX

DEDICATION	II
ACKNOWLEDGEMENTS	III
RESUMO	IV
RESUMO ALARGADO	V
ABSTRACT	XI
INDEX	XII
CHAPTER 1	
INTRODUCTION	1
1.1 CONTEXT	1
1.2 RESEARCH QUESTION	3
1.3 OBJECTIVES	3
1.4 METHODOLOGY	4
1.5 ROADMAP	4
CHAPTER 2	
CONSUMPTION PATTERNS AND CONSUMER BEHAVIOR	6
2.1 CONSUMER BEHAVIOR	7
2.2 FASHION CONSUMPTION PATTERNS: FROM FAST- FASHION TO SUSTAINABLE FASHION...	8
2.3 TOWARDS SUSTAINABLE FASHION CONSUMPTION THROUGH ATTACHMENT.....	9
CHAPTER 3	
TOWARDS FASHION DESIGN SUSTAINABILITY.....	12
3.1 SUSTAINABLE DEVELOPMENT	13
3.2 DESIGN FOR SUSTAINABILITY	14
3.3 THE DESIGNER ROLE	15
3.4 TOWARDS SUSTAINABLE FASHION DESIGN	16
3.5 PSS (PRODUCT-SERVICE SYSTEM) AN APPROACH TO SUSTAINABLE FASHION DESIGN	19
3.6 PARTICIPATORY DESIGN AN APPROACH TO DESIGN FOR CIRCULARITY	23
3.6.1 PRODUCT DESIGN AND PRODUCTION	25

3.6.2	PRODUCT USE	30
3.6.3	PRODUCT DISCARDING	34
3.6.4	CONCLUSION	39
3.7	SMART TEXTILES	39
CHAPTER 4		
	STORYTELLING, A NEW TOOL FOR CONSUMER-PRODUCT ATTACHMENT (CPA)	42
4.1	DIGITAL STORYTELLING	43
4.2	THE SOCIAL MEDIA ROLE	44
4.3	STORYTELLING IN BRAND MANAGEMENT	45
CHAPTER 5		
	THE CLLOG SYSTEM - A SERVICE SYSTEM FOR FASHION SUSTAINABILITY	47
5.1	CLLOG'S INTRODUCTION	48
5.1.1	THE TREE MAIN PILARS	48
5.1.2	HOW IT WILL WORK	49
5.2	PRODUCT AND USER JOURNEY MAPPING	51
5.3	STORYBOARD	54
5.4	CONCLUSION	57
CHAPTER 6		
	THE CLLOG'S SYSTEM - INTERVENTION RESEARCH -STAKEHOLDERS' INVOLVEMENT	59
6.1	USER'S INVOLVEMENT - SURVEYS AND WORKSHOP	60
6.1.2	FIRST SURVEY	60
6.1.2	WORKSHOP	65
6.1.3	SECOND SURVEY	72
6.2	BRANDS, DESIGNERS AND PARTNERS INVOLVEMENT - INTERVIEW	77
6.3	CONCLUSION	81
	CONCLUSION AND FUTURE INVESTIGATION	83
	BIBLIOGRAPHY	86

CHAPTER 1 - INTRODUCTION

1.1 CONTEXT

The well-known consumer society in which we've been living is turning now into an overconsumption one. According to the "Time out for Fashion" research, published in November 2016 by Greenpeace, clothing production doubled between 2000 and 2014 and the average person buys 60% more items of clothing every year and keeps them for about half as long as 15 years ago, as one of the greatest consequences of Fast Fashion.

This fashion business model of "low-cost clothing collections based on current, high-cost luxury fashion trends" (Joy et al. 2012) is an exclusive experience from the 21st century (Kozłowski 2012) and is focused in only one phase of the product life cycle, the sales transaction, from the point of view of the manufacturer as well as from the consumer. Hence, the value of a product is no longer its quality, but rather its cheapness (Aus 2011).

Fast Fashion has changed the way we dress and relate to fashion - we buy more clothes, wear them less, and treat them as disposable items. 95% of the clothes that are thrown away could be re-worn, reused, repaired, or recycled but are part of the millions of tones of textiles that end up in landfills every year around the world (Greenpeace 2016). The way we are consuming today is pushing at the boundaries of the planet and of those who are living in it. To create and sell clothes that are always getting cheaper companies have relocated to countries with low labor costs and inadequate environmental regulations (Fletcher, 2008), which run against the social and environmental concerns of sustainable development.

Sustainable development is an expression that does not meet much consensus, however the most widely accepted definition is the one proposed by the World Commission on Environment and Development, which defines it as the development model that allows us to meet our own needs without compromising the ones from the future generations (Gardetti and Torres 2013), with social, economic and environmental sustainability as the main goal.

The current fashion system impacts (environmental, social and economical) and specially the new consumption behaviors seem to be an antithesis to sustainability. It's impossible to ignore the contrast between the long-term perspective from sustainability and the change promoted by fashion for purely semiotic or symbolic reasons (Koefoed and Skov undated) yet, according to Walker (2006), that doesn't mean that these two will necessarily come into

conflict, in the opposite, fashion may even be a key element towards a more sustainable way of living.

The focus towards sustainable fashion could not lie only in the change to organic materials if the all system remains the same, where garments are transported around the world to be worn a few times, or none, and discarded into landfill at the end of the season. While organic fibers are part of the solution, the need for a new model of making and consuming clothes is the greatest one (K Kuusk et al. 2014). And as Armstrong et al. (2015) pointed, the most promising design strategy is the one that merges products with service elements, Product-Service System (PSS). To make a new sustainable model in the fashion field the quality of products is determinant, only a shift to a more highly skilled, craft-based production will permit the extension of clothing lifetime through repair and reuse (Cooper 2005). Moreover, in a model claiming for a reduced demand of products it would provide new employment opportunities (Cooper 2005) and therefore brings credibility to the business model.

However, it is important not to forget that a new model for the fashion system will only have a great impact if it leads to a major behavioral change, and that it's only possible if the system has the power to create meaning and connection. As Niinimäki (2011) clarifies "if the designer can connect the design outcome deeply with a consumer's emotions, identity construction, aesthetic needs and personal memories, that is, values and lifestyle, the design process can achieve a deep product satisfaction and product attachment."

And fashion is one of the best tools to shape lifestyles and cultural values, because through fashion our clothes have the power to communicate our own individuality while integrating us into a tribe, linking us to time and space (Fletcher 2008), it's a deep cultural expression so frequently confused with a transient and superficial thing deeply related to a passing trend (Gardetti and Torres 2013) because it's difficult to see through all these changes that the meaning remains unaltered.

In the Internet era, digital solutions present itself as a promising approach to promote changes, so in the fashion design field, smart textiles that connect material to digital media seem to be one of the best vehicles to reach such goal. Smart textiles that is defined as "textile products such as fibers and filaments, yarns together with woven, knitted or non-woven structures, which can interact with the environment / user" (Stoppa and Chiolerio 2014), can facilitate the attachment between people and products, while adding value; allowing the preservation of memories and stories through what we wear.

1.2 RESEARCH QUESTION

Although fashion is always associated as a material product that is worn by people, it is much more about feelings than about the product itself. Fashion has the power to create a sense of individuality and belonging at the same time, as two different narratives in the same character. So, the main question of this work is:

How should a new sustainable fashion system be designed in order to engage the consumer with long-term products without losing the sense of fashion individuality and belonging?

In order to properly answer this question, another set of questions must be taken into account, such as:

How should a service system be designed to engage user to products without encouraging overconsumption?

What is the user's role in this kind of system? Are they the main character?

Should the service empower users to be more involved in the life of their products?

What is the value of a story in creating a sense of connection, belonging and engagement?

Which is the best way to connect people stories with products stories in order to create a new narrative?

Can social media help people to share their stories through their products and what are the best channels to do it?

1.3 OBJECTIVES

The answer to these questions will lead to the main objective of the work that is to understand how we can form a stronger relationship between people and fashion products, in order to postpone disposal and therefore create a new sustainable fashion system.

To support it, it is important to find an innovative way to address sustainability in the fashion industry; enumerate the different design strategies that will support it and relate them with each other; evaluate emerging business models in the sustainable fashion field; identify the advantages of product-service systems to sustainability; determine the consumer's and designer's role; and finally, but as much important, find a new way to promote engagement and meaning through storytelling; use storytelling as the bridge between products and services and the base of a new Fashion System.

1.4 METHODOLOGY

To fulfill the main objective of the work and answer to the primary research questions, initially a bibliographic review will be presented to define the state of the art about CPA - Consumer-Product Attachment, Sustainable Fashion Design, Service System Design and Storytelling with the main objective of creating a connection between them. To better understand how new models for fashion are arising, some case studies on DIY, Up-cycling, Design for Circularity, Smart Textiles and Storytelling through textiles will be explored as a *non-intervention research*.

In a second phase the work will focus on a methodology used in PSS design - the user journey mapping - to understand how, when and where people will contact with the service, and to better know all the stakeholders involved and their connections. As a final outcome, a Fashion Service System will be designed to exemplify and corroborate the research carried out, some interaction tests will be simulated to evaluate the impact/usability of the system and to collect opinions from stakeholders, as an *intervention research*.

1.5 ROADMAP

This work is divided in six chapters. The first one, the introduction, aims to contextualize the theme, justify its pertinence and the raise of the research questions, as well as defining how this work was developed.

The next three chapters present a bibliographic review in the three main themes that are the foundation of this work: Consumer Behavior and opportunities for attachment; Fashion Design for Sustainability and Storytelling.

The last two chapters are dedicated to the system proposal that will connect all the bibliographic review and show how can it be implemented in practical terms, and the intervention research, with the stakeholders' involvement through inquiries, workshop and interviews.

CHAPTER 2 - CONSUMPTION PATTERNS AND CONSUMER HABITS

The 21st century arrived with a new consumption paradigm deeply related to the ease of access to both to products and information. The Internet changed the way we relate with the world, playing a leading role in globalization. We have more and know more than any generation before, however that isn't properly leading us to the best choices.

We live in a planet that is being destroyed everyday by our unsustainable choices, by our unfulfilled needs. It's determinant, at this point, to understand what are we are, as consumers, seeking for, what inner desires are calling for accomplishment; and especially how can we be reeducated to consume in a radical new way, that will allow others to live in this planet after us.

This chapter I will explore consumer behavior and consumption patterns in fashion. The main goal is to understand why we choose what we choose, and especially, what can we can do to change that.

So, in the first subchapter will define the concept of habit, behavior and pattern in the consumption field, to understand the unconscious acts we perform every day.

In the second subchapter the focus will be on the difference from fast-fashion and sustainable consumption, to understand consumers drivers, and the best options in the switch to sustainability.

Finally, the third subchapter will present attachment as the key to change the consumer-product relationship, hence consumer behavior. For this work this is a determinant subject, once this will be one of the tools for the new sustainable fashion system presented in chapter 6.

2.1 CONSUMER BEHAVIOR

A habit is an intrinsic thoughtless act that come so naturally due to repetition and consistency (Nazzaro 2015), as Gulden and Moestue (2011) pointed in his work referring to Grankvist & Biel, the strength of a habit is deeply connected to the frequency of a past behavior; physical, perceptual, social and cognitive contexts of habitual stimuli have influence on behavior, so on the one hand new, difficult or instable contexts will influence behavior, rather than the habit itself, but on the other stable contexts habits are likely to develop and to exert an influence on behavior.

Consumer behavior is a young field in terms of behavior research, and even if it is commonly related to the buying act, it is much more than that, once it also explores how having things affect lives and the sense of being (Solomon et al. 1999). To understand consumer behavior is to understand the thought, the feelings and the actions taken by consumers before and during the buying act (Rahmiati 2016). Kotler & Armstrong (2012) have defined 5 stages in consumer decision making process: need recognition, information search, evaluation of alternatives, purchase decision and post-purchase behavior; Hapsari (2014) adds that not all consumers pass through all these phases in their everyday purchases, but it's undeniable the complex situations consumers should face through all of them.

In the capitalistic world we live in, consumption became a means of shaping personal and social identity, it's a lifestyle, a cultural meaning, "Indeed, consumption can be regarded as playing such an important role in our social, psychological, economic, political and cultural lives, that today it has become the "vanguard of history"" (Solomon et al. 1999), and as Bauman (2001) pointed, as became symbolic.

Consumption is closely linked with the fulfillment of either tangible and intangible needs, so a deeper understanding of people needs and the meaning of consumption to them offer opportunities to change consumption patterns. In the current literature it is observed that most authors referred to the understanding of consumer psychosocial factors - cognitive, affective and behavioral - as a facilitator of engagement and consumer attachment (Nerurkar 2016).

2.2 FASHION CONSUMPTION PATTERNS: FROM FAST- FASHION TO SUSTAINABLE FASHION

Fashion consumption today is in its majority related to Fast Fashion, which is low-cost clothes that mimic luxury fashion brands within a fast-response system (Fletcher 2008). The consumption patterns set by such model puts consumers and producers in a vicious circle that moves faster than ever before, where producers seek to give more and more products every day and most consumers are “adhering to the modernist paradigm of “the cheaper the better”” (Koefoed and Skov undated).

This concept will continue to affect the fashion industry for the next decade and will have great impact in the way consumers buy and react to trends (Rahmiati 2016), once they value, now, quantity over quality and the resources needed to fulfill their needs and desires. However, it is important to notice that “consumers can learn how to make more sustainable choices in the purchase, use, care of, and disposal of apparel items by informing, creating awareness, and value” (Kozlowski, Searcy and Bardecki 2016) and that there are already a significant number of consumers that feel disenchanting with this mindless consumption model and its impact in society (Joy et al. 2012). However, now, there are few consumers who are active and talk about ethical consumption, but they may take the lead to influence others (Niinimäki 2006).

The current fashion system and consumption patterns turnover demands for an intrinsic behavior change, but to accomplish that, we need to acknowledge that people tends to consider a new alternative solution only when they know the outcome they take from it. So it's determinant to find the right influencer to change perceptions and attitudes that lead to adoption (Joy et al. 2012)(Armstrong et al. 2015). “To change consumption patterns you have to change people's habits” (Gulden and Moestue 2011).

The new generation is committed to save the environment (Joy et al. 2012) and are particularly interested in eco-design and ethical consumption (Niinimäki 2006), but hardly relate sustainability to fashion. Even young people that have a lot of sustainable practices, such as recycling, doing laundry only when having a full load machine or hang-drying, and that considered themselves as environmentalist, seem to feel no guilt by choosing short-term clothes or having any environmental thinking and values when buying them (Joy et al. 2012)(Niinimäki 2009). So, the biggest challenge for sustainable fashion is to make the new generations not only think more ethically, but also act (Carrigan and Attala 2001), and thus stop impulse buying and short-term thinking. “Sustainable fashion should become their dream, and all stakeholders in the fashion industry should strive toward this goal” (Joy et al. 2012), because “they have the power to change the future” (Niinimäki 2006).

It cannot be overlooked that consumers fulfill “deep inner motivations and unconscious needs by consuming” (Niinimäki 2009), so, to make consumers change, the products must change too, and answer to a mix of psychological factors: cognitive, affective and behavioral. Only when understanding the needs, wants, meanings of consumption, identity, values, lifestyle and person product attachment (Nerurkar 2016), designers will be able to offer products capable of promoting consumption patterns changes. When talking about fashion products, all these factors gain extra power, once fashion is much more related to emotional needs than physical; it expresses individual personality by external symbols (Niinimäki 2009) that will link you to some tribes and determine your social status.

Finally, for consumers, today, price is one of the most important factor of choice and purchase decision (Niinimäki 2009), along with aesthetics (Armstrong et al. 2015), the principal reason for Fast Fashion exponential proliferation. Those are the two principal factors to work on through sustainable fashion dissemination, in one hand explaining the reason why ethical, environmental friendly products are pricey, and giving them value through quality and longevity, and on the other hand work hard to supply aesthetically pleasant products.

2.3 TOWARDS SUSTAINABLE FASHION CONSUMPTION THROUGH ATTACHMENT

These days products are disposed prematurely because of low quality, but also, and specially, because new trends incite to exchange old products for new ones. Such happening highlights a failed person-product relationship (Chapman 2009) and, therefore, a failure for sustainable consumption, that on contrary is about long-term products (Cooper 2005).

In the context of sustainable design, the creation of meaning is one of the most important factors a designer should consider. By understanding consumer’s product attachment designers get the opportunity to develop solutions that promote engagement and emotionally durable design (Niinimäki 2010), solving the incapacity of long-term relationships that the clear majority of products have (Chapman 2009).

Creating deeper relationships will allow understanding better the consumers, their needs, desires and feelings about the shift of consumption habits. An approach based on satisfaction will facilitate the creation of value for the consumer, the company and the environment. Satisfied consumers use products longer, which is an opportunity on slowing down consumption and therefore minimize the amount of waste (Niinimäki, 2015).

Major questions related to the fast obsolescence of products have been discussed in the last decade, and if on the one hand we can find a lot of strategies to create extended use of products, such as: “reliability, durability, ease of maintenance and repair, long-life guarantees, design for upgradability and variability, classic style, and a strong person-product relationship” (Niinimäki and Armstrong 2013), on the other hand it seems that the greatest challenge in extending product life-times, which is achieving continued satisfaction with the product over time (Van Nes 2003)(2006) is still waiting for a proper answer.

Authors such as Schifferstein & Zwartkruis-Pelgrim (2008), Chapman (2009) and Koskijoki (1997) argue that most products are discarded soon due to their inability of sustaining a longer relationship with their owner, once only a few are capable of an emotional connection with them. Products and objects remain the same over time, but the relationship with the owner changes with the change of his own identity (Niinimäki and Armstrong 2013), so products may just lose their meaning. As Walker (2006) pointed, when a product is meaningful and precious to his owner, it is well taken cared, what postpones its replacement. Niinimäki and Koskinen (2011) say the same about cherished garments, the ones that are taken cared and repaired and with which meaningful relationships are created.

To promote product attachment is to promote meaning, value and care, what will postpone or even prevent product disposal. In the increasing of the attachment between people and products the possibility of slowing down products life cycles increases as well, but that attachment implies the existence of an emotional bond, and most of all a sense of irreplaceability, indispensability and self-extension (Schifferstein and Zwartkruis-Pelgrim 2008). It is important to notice that “new kinds of relationships with the costumer create new kinds of value in the business” (Niinimäki 2015).

In the study run by Schifferstein & Zwartkruis-Pelgrim (2008), they found that attachment varied with duration of ownership. Generally people are more attached to very new items or in the opposite by the ones owned for a long time. In the first case the attachment is linked with enjoyment and in the second one with memories. Hence, the products should be both useful and enjoyable - products that evoke sensory and aesthetic pleasure, and with a surprise element - as well as interactive - products that engage, that stimulate the use and consequently the opportunity to create memorable events, and products that encourage the interaction between people in a social context.

Other authors like Van Nes (2003), Mugge, Schifferstein & Schoormans (2004) also see in some strategies of product design such as “Do-It-Yourself”, “Do It With Others”, or Product Personalization, for instance, a way to improve CPA - Consumer-Product attachment, once all the efforts stimulated by the product bring significant synergies for the people involved. The product motivates the “live creature” to create its own experience, and as long as the experience is considered valuable, the product is considered valuable itself and become memorable overtime. Memories and history can only be part of a product through its use,

something that a new replacement product is absent, so when creating a product is important to enable participation and experimentation in order to facilitate memories and therefore to cool down the replacement (Gulden 2013).

As Norman (2005) pointed a higher level of attachment includes feelings, emotions, self-image, personal satisfaction, memories and cognition that are only reached in long-term relationships. Armstrong and Niinimäki (2013) concludes that this kind of emotional attachment vary by individual and that in what concerns to fashion is most related with old garments that usually are no longer in use. The bonding with fashion products during the use phase is still a very little explored field, so it's difficult to determinate the attachment level to this kind of products during this phase, the only variable known is the level of satisfaction about the product. Niinimäki (2015) argues, in her study about special and meaningful clothing items and the elements of pleasurable uses and person-product attachment in different temporal phases, that during active use, the most important attribute of a garment for the consumers is the pleasure experience it offers - consumer hedonism.

CHAPTER 3 - TOWARDS FASHION DESIGN SUSTAINABILITY

The textile and fashion industry are one of the biggest and oldest industrial sectors in the world, and currently one of the main responsible for environmental pollution as well. This industry is facing a non-stop grow since the 80's, due to the need of keeping up with the demand of an ever evolving market looking for instant products. And that has been pushing the limit of natural resources, but also the lives of those who work in the sector.

The amount of waste created every year around the world, resulting from the fast obsolescence and disposal of clothes, is one of the major concerns of the 21st century. We are reaching a point where it is not enough to only change materials or techniques to move to a more sustainable world, it is required a radical systemic approach that will revolutionize the industry as a whole.

With sustainability in fashion as goal, designers will perform a key role, once they have the chance to design the whole lifecycle of the product. It is in their hands to develop products not only looking for trendy aesthetics, but also with pleasant fit, color and materials; products that will last and that can be multifunctional; products that may be repaired, upgraded, recreated. Even before a product exists, the designer can already know how it will end, and develop its whole life with it in mind.

In this chapter I will do a bibliographic review in sustainable fashion, focusing especially in strategies to extend product lifetime. My approach to sustainable fashion will be, then, more related to the power of Product-Service System to change consumer behavior, instead of the materials point of view.

In the first subchapter I'll present a definition to sustainable development and its three main pillars - profit, planet and people.

In the second subchapter I'll demonstrate the value of design towards sustainability, demystifying the "green" label that have been associated with sustainable and eco-design.

The third subchapter is dedicated to the designer role. Design won't change anything if isn't made by a committed designer. I'll present some guidelines to be used by designers in the sustainable fashion field, while demonstrating how the designer plays the leading role in the transformation required by sustainability. With great responsibility also comes the certainty that the change in the fashion business model and consequent change in consumption practices it's in the designer's hand.

In the fourth subchapter I'll be focusing in sustainable fashion itself. Again, I'll explore consumption point of view instead of materials and techniques, with the main goal of understanding the best strategies to engage consumer and contribute to behavior change.

In the fifth subchapter I'll present Product-Service System as the better answer to sustainability, by doing an approach to design as a whole and demonstrating its strengths and weaknesses. I'll also explore the Product-Service System solution in Sustainable Fashion Design as a promising approach to lead to innovative business models, and make the needed shift in the current system.

The sixth subchapter will focus on strategies for circularity. This subchapter will be split in three major themes: production, use and disposal; in which of them different strategies to extend product lifetime will be presented. Each strategy will be followed by some examples of real businesses models.

Finally, the seventh subchapter will explore smart textiles. In a world deeply connected with internet and social media, it's capital to understand how this technology may contribute to the preservation of memories and engagement. So, some technologies will be presented.

3.1 SUSTAINABLE DEVELOPMENT

The concept of sustainable development results, first and foremost, from the recognition that the planet is moving into a state of environmental misfortune, and that such degradation is beginning to affect both developed and developing countries, as well as large and small populations dimension. This led to environmentalism becoming a political issue in the early 1970s at the Stockholm Conference, but it was not until 1992 at the Earth Summit - UN Conference on Environment and Development that, in fact, rights and duties to nations were settled and new local and global development strategies defined (UN 1997).

It was admitted, at this point, that sustainable development ensures "that (humanity) meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987), and it was created Agenda 21, a guideline document which directs all sectors of society to cooperate in seeking solutions to socio-environmental problems. Agenda 21 and the concept of "sustainable development" are thus milestones in the conversion of industrial society into a society that reinterprets and promotes progress, quality and balance, while becoming a reference for all human activities. However, these concepts often become somewhat ambiguous since it's difficult to define the needs of future generations and who defines them. Also, which standards should be used as reference, those

of developed or developing countries? What is a real need and what makes a necessity superfluous? And finally how all of these is measured (Ruano, 2000).

In a fast-growing and limited capacity world, current patterns of consumption and development are unsustainable, compromised and with unprecedented levels of environmental destruction. The transition to sustainability is, then, the process of learning to consume much less and improve physical and social contexts of life (Manzini 2004). This will imply a systemic discontinuity, a new process of social learning and the ability to make good use of the environment, only reachable through a socially inclusive, environmentally sustainable and economically sustained development in its time. That is to say that predicts respect for the actors' point of view, promotion of personal freedom, subsidiary encouragement, conservation of resources, use of the precautionary principle and, yet, an aesthetic discourse.

3.2 DESIGN FOR SUSTAINABILITY

Design emerges as a bridge in the transition to sustainability and as a foundation for the systemic discontinuity required for sustainable development. Given its complexity, the transition to sustainability is far from a linear evolution; on the contrary, it is a complex process of "social learning" (Manzini 2004). Sustainability cannot be achieved simply by redefining what exists, it is necessary to instill new ideas of well-being and business, new systems of production and consumption. It is therefore imperative to take people away from images produced and socialized in a recent past that become inadequate to face this new challenge, where quality and standard of living are not estimated by the quantifiable assets of each.

It is important to demystify the concept of Sustainable Design and realize that this design approach goes far beyond to the "green" label that has been attached to it over time, even because there are no "environmental friendly" goods, the most that can exist are goods (products, infrastructure and services) with less environmental impact (Tischner 2000). This new concept of design then seeks to better recognize and achieve consumer needs - socially, economically and environmentally. Sustainability is entirely related to innovation in its common orientation towards change and future: innovation intends to create new products and services with commercial value that fit into the future, which when combined with sustainability will extend its fields to people, to profit and to the planet thus achieving both social expectations and a fair distribution of values, maintaining the support of ecosystems (Crul and Diehl 2006).

Sustainable design is thus a strategic design activity for the purpose of designing and developing sustainable solutions, product and service systems that enable people to live better, consume less environmental resources and improve or regenerate their physical and social contexts (Manzini et al. 2001).

It is estimated that 75% of the environmental impact of a product throughout its life cycle is determined at the design stage and its development. In an attempt to minimize this impact Design for Sustainability is based on a methodology called Life Cycle Design (LCD). First it is determined the material and energy required for the extraction, processing and supply of the product, and keeps following the production phase, distribution, use (and possible reuse and recycling), and finally its disposal (Crul and Diehl 2006). Environmental impacts occur at all stages of this cycle in different ways, which must be taken into account in the design act: uncontrolled consumption of input materials (water, non-renewable resources, energy), output materials (water, waste, heat emission), as well as noise, vibration, radiation and electromagnetic fields. It is essential, however, not to overlook the phases of distribution, use and disposal, which often have a higher impact than production itself (Crul and Diehl 2006).

3.3 THE FASHION DESIGNER ROLE

As previously mentioned, the fashion designer presents itself as a key piece in the direction of sustainability. If it is true that one can predict the possible impact of a product at the time it is being designed, then it is the designer's responsibility to minimize this impact (Fry, 2009).

Research shows that aesthetic issues such as color, style, and price are stronger requirements at the time of purchasing a garment than environmental or social issues. It is, therefore, a challenge for the designer to understand consumer behavior patterns in order to understand how to involve him with the garment, adding meaning and value to it (Kozłowski 2014). To know consumer's lifestyle, it is necessary to acquire relevant knowledge through the observation, identification and analysis of trends of various social groups. Relevant social trends currently focus on the use of social media such as Facebook, Instagram, Tweeter and Blogs that allow creating virtual communities of connection, sharing and global communication (Kozłowski 2014), which facilitate the rapprochement between the creator and the consumer, recognizing their wishes and encouraging a change of behavior.

At its core, design can also become a tool to drive business innovation, products and ultimately sustainable consumption. Design agencies thus become powerful tools for social change through which relationships can be transformed and thus also affect the

transformation of the product and consumption system of which they are part. This new business model should break with the traditional model and integrate social and environmental issues into its strategies (Schaltegger et al., 2011). Giving the designer the power to integrate sustainability into the business core, brings to companies technological and organizational innovation with both principle and end-of-line returns (Nidumolu et al., 2009), reinforcing the idea that a sustainable business model is the key to the fashion industry competitiveness in today's global marketplace challenges (WBCSD, 2010)(Gobble, 2012).

Fashion designers have the power to avoid creating throw-away products, by designing not too trendy items; with high quality materials; possible to repair, reuse or disassemble. They can also make choices to prevent the excessive use of water, energy and chemicals, as well as the future care of garments. Having sustainability as goal, designers need to learn to design life cycles instead of products, increasing this way the life time of a product by design solutions (Niinimäki 2006).

It's the designer that will determinate "how the product will be used, how it will age, how it will be disposed of and what environmental impact the product will have (during manufacturing, use and after use)" (Niinimäki 2015), as well as the role of the consumer. By adopting co-creative strategies, the designer will act as the bridge between product and consumer, giving an active role to him that will increase the potential of the product, thus contributing to their longevity.

3.4 TOWARDS SUSTAINABLE FASHION DESIGN

Fashion is something that is always changing, on the contrary sustainability is about long-term perspective (Gardetti and Torres 2013), so, sustainable fashion design is really a complex field that demands for new approaches to the current design models, where psychosocial factors of consumption perform a major role.

When looking at the fashion industry as a whole, we realize that sustainability is still a secondary theme, and it is not effectively integrated into the design process (Gwilt and Rissanen 2011). According to Teece (2010) innovation is the best tool to ensure a sustainable competitive advantage and the best contribution to the necessary change in consumption and production patterns.

In the last decade sustainable fashion has been approached as a trend, focusing almost only on the reduction of waste, energy and chemicals used in the production phase, as well as

choosing materials with lower environmental impact (Gardetti and Torres 2013). While these topics are of great relevance, the impact generated by consumer in use phase shouldn't be left aside. The care given to garments during this phase (washing, drying and ironing) will have 75% to 95% of the total environmental impact (Sherburne 2009). So, several authors believe that, in order to achieve global sustainability, the solution is to shift the focus to the design process, and that the same companies that are responsible for the current production/consumption model can contribute to its change by creating products and services that better fit to this new demands and that, at the same time, influence behavior: inducing sustainable consumption and reducing the impact of use.

In spite of all of the impacts described before that must be taken into account, another big issue that arises with the beginning of the 21st century is the large amount of waste caused for all the current fashion system. Kate Fletcher (2008) has played an important role in the debate of sustainability in textiles and fashion, and believes that consumption patterns, globalization of fashion and fashion trends should be key themes in this debate. Strategies to extend use of garments over time, such as: long life guarantee and product satisfaction; product attachment and emotionally design; design services (Niinimäki and Hassi 2011); durable emotional design (Chapman 2009) have been discussed with the main goal of product lifetime optimization through a strong product-user relationship, that in practical terms will be reflected in care, maintenance and repair, postponing disposal (Brezet and van Hemel 1997). This kind of approach demands for major changes from both the economic and industrial system, especially in what concerns to fast cycle of production, fast-changing trends and planned obsolescence of products (Niinimäki K., 2015), as well as from the consumers and their purchasing habits, deeply related to impulse and short-term thinking (Joy et al. 2012).

A new radical way to create a win-win situation both to consumers and industry, and for sustainable development needs to be found, is to focus the research in understanding the reason that leads consumers to discard products that still work, to be able to come up with strategies and tools to help designers to design products more capable of deeper and more meaningful relationships with their owners. It looks like that the role of the consumer and his engagement is key to make consumption more sustainable (Nerurkar 2016). So, there is a need to better understand consumer expectations, needs and motivations in order to achieve sustainability in the fashion industry (Nerurkar 2016).

Chapman (2009) explains that consumer needs are mutants unlike the static experiences offered by most products, which leads to fatigue. Clothing is especially susceptible to psychological obsolescence due to the constant renewal of collections (Cramer, 2014), so Chapman (2009) adds that design for sustainability must predict not only the physical but also the emotional durability of the products. In regards to clothes that becomes a difficult task especially since the relationship with the consumer is too passive (buying and owning) and

lasting relationships are usually the most active ones, in this case when the consumer attaches to clothing in some way (Fletcher, 2008). This suggests a change in the way fashion is consumed and not only produced.

A great change in consumer behavior is observed throughout the last decades of the 20th century and in the 21st century is evident. The consumer has changed his concept of value by learning to value the quantity and devalue the resources needed to produce his goods. But it is also important to mention that the consumer can learn to make more sustainable choices (Kozlowski, Bardecki, and Searcy 2012). Many authors agree that it is by placing consumers at the center of the design process, providing them with knowledge of "environmentally friendly" behaviors, that fashion brands can develop better strategies that promote sustainable behavior (Connell, 2010). With an increasing massification of social media, it is increasingly easy for consumers to influence the design development process and marketing strategies. In this way consumers can interact, collaborate and co-create with fashion brands, since digital technology has dramatically reduced communication costs. The evolution of these media allows a better understanding of consumer behavior, their needs and desires, which makes it easier to integrate sustainability into the design process (Yoo et al, 2009).

Sustainable fashion design is more than designing a sustainable product and supply chain. It's only when establishing a relationship with the consumer that a better integration of the principles of sustainability is achieved. For this, it is necessary to foster an emotional relationship with it, and a new experience has a greater potential to increase the emotional duration.

In fact this participatory method is one of the oldest in the history of fashion. Bespoke consumers have always participated directly or indirectly in the design of the garment specially produced for themselves with high quality and detail, leaving in it their personal taste, and thus feeling connected with that valuable piece and carrying a unique shopping experience (Cramer 2014).

According to Fletcher (2008) it is through the open design method that more meaningful products / experiences can be created. Thorpe (2010) explains this method as one that allows users engage with designers in product development, although the mode and degree of participation can vary considerably. By participating in the design process, the user acquires tools and knowledge that can be used in the future and exchanged with others. The internet has proven to be the platform par excellence for this exchange of experiences and ideas, which has favored the development of new concepts (Cramer, 2014) and new platforms such as "The Internet of Things" (EC 2016).

3.5 PSS (PRODUCT-SERVICE SYSTEM) AN APPROACH TO SUSTAINABLE FASHION DESIGN

In response to the increasing environmental concern of the last decades, different production concepts have been developed: clean production, clean technologies, waste minimization, recycling, eco-design and design for sustainability. The product-service systems (PSS) design is presented as a new strategy to stimulate changes in production and consumption patterns, a new approach with the potential to minimize the environmental impacts caused by these (Mont, 2002).

Towards sustainable development, industrialized countries have to start with a considerable reduction in resource spending, which by the middle of this century should reach about 90% (Mont, 2002). The reality is that people are ten times better spending than using resources. About 93% of what is bought and consumed does not end up as salable products, in addition, 80% of the products are discarded after their first use, and the rest do not last as long as they should, actually it is estimated that 99% of them become waste in six weeks (von Weizsäcker, Lovins and Lovins 1997).

This problem could be tackled through a simple reduction of consumption, however, on the one hand, the populations of developed countries do not seem to show any will in this reduction, and on the other hand, it is important to increase consumption levels in developing countries only to provide them with basic comfort (Mont, 2002). The solution in the fight against the environmental impact, presented by several authors is based on the "dematerialization" of the economy, that is to reduce the flow of production and consumption material, creating products and services that give the consumer the same levels of satisfaction (Mont, 2002).

This means a "service economy" that focuses on optimization of use, contrary to the current "production economy", which focuses on technological progress. This strategic innovation provides for the sale of performance instead of goods, shifting the focus from the act of designing and selling only physical products, to the sale of a system of products and services that together are capable of responding to specific consumer's end desire, having "satisfaction" as value instead of individual physical property (Mont 2002; Tukker and Tischner 2004).

This change enables the companies to get closer to the customer. When selling a service - it is assumed that the user does not buy the product, but the result - the company undertakes not only the supply of the product, but also a continuous interaction in the use phase, through supply, maintenance and control until the end of its life, being also responsible for its recycling, re-use or disposal. Such involvement of companies in all stages of the product life cycle, which fulfill their services, creates an incentive to improve their lifetime and

quality. The customer, on the other hand, pays only the use of the product, instead of its acquisition, discharging the responsibility, risks and costs associated with the property, at the same time that their need is satisfied with greater quality and personalization. The loss of revenue from the exclusive sale of products can be offset by the sale of unique services that support these products, which are likely to be of longer duration and improvements throughout their life cycle since they are designed for intensive use. (Mont, 2002; Pawar et al., 2009)

The shift to a new reference model of product ownership led to new ideas and approaches in the development of PSS, such as: the sale of product usage as service instead of the product itself (Stahel, 1997), the change to a "loan Society", the substitution of goods through service machines (Shmidt-Bleek, 1994), or a "repair society" rather than a "throw-away society" (Mont, 2002). Each of these solutions presents itself as a separate element of a PSS, with all its strengths and weaknesses and with its possibilities and limitations for the minimization of environmental impact. Its introduction into a specific system will not imply mandatorily the reduction of this impact, quite the opposite. It is necessary, then, a Product-Service System which main focus is the solution of the system. To be sustainable, a system should, first of all, refer to a network of people, products, services and infrastructures that, as a whole, exist and reproduce sustainably (Mont 2002).

Although empirical studies show that in the current industrialized countries, where there are high levels of consumption, the penetration of new products and systems do not act as a substitute for the old but rather a complement, it is important to demonstrate the strengths and benefits of a PSS both in a corporate, social and individual level, as well as its obstacles.

Notwithstanding the strong motive of environmental impact, the PSS concept brings great changes in production patterns and especially in consumption ones, which will lead to more sustainable practices, societies and lifestyles. Its ability to facilitate understanding and influence the relationship between network and stakeholders provides the development of more efficient policies while creating new jobs.

This new approach will also modify the price system of the current economy. In the current model the consumer at the time of purchase is paying for an intangible service and not a material good, since the production cost is an almost insignificant part in the final cost of the product. That's why Product-Service Systems respond better to today's needs than the current mass-production system. Targeting this new concept then involves moving away from an economy of standardization and mass production to a flexible economy and mass customization, where markets are governed by quality and value added rather than commercial value (Vezzoli et al. 2015). Companies will have to change their traditional structure, marketing will take a leading position in narrowing the relationship between producer and consumer, and the treatment of all the resulting information will play a key role in the decentralization of decision-making that this system obliges (Mont, 2002).

The truth is that there are several obstacles to the development of a PSS, of which we can highlight: the need to involve several stakeholders, sometimes the need to create infrastructures and new networks, change of the current sale model (the point of sale will become the service point), cultural changes and of the traditional market concept, and, last but not least, the reluctance of consumers to consume and to own less, since considering that people only looks at the function of the product and not at the product itself, does not represent properly the reality (Baines T. et al., 2007).

It is important to note that not all PSS models are indeed sustainable or eco-efficient (Vezzoli et al. 2014). Many models based on rental and/or lending systems become unsustainable due to the environmental costs involved in transportation throughout the product life cycle, which makes this system unfeasible in the long term (Vezzoli et al. 2014). Thus, it has become imperative to define Sustainable Product-Service System (S.PSS) as:

“the design of the system of products and services that are together able to fulfil a particular customer demand (deliver a ‘unit of satisfaction’) based on the design of innovative interactions of the stakeholders (directly and indirectly linked to that ‘satisfaction’ system) where the economic and competitive interest of providers continuously seeks both environmentally and socio-ethically beneficial new solutions.”

(Vezzoli et al. 2014)

Vezzoli et al. (2015) argues that radical innovations are needed in setting up relationships in a system. On one hand there is a need for new interactions and partnerships between different stakeholders, on the other new sustainable relationships between consumers and products. So if the aim is a new fashion system model, both design and business radical innovations are needed.

Niinimäki (2012)(2013) and Niinimäki and Hassi (2011) pointed in different studies that these innovations refer to products, services or processes that offer value not only for both the consumer and business but also for the environment. Such innovation can be seen in different levels, as Brezent and van Hemel (1997) have explained: small, incremental improvements on existing products; major redesign for existing products; new products or services concepts; system innovation; and design for a sustainable society (Niinimäki K., 2015).

As Bocken et al. (2014) mentioned PSS are used-oriented business models, where the contribution is a change in consumer behavior via social innovation, especially in reducing the need for ownership, what will significantly impact on the reduction of product volume and the creation of innovative waste elimination methods. However, in the fashion field, when considering a use-oriented clothing economy it's important to realize how this will influence the consumer perception and will of adoption, once, as Verganti (2009) stated, consumers are deeply engaged with the existing solutions and socio-cultural regimes they know, making the implementation of different, radical concepts difficult to adopt. Hirschl et al. (2003) add that

clothing may be a means of self expression, in which ownership may have a strong emotional meaning, what will hinder a service solution, since some functional offers from a PSS may seem unattractive when the point is to achieve status or control (Armstrong et al. 2015).

A study run by Armstrong et al. (2016) revealed that even if consumers are reluctant to give up on the joy of personal ownership and accumulation of clothing, they are aware that there is a need to purchase less and use their own clothes more, however it's difficult to keep interest with almost every product for long periods of time, because peoples' needs and even identity is also changing. People will more easily build stronger relationships with products that meet their changing needs, a service system may be a key. According to Secomandi & Snelders (2011) moving from a product-based society to a service-based one the world economy will rely on services for labor and value creation, what will change the way all industry works.

Profit in industry is synonymous with material consumption, in the fashion industry this concept goes even further. It is a challenge, then, for apparel vendors to commit with waste reduction and prioritization of long-term products through increasing levels of consumer satisfaction with less material consumption . As demonstrated earlier, the PSS business model is presented as the next logical step toward cleaner production products and processes (UNEP) (2002), in what concerns to the fashion industry it will be reflected in a long-term contact with the consumer, and the development of collaborative networks organized with a multiple stakeholders supply chain, and low capital.

The reduction of material consumption will have a very significant impact on a company's revenues, or at least modify their origin. This model presents alternatives for profits from dematerialization, focusing especially on complementary services offered to the consumer (Mont 2002) and the relationship that will create with this until their loyalty, which will be difficult for competitors to replicate (Tukker & Tischner, 2004, Van Halen et al., 2005). On the other hand, the connection maintained with the consumer will provide the company with important information and details to generate innovation and market receptivity (Tukker, 2004; Tukker & Tischner, 2004; Van Halen et al., 2005).

One of the main barriers to the implementation of the S.PSS model in the fashion industry is essentially the elimination of the sense of belonging, only by the satisfaction of the necessity, in this case of being dressed, when in what concerns to fashion, owning a product is often synonymous with status, especially when referring to luxury brands. Even so, there are models that, even if they are not perfect, find themselves in a very positive and innovative way.

3.6 PARTICIPATORY DESIGN AN APPROACH TO DESIGN FOR CIRCULARITY

The circular economy is on the agenda of every and each business, the textile industry isn't different. It predicts an economy where tomorrow's resources are from today's goods, a cycle that fosters prosperity in a world of finite resources (Yuan, Zengwei; Bi, Jun; Moriguchi 2006).

Traditional linear economy has been the dominant model since the Industrial Revolution, and has focused on a "take-make-dispose" system that is jeopardizing natural resources and will eventually conduct the planet to a catastrophe. However, a transformation to a circular economy is not an easy or quick task.

The circular economy term was used formally for the first time in the 90's (Rizos, Tuokko, and Behrens 2017). Its definition has been suffering some changes, and in the last couple of years it has been addressing mainly the physical and material resources of the economy, focusing on the reduction of primary resources consumption, by recycling, re-using or upgrading of waste (EEA 2014), as well as keeping the products in use longer, extracting the maximum value from them (Mitchell 2015). Some other authors are also claiming for an introduction of other themes in this debate, such as energy efficiency and conservation, land management, soil protection and water, as well as the potential to the improvement of the entire living and economic model (Rizos, Tuokko, and Behrens 2017).

Rizos, Tuokko and Behrens (2017) have identified with basis on other authors the three main circular economy processes - use less primary resources; maintain the highest value of materials and products; and change utilization patterns, as outlined in next figure. It is important to notice that these categories are not mutually exclusive and that their elements are often interlinked, in fact strategies involving multiple processes are also possible. Many process changes through circularity will not only affect the directly involved ones but will also have a great impact on the complete value chain. Hence, significant changes are expected in economic, environmental and social level; however, these implications weren't discussed in literature yet.

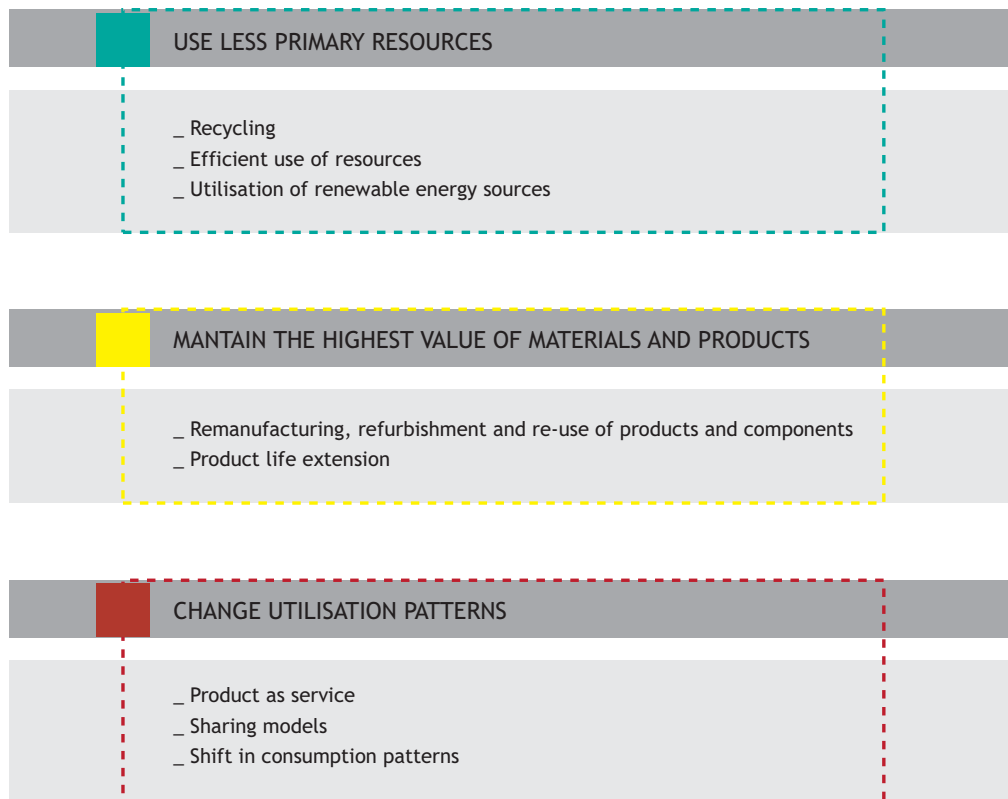


Fig. 1 Circular Economy

Source: Rizos, Tuokko, Behrens (2017)

Some strategies of participatory design will put into action the concept of circular economy in the textile and fashion industry. Some will be explored throughout this subchapter, presenting, whenever possible, practical examples of companies that have already incorporated such strategy into their business model. The next figure is an example of a new system for circular fashion.

DFC

Design For Circularity (circular.fashion) stands for a circular future of fashion.

Their aim is to create a closed loop platform where material developers, circular design, circular retail models and recycling technologies will be interconnected for transparency and flow of information.

The platform is still being developed but seems very promising.



Fig. 2 DFC logo
Source: circular.fashion

3.6.1 PRODUCT DESIGN AND PRODUCTION

The current fashion business model is driven for a faster ever-changing production phase (Alastair and Hirscher 2013) in order to keep up with new trends and consumers desires.

As Niinimäki (2013) pointed, “most clothes purchases are driven by a need to fulfill emotional desires or vanity needs rather than a real need for new clothing”. This type of purchase rarely contributes to a truly relevant experience capable of creating attachment between the product and the consumer. In the opposite experiences that involve investment of something from the consumer, establish a bond that last much longer (Cramer 1999).

“By shifting the focus to the design process, products can be designed to influence consumer behavior, induce sustainable consumption, and reduce impact from use”(Kozłowski 2012).

Adding services to the design and production phase of a garment isn't really a new thing; in the past made-to-measure was a regular option. With this service, the customer used to be an active part of his garment since its design, the fact that he may have waited quite some time for it and pay a higher price creates naturally feel of connection. For the same reasons these products were well taken care and repaired when needed (Cramer 1999).

Nowadays, there is several numbers of consumers returning to the engaging process of that business model due to the possibility of having a different product, customized and made especially for him. With Internet and digital technology, this kind of business has evolved and spread globally (Cramer 1999), which is a win for both customers and brands. To the firsts ones is offered a perfect fit, both physically and emotionally, which predicts a longer product life (Niinimäki and Hassi 2011); to the brand these techniques enable savings in materials and stocks, once production depends on existing orders (Niinimäki 2009).

This sub chapter will presented some design strategies that could be applied in the design and production phase to create scenarios that facilitate this connection.

CO-CREATION

One method for fashion brands to create value is through interaction. By understanding consumers will be easier to identify opportunities for value creation (Kozłowski 2014).

Once products answering to specific needs and desires are more likely to be meaningful for a long period of time, are thus more difficult to detach from (Niinimäki and Hassi 2011). To better answer to this customer's needs and values, customers should participate in an open-ended design process and in an open-source design system, to feel engaged within a collaborative action, contributing to the creation of emotionally durable design.

Consumers should become co-creators, changing the current relationship between consumer - designer - fashion product (Kozlowski 2012). With an active role, they will more easily develop a sense of attachment with the product, emotional fulfillment and satisfaction. The effort to be part of the design or production process contributes to a strong sense of achievement, that will be always linked to the product and giving it extra value. This positive experience will be reflected in the product contributing to longer its lifetime (Kirsi Niinimäki 2009). Some examples are referred in the following figures.

MODCLOTH

“Be the Buyer” is a co-creation strategy adopted by Modcloth.

The company gives their customers the chance to vote for their favorite models to be produced and even share some tips with designers.

Such kind of program allows customers to be more involved, feel heard and valued. At the same time the company offers their clients exactly what they wish (consumer value creation 2015).



Fig. 3 Be the Buyer from Modcloth
Source: modcloth.com

BURBERRY

Burberry, an iconic luxury brand, also saw in co-creation a way to be closer and connected to their customers. Together with salesforce.com they re-invented the interactions between store’s sales, service people and customers as a mini-community.

The Burberry platform unleashes mutual emotions and shares important data with both the brand and the customer. Once again, the customer feels engaged with the brand, he may be asked to give suggestions on a new product or participate remotely on a fashion show. The brand will win by getting the feedback the customer shares directly with it or in social media with others (Gouillart 2012).



Fig. 4, 5 & 6 Burberry and salesforce
Source: burberry.com

CUSTOMIZATION

The customization strategy allows models that combine products and services to be capable of fulfil consumers', manufacturers' and other stakeholders' expectations and satisfaction. There are interesting solutions, specially linked with on-line purchases of customization. This kind of solutions, so far seem focused to sell more products, and not to really offer a role in decision-making to the costumer (Niinimäki 2011b) once they are deeply related with small changes (e.g. colors, style, etc.) but, its potential towards CPA (consumer-product attachment) it's undeniable.

Personalized or customized products favor the creation of a deeper emotional connection with the consumer. Allowing the consumer to add personal meaning to the product facilitates the feeling of attachment (Chapman 2009).

There are several mass customization options in the web, two examples are given in figures 7 and 8. These options use fast, flexible and digital manufacturing technologies associated with computer-aided design (Niinimäki and Hassi 2011).

APPALATCH AND UNMADE

Appalatch (<https://appalatch.com/>) and Unmade (<https://www.unmade.com/>) are two brands dedicated to 3D knit sweaters made on demand.

The first one works on-demand with collection products. They are offering the possibility to have a local, environmental friendly high quality product.

The second one is an on-line platform that works with other innovative brands allowing their costumers to be able to design their own sweater defining its style, pattern and color.

The costumer will feel unique with a product that it's what he wanted, made specifically for him; the experience of being part of the process and having the power to choose, added to a product that answers to specific needs and desires, has great potential to guarantee a long-term relationship. On the other hand, the brand avoids stocks while is always aware of consumers' preferences.



Fig. 7 Appalatch Logo
Source: appalatch.com



Fig. 8 UNMADE for Farfetch
Source: unmade.com

OPEN SOURCE

Open source fashion is another way of co-creating and the result of the new digital era. In this kind of strategy, the designer sells his skills through patterns and instructions, but it's the user that does the construction itself.

The consumer leaves his passive role to become an active maker, with a leading role in decision-making. For this reason, this kind of design strategy is not led by large companies or retailers (Niinimäki and Hassi 2011).

Open source is also a community's shared system, where small contribution of each can plug into each other, what contributes to its vitalization (Busch 2008). Most of all this kind of strategy contributes to personal, social and communitarian empowerment, while creates a deeper connection between products and people. Figure 9 presents an example.

THE LIVING WARDROBE

A great example to this model is the project "The living wardrobe" from Jo Cramer.

In this project garments are designed to have multiple lifetimes by repair, update, remodel, share or second hand sale. But the real novelty is that the author is exploring a participatory system that encourages the consumer to interact with the garment over time, acquiring at the same time skills and knowledge. Garments will have a QR code attached that links to a webpage where specific information about each style and possible transformations is available. The user will not only get a product that fulfill his needs, but will also be feel empowered (Cramer 2014).



Fig. 9 The Living Wardrobe
Source: jocramer.com

HALFWAY PRODUCTS

Another strategy that in what concerns to users' involvement is very like the last one is the concept of halfway products. "A halfway product is designed as unfinished by intension, it thereby leaves the end-user an open space to customize and finalize the piece"(Alastair and

Hirscher 2013). When designing this kind of products designer can make it easier for the user to get involved and achieved the expected result easier and with basic skills (Alastair and Hirscher 2013).

Products are provided in kit-bases, enabling the users to be the builders and develop inner knowledge about the product, which may be a key factor in order to be able to repair it in the future, if needed. With this method, the user adds his preferences, creativity and even memories to the product, and experiences a deeper connection with it as result of his effort (Niinimäki and Hassi 2011). On the other hand, a kit-based product is designed for disassembly and reassembly of modules, which offers great possibilities for evolutions in time: upgrading, modifications and repair, as well as less laundering (Fletcher 2008). An example is given in figure 10.

MAKE{ABLE}

Make{able}

(<https://makeable4u.wordpress.com/workshops/half-way-clothing/>) is defined as open collaborative project that encourages everyone to become active makers of their own wardrobe.

They perform half-way clothing workshops that offer customers an easy start with sewing, while creating real unique design pieces for themselves. The customer/maker will be able to customize and finalize unfinished designer products they have, becoming an active participant of the design process.

Make{able}
Valuable clothes designed together.



Fig. 10 Make{able} Workshop
Source: makeable4u.wordpress.com

3.6.2 PRODUCT USE

It is estimated that the use phase of a product is responsible for 75-95% of its total environmental impact (Sherburne 2009). Moreover, this is the phase of product lifetime we have less information about both use, care and consumer-product relationship, although this is a critical phase to understand product replacement (Mugge et al. 2010).

Even if services added to the product at the design phase are promising for its life extension, as seen before, only a shift to a business model that combine services with products through all lifecycle will allow a deeper knowledge of the consumer and will monitor their changing needs.

Changing product value to use value will create new opportunities laid in product quality and durability (Mont 2002), with consumer satisfaction at the center of focus. This means adding services that will promote product lifespan through upgrading, updating or repairing. Most of all, these services postpone the psychological obsolescence of the product (Niinimäki 2011). On the other hand, also services as renting or leasing could also offer innovative relationships consumer-products-brands.

This subchapter will present some design strategies that could be applied in the use phase to create scenarios that facilitate extending life of products and prevent premature obsolescence.

UPGRADING

Services that offer the possibility of upgrading a product have great impact in extending product lifetimes through satisfaction.

As said before the main cause for fashion discard is related to changing needs and aesthetics preferences, so a service that offers the possibility to redesign or to modify the product allow to reverse this premature obsolescence. Furthermore, these services offer new business opportunities on a local and global level (Niinimäki 2012). This kind of services can work together with strategies like halfway products and open source to get more value. An example is illustrated in the following figure.

RECYCLOPEDIA

A very interesting project that mixes the open-source strategy and upgrading is Recyclopedia, from Otto van Busch.

In this project step-by-step tutorials on how to update the garments dying in the wardrobe are suggested. A library of documented methods of updating clothes could be downloaded and printed from the platform, by anyone and developed as a DIY project (Busch 2008).



Fig. 11 The Recyclopedia website

Source: Otto Van Bush - Fashion Hacktivism

REPAIR

Repair services were very common in the past, but once fast-fashion spread all over, poor quality of materials and cheapness of products have made it no longer worth to mend. Moreover, in the new generations there is a lack of skills to carry minor amendments, so that is an increasingly less frequent act, and most often limited to small tasks like sewing a button (Holroyd 2013). Even with a pay service for repair people feel reluctant with this solution due to a social stigma, feeling fear of being seen as poor (McLaren & McLauchlan 2015).

To contradict this tendency some repairing projects are emerging, once repair is one of the best and easiest ways to give value to products that are no longer in use and avoid its discard. Ones are focusing in return basic skills to costumers while others in taking advantage of damage to upgrade the garment, as exemplified in figures 12 and 13.

REKNIT REVOLUTION

The Reknit Revolution (<https://reknitrevolution.org/>) run by Amy Twigger is a project where mending stays visible by choice in any kind of knit pieces and is made by the costumer.

The mending is converted in an updating or upcycling, and once the consumers sees it like a new piece, the repair process is worth it and less pejorative, at the same time the costumer gain new skills and feel more confidence about the work.



Fig. 12 ReKnit Cardigan
Source: reknitrevolution.org

LYC

Love Your Clothes (LYC) was a public event that happened in Scotland in 2014 run by McLaren & McLauchlan. The main purpose of the event was to educate the consumers to engage with older products through repair and show how this strategy can empower not only the garment but the owner itself.

This project has become a platform (<http://loveyourclothes.org.uk>) to help raise awareness to do better clothes - choices and buying, care and repairing, refashion and upcycling, and discarding.



Fig. 13 Love Your Clothes website
Source: loveyourclothes.org.uk

RENTING AND LEASING

Renting and leasing are used-oriented services characterized by a lack of personal ownership - companies retain product ownership and consequently its responsibility, (Niiniäki 2015) while costumers only pay for the use of the product. This kind of strategy “allows products to be used more intensively, which reduces the number in circulation and the use of the old, inefficient models, and removes a supplier’s incentive to curtail life spans” (Cooper 2005). At the same time suppliers must design better products, take care of them longer and find creative solutions for product’s end of life. Indeed, product renting involves sequential use by different consumers which may contribute to a less careful behavior and therefore lead to higher impacts, while leasing involves a single consumer that is only paying for the use of the product (Tukker 2015). These strategies are well disseminated in products like cars or videos, but in fashion and textiles are only now having a substantial growth, once fashion products are intimate and issues like hygiene are raised. Figures 14 and 15 present some examples.

CHIC BY CHOICE

Chic by choice (www.chic-by-choice.com) is a Portuguese company that rents luxury dresses from well-known brands and designers to special occasions, such as weddings, cocktails, proms, etc.

Even if sustainability isn't in the core of its value proposition, the truth is they avoid purchasing of short-term use product.

The customer only pays for the use of the dress. The company is responsible for its repairs and laundry.



Fig. 14 Chic By Choice website
Source: chic-by-choice.com

MUD JEANS

Mud Jeans (www.mudjeans.eu) is a dutch company that offers a leasing contract for jeans made of organic and recycled cotton. On the first purchase the customer pay a €20-member fee, then he can choose his jeans for a €7,50 monthly fee with one year duration. In the end of this year he has three options: keep the jeans, switch for a different model (keeping paying the €7,50 fee), or send it back to the company and receive a €10 voucher to use on a next purchase. The company is responsible for the recycling of jeans, so this strategy allows them to stay the owners of the raw material, getting them after use. The user is paying for the use and is able to change the product according to his changing needs.



Fig. 15 MUD Jeans
Source: mudjeans.eu

3.6.3 PRODUCT DISCARDING

One of the main concerns with the current fashion system is the excess of textile waste created daily all over the world: both at industrial level, with defected items to flood daily landfills; at stores level, with clothes leftovers that weren't sold due to a saturated market; or at consumer level, with products with short-life span.

It is known that if clothes were worn for another nine months than what they are, making a total lifetime of about three years, a 20-30% reduction on carbon, water and waste footprint would be reachable (McLaren & McLauchlan 2015). So, end-of-life strategies are as much important as design and use ones. In that sense reuse, recycle and upcycle strategies are being integrated in new and old business models, and are key approaches towards a sustainable fashion system. This sub chapter will be focused on them.

RE-USE

Re-use is, above all, the redirection of discarded products, that are still in great shape, to new owners, without needing any repair intervention (Goldsworthy 2012), is use second-hand products.

Even if this concept of second-hand isn't new in retail, there is some social stigma related to it. So, changes in consumer behavior are still needed to support new business models.

Brands are focusing in the re-use concept to strengthen the relationship they have with existing customers and, also, to reach new markets. Take-back schemes have been implemented in-stores, supported by resell/reuse platforms. This kind of approach is mainly chosen by premium and high fashion brands with higher quality products.

Reuse should be a key theme in brand strategy towards sustainability, that is the first step towards brand's responsibility for the end-of-life of their products (Hvass 2014; 2015). The following figures give illustrative examples.

FILIPPA K.

One of the first retail brands opening its own second-hand store was Filippa K, a Swedish company with a philosophy built around core values like style, simplicity and quality.

They have been focusing along the years to produce trends free, quality clothes, which brings great opportunity for long-term clothes as well as for reuse (Piegsa 2013).

Back in 2008 they opened an exclusively Filippa K. second-hand retail store in collaboration with Judit's Second Hand, a successful consignment second-hand store in Stocklom.

They are currently developing a system that allow all Filippa K. stores to accept take-back products and working to spread the concept to other second-hand stores (Hvass 2015).



Fig .16 Filippa K. Logo
Source: filippa-k.com

KID TO KID

Kid to Kid (www.kidtokid.pt) is a brand that may be found both in USA and Portugal, dedicated to second hand baby and children clothes and goods.

Parents can sell their children clothes and goods, when in very good condition, and can also buy second-hand products.

The brand provides economic but also environmental savings and strives to maintain a close relationship with its customers in order to also educate them.



Fig. 17 Kid to Kid store
Source: kidtokid.pt

UPCYCLING

The main goal of upcycling is to provide a solution to waste, “by optimizing the lifetimes of discarded products from an inefficient system” (Han, Tyler, and Apeageyi 2015), in other words, to give value to waste (Richardson 2011).

In what concerns to fashion design, upcycling means creating products with greater value from textile waste, a concept that gives both designers and consumers the opportunity to increase satisfaction (Han, Tyler, and Apeageyi 2015)(Sung, Cooper, and Kettley 2016), while being environmental friendly.

There is a different approach to upcycling if done from consumers’ or brands’ point of view. For this work it is important to distinguish them, since they have different results regarding attachment.

For both players design is the agent of transformation (Goldsworthy 2012), however individual upcycling provides for more active consumer involvement, whether in design alone the focus is in the physical transformation. As in previously presented strategies, this favors the attachment consumer-product due to the experience coming from the work itself as well as the resulting learning. From the environment point of view is also the best approach, once avoids transportation and could save more embodied energy (Sung 2015).

The main advantage that companies and brands have to upcycle, face to consumers is the ease of access to other textile waste in addition to the used products, i.e. production waste, returned defected products or even leftovers from stores (Aus 2011).

Upcycling, as brand initiative, is usually related to reinvigorate the old into something new. With a great design component, this method offers the customer a uniqueness feeling, supported by one-of-a-kind product, very like to a customized one (Piegsa 2013) which presents a huge impact in CPA. It should be noted that the uniqueness offered by upcycling, and so value for attachment, has an inconvenience in terms of replication, that is the fact it does not offer choice in terms of size, and hence cannot respond all consumers (Aus 2011).

The following figures illustrate these approaches.

ALABAMA CHANIN

Alabama Chanin is a company with a simple philosophy: “use local materials and local skills to create garments that can meet the ambitious biography of ‘Hand-sewn in America’”(Hemmings 2010).

With a production that does not aim to mimic the mechanical processes, the garments are hand sewn by local women, inspired by the local quilting tradition, using fabrics from local thrift stores and more recently from the Salvation Army (Goldsworthy 2012).

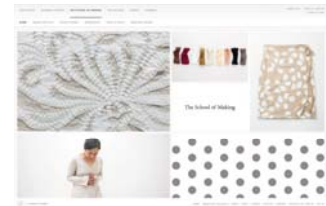


Fig. 18 Alabama Chanin website

Font: alamabachanin.com

ANTIFORM

Antiform (www.antiformonline.co.uk) take over as a fashion company that is pushing the boundaries of ethical, sustainable design by using reclaimed materials and mixing fashion forward shapes with heritage craft.

All materials and workmanship involved in their production is as most local as possible, and all from England.

The customer will get the uniqueness of an upcycled garment or accessory.



Fig. 19 Antiform website
Source: antiformonline.co.uk

RECYCLING

Recycling is the last strategy presented in this work, because it should also be the last strategy for textiles.

Recycling leads to a recycled product or to a recycled material, as for instance in the textile industry may lead to a recycled fiber. It can also lead to an upcycled product or to a downcycled one (Niiniäki 2015), once that even if in the first recycling it is possible to obtain a quality product, the truth is that after repeating the process for sometimes the quality is lost to the point of being impossible to do it again (Goldsworthy 2012). On the other hand, recycling also implies high environmental impacts resulting from re-manufacturing processes and transport.

Recycling demands for mono material products, that is products that are made from one material only; or disassembly easiness, which for the fashion industry, in particular, are not very common practices (Niiniäki 2015). Despite this, recycling is a strategy to consider to reduce and give new value to textile waste. However, if recycling it's one of the end-of-life possibilities, materials choice and assembly are important issues to discuss prior to the first production if recycling it's one of the end-of-life possibilities, once some materials will have better performance than other in this process, and disassembly costs could be avoided.

Two examples are referred in the following figures.

PATAGONIA

Patagonia (www.patagonia.com) is an outdoor fashion company that has as mission “build the best product, cause no unnecessary harm, use business to inspire and implement solutions to the environmental crisis”.

Patagonia uses a closed loop strategy as business model, with extended life of products as main goal. So for instance they allow their costumers to send products back to factory to be repaired, or takes back their own products to be recycled into new fiber material.

The company has a strong message to share with their costumers and can create a deep engagement with them.



RECOVERTEX

Recover System (www.recovertext.com) offers a closed-loop solution for end-of-life textile waste management, and a truly sustainable fashion industry.

Textiles made from Recover Yarns can flow through the Upcycled Textile System for many life-cycles. Recover creates long-lasting, high-value products in each successive generation of products.