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“How can the role of the designer and consumer adapt to create sustainable strategies for the future of cloth?”

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Summary of topic

This independent inquiry outlines the key waste issues that surround the textile industry by evaluating the environmental impacts the industry has on the planet. It illustrates how innovative contemporary designers are creating new products to reduce waste and develop harmony between resources and production. The text investigates the vital role between the manufacturer and consumer and discusses how collaborative relationships are being developed to enable a more responsible and sustainable future. The Ellen Macarthur Foundation have developed an alternative circular economy model which I later discuss that is more suitable to the twenty first century and effectively reduces waste.

Introduction

This independent inquiry outlines the key waste issues that surround the textile industry and the detrimental effects the industry has on the environment. Chapter one highlights environmental concerns about waste, which is a byproduct of the textile industry, it also looks at how designers are creating innovative solutions to be more sustainable. This research is supported by theorist Michael Parlyn who discloses that textiles is a “power intensive industry.” (Parlyn, 2016, p.71) The Ellen Macarthur Foundation have created a Circular Economy model which is more suitable for the twenty first century, the aims of a circular model are to design out waste completely. “Climate change remains one of the greatest challenges of our time.” (H&M group 2019) Making it a key challenge for the textile industry to adapt their current sustainability ambitions and work towards designing out waste. Sustainable design minimises pollution, reduces the mass depletion of raw materials, natural resources and reduces energy consumption required to make textiles.

McDonough further explains the importance of redesigning systems that subvert linear production to add value to waste by regenerating materials. According to McDonough “we need to stop trying to figure out how to be less bad and start figuring out how to be good.” (McDonough, 2002, p.14) This can be achieved through working in an alternative structure such as The Zero Waste Textiles factory in India that embraces circular economy. The factory has successfully used biomimicry as a design discipline. The research suggests that biomimicry can positively influence manufacturing systems and transform the textile industry holistically. Contemporary designers such as Suzanne Lee are working innovatively to reduce waste and create new materials that are less harmful to the environment. These new developed materials offer an alternative to petrochemical and raw materials that are currently excessively used.

Chapter two highlights the issues that fast fashion has on the environment and suggests that the role of the consumer needs to actively change within the system to reduce waste. The idea of brand stewardship is currently being developed as a leadership role which can help reduce waste whilst sustaining the brand. The role means they are accountable for their products after the sale which supports the regeneration of materials and closes a loop within the system. H&M and Oxfam have both put active schemes in place to reduce waste and encourage consumers to alter their behaviour. The role of the consumer and brand must have an active role in waste management by taking a more responsible attitude to textile goods and not disposing so much so frequently.

By looking at Theories of Consumption by Hugh Mackay he demonstrates that mass production has enabled a devalued material culture and disconnect with the origins of clothing. It is important to take a slower fashion approach on an individual basis which could be achieved through repair, a suggested strategy for waste management. According to Kate Fletcher “reusing textile products brings significant environmental savings” (Fletcher, 2008, p.100) as less energy is needed. Currently, repair is gaining momentum and the brand Toast are using repair as a way to take a sentimental approach to clothing whilst supporting and sustaining traditional textile techniques. “To help foster longevity we offer a free repair service... customers are encouraged to bring back Toast garments.” (Toast 2019) Research shows that repairing offers a skill sharing opportunity that also adds value and authenticity to clothing and connects the wearer and the product.

Chapter 1 - Environmental concerns and creating innovative solutions

The production of textiles has always been key to the British Industry since the beginning of the 18th Century. Textiles was identified as a “catalyst of technological changes during the industrial revolution.” (Lumen Learning, 2019) The industry drove ground-breaking scientific innovations such as the flying shuttle which was a key factor that increased the volume of production. It changed the way clothing was made from manual to machine production allowing clothing to be produced much faster at a lower cost consequently this increased demand. From this period onwards mass production and fast fashion accelerated. Repeat patterns were used as a way to generate imagery on garments at speed and could be done effectively through manufacturing. This process replaced custom made bespoke clothing to rapid clothing production which we currently see on our high street where garments are increasingly disposable.

Karl Marx theorised the commodity culture created through capitalism in the nineteenth century and in a recent text by Shahidha Bari she discusses Marx theories and states that “as the rapid production cycles of fast fashion render our garments increasingly disposable, it seems more important now than ever to pause and reflect on our clothes.” (Bari, 2019, p.16) This demonstrates that to date fast fashion is still a pressing issue. There are concerns about the fashion industry and the moral obligations of the system are being questioned due to environmental pressures. Molly Martin recently discussed in an interview that the fashion industry is currently revolved around “consuming, buying and throwing away at the same rate.” (The Vendeur, 2019)

Currently most textile manufacturers follow a linear economy structure. The system relies on being a money valued cycle. It is “...massively wasteful of both raw materials and finished products, elements and consequences outside the money

valued cycle are costs loaded onto the environment and society at large.” (Webster, 2015, p.9) If designers and manufactures research the system closely it is clear to see how parts influence one another and how detrimental they are to society with absence of control.

Originally most of our textile goods and clothes were made and sold within the UK although, they were dependant on fossil fuels especially coal. However, sustainability factors had not been fully established and the dangers that the textile industry had on the environment were not known fully at this time. The need for “...manufactured goods was greater than the supply.” (Campbell, 2013 p.15) It opened a gateway to allow people to buy more clothing at affordable prices.

Issues surrounding sustainability have now been established in the 21st century, designers must provide alternative solutions to drastically reduce environmental impacts. Currently, the textile industry contributes huge amounts of waste to landfill. WRAP a company which is a catalyst for sustainability works in-between businesses and government recorded that “...£140 million worth of clothing goes into landfill each year.” WRAP (2018) To see change in the quantity of textile waste large companies must concentrate on manufacturing more responsibly. Whilst small businesses can reduce waste effectively and recycle fabrics, the scale is small and for us to see a global change, textile manufacturing as a whole must evolve holistically to become less harmful to the environment.

Parlyn’s research shows that “textiles is a water and power intensive industry.” (Parlyn, 2016, p.71) Currently (BCI) Better Cotton Initiative state “it can take 10,000 litres of water to produce 1 kilogramme of cotton fabric.” BCI (2018) These figures can no longer be ignored action is required to make this process more sustainable. Chemicals and dyes used to process fibres such as cotton are extremely harmful to the environment and often effect public waterways preventing clean drinking water and effecting wildlife. Whilst alternatives such as organic low chemical cotton could offer a solution, other fibres both natural and man-made including “...flax, hemp and

lyocell benefit the environment by reducing pesticides in water.” (Fletcher, 2008, p.4)
Using alternative fibres offers a solution to cotton which is being exhausted and benefits water quality.

An alternative to linear production would be circular economy. Within the textile industry circular systems are gaining momentum with pressures such as climate change there is a consequent feeling of social responsibility. The main aims of the model are to “design out waste, reduce pollution, keep products and materials in use and regenerate natural systems providing concrete solutions for the future.” (MacArthur, 2016) The manufacturing model pictured in figure 1 works in cycles waste is used as an input to generate energy, create new materials, or filtered back into the cycle. To work to a circular future, it is important to change the linear manufacturing cycle “...here’s where redesign begins...” (McDonough, 2009, p.18) McDonough and Braungart express redesigning systems is integral to positive change in their key text from the 21st century Cradle to Cradle.

OUTLINE OF A CIRCULAR ECONOMY

PRINCIPLE

1

Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows
ReSOLVE levers: regenerate, virtualise, exchange

Renewables    Finite materials
Regenerate Substitute materials Virtualise Restore

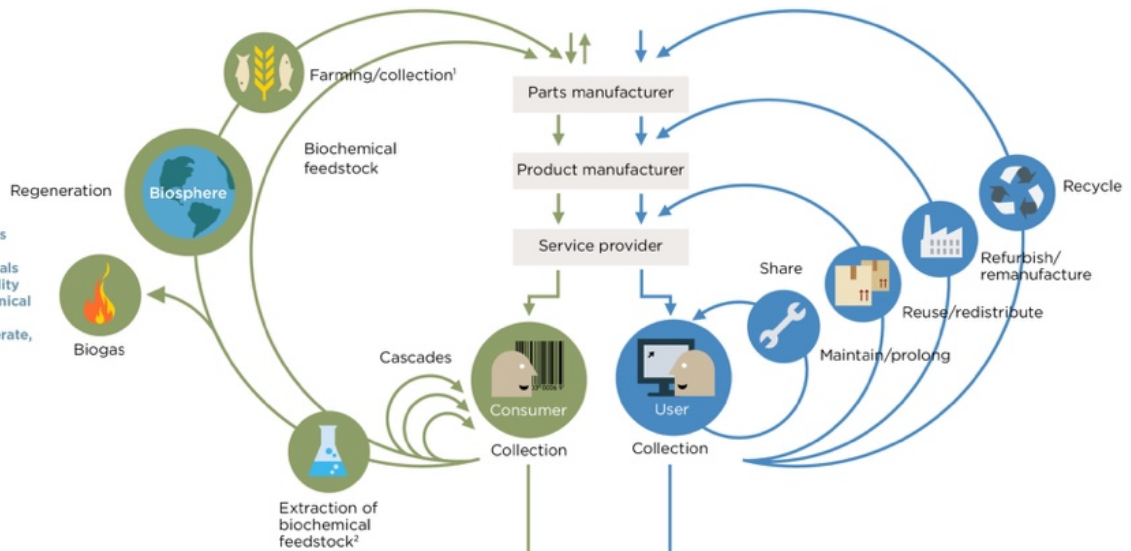
Renewables flow management

Stock management

PRINCIPLE

2

Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles
ReSOLVE levers: regenerate, share, optimise, loop



PRINCIPLE

3

Foster system effectiveness by revealing and designing out negative externalities
All ReSOLVE levers

Minimise systematic leakage and negative externalities

1. Hunting and fishing
2. Can take both post-harvest and post-consumer waste as an input
Source: Ellen MacArthur Foundation, SUN, and McKinsey Center for Business and Environment; Drawing from Braungart & McDonough, Cradle to Cradle (C2C).

Figure 1- Circular economy system diagram

Designers are now beginning to implement this model within their practice. The circular economy model has been influenced by nature. Biomimicry is “the examination of nature and its models’ systems and processes, to emulate or take inspiration from nature in order to solve human problems.” (Smith, R 2018) The circular system finds connections to solve waste by keeping materials at the highest value. It looks to the ecosystem to provide answers to sustainability issues as the natural world is the most sustainable system, it provides outputs and inputs of energy. In order for future generations to achieve equilibrium between resources and production designers need to reassess models and look to nature for inspiration. Quinn explains that “...The science of biomimicry studies animals and plants and their behaviour and models to be adapted for human use by teaching man kind to

mimic the world.” (Quinn, 2010, p.111) By becoming more resource efficient and incorporating biomimicry within manufacturing and design, waste should decrease. In figure 1 the diagram shows how waste is inputted back into the cycle, by regenerating materials, redistributing and remanufacturing products so they can be kept at their highest value.

With new factors being addressed in the design process such as (DFR) Design For Recycling and (DFD) Design For Disassembly supports recycling by avoiding glues which are often unnecessary. Glue is used to package and send textile products to consumers and can become a complex issue when trying to recycle. It contributes further to waste and is not regenerated back into the system. (Earley, 2012, p.106). If more products and packaging were created using the circular model it would allow products to be recycled effectively, reduce overflowing landfills, benefit the cyclical system.

Circular design within the textile industry is being explored. The Zero Waste Textiles Factory in India was completed by Exploration Architecture in 2014. They have followed a circular economy structure, the team used biomimicry as a “design discipline.” (Macarthur, 2016, p.71) Thriving on the idea of design and technology combining they looked towards nature and effective cyclical systems that are already in place. The team were passionate about changing the “paradigm for factories in India.” (Pawlyn, 2016, p.70)

The architecture of their factory and the design structure is designed with biomimicry in mind. Designers have learned from nature to become more resourceful and create a more sustainable manufacturing system. The aim of their new factory was to get as close to zero waste as possible and channel all waste from the project into closed loops. Where waste is then used to restart and regenerate a new cycle within the system. Remaining waste is then outputted to other products that have commercial value such as insulation. According to Kate Goldsworthy (2012) by investing “more in technology manufactures can become more cost efficient and become more low

impact on the environment.” Business are able to generate more income when remaining waste is of value to the industry by utilising it to generate new products or filter back into the cycle.

Designing with biomimicry finalised design decisions being made such as the north-south orientation of the factory to allow maximum natural light which is a key architectural design element of the factory. Refer to figure 2 to see architectural roof design. “The design of the primary structure was further learned from natural structures like glass sponges” which show remarkable efficiency by using photovoltaic panels on the roof which generate electricity. (Pawlyn, 2016, p.72) This is a demonstration of how using natural sources such as light that are renewable benefits the environment and the economy rather than traditional linear methods such as coal fired boilers. When the electricity from the roofing system is combined with biomass cogeneration system which creates heat and electricity it creates enough power to sustain the manufacturing cycle. The manufacturers felt it important to invest in significant energy saving measures such as machinery to take the scheme to zero carbon.



Figure 2- Biomimetic textile factory

When looking at biomimicry and how using this method can have a positive effect on industry and design, the designers split the factory into having three main realms: the machines and processes within the factory, water strategy and energy strategy. This helped to create a circular economy system by closing loops and finding outputs and inputs for waste. The water strategy was key in the alternative model as pressures to release less pesticides in water whilst textile manufacturing is high. By capturing rainwater, it allows the factory to have more diversity and reduces water usage saving energy. Through establishing this built infrastructure and designing out waste from the beginning the factory will be able to adapt effectively to change and be more resilient. Initiatives such as these are proven to work more businesses need to reconsider changing from a linear to circular approach. Until then we will not see the level of development which is required to provide sustainably for the future.

This is an exciting time for fibres and the textile industry as progression in manufacturing and creating new materials is being explored. Due to pressures about sustainability and the consequent link with the industry. An increase in interest in harvesting new fibres that are more sustainable but still durable exists. A fibre “is a thread or filament from which vegetable tissue, mineral substance or textile is formed.” (OED, 2012, p.156) Meaning a fibre comes from a natural resource such as a plant. In recent years banana fibre has been further explored in Rwanda and now fabric can be made from this fruit sustainably. The fruit trees are relied upon in the local community as a staple food as well as consuming the fruit, cloth can be woven from the tree fibres. The New Times reported that it is the “most innovative, income generating and community empowering projects of our time.” (The New Times, 2009) This project not only generates money but adds value to the community which can then be invested in training others to learn how to create the textile product.

Other natural fibres such as hemp are now broadly used in washing and cleaning products due to a trend in its sustainable growing methods and its properties. Hemp grows rapidly in warm and cool climates and benefits the overall structure of surrounding soil. It creates a large yield as between “20-30% of the plant can be harvested for fibre” (Fletcher, 2008, p.25). It is superior to other natural fibres such

as cotton. If it was more broadly used in the textile industry it would have less impact on the environment and reduce energy consumption. The product has multi uses such as clothing, paper, bioplastics, insulation and biofuel which means less of the fibre would be wasted off. There are many alternatives designers can employ to create more sustainable clothing, hemp and banana fibres could be viable options. We need to see more products made out of these resources rather than synthetic fibres as they are less harmful to the environment.

There are now innovations by designers to create new fabrics from recycled synthetic materials. They are transforming the textile industry by utilising “thermoplastic waste and creating interim textile products.” (Quinn, 2010, p.120) Eco Circle is a process which “repolymerizes 100% polyester fabrics into virgin quality polyester.” This is a successful way to utilise waste and regenerate quality fibres, but it is suggested as a temporary solution possibly because not all manufacturers have successful waste strategy in place. These innovations between fibres and technology harmonising are creating sustainable futures for cloth as longevity is added to the product. It is important now more than ever to reflect on the amount textile manufactures are doing to reduce waste and create long term solutions.

Currently new materials are being designed and composed in order to tackle the depletion of raw materials. They are also examples of how waste is being used to regenerate new products that can be designed into the cycle and improves cost efficiency. ECOANTEX is 100% recycled polyester made from plastic bottles this is the most available recycled synthetic fibre. Not only does this make a durable material but also solves a huge waste epidemic that surrounds plastic. The applications that this fibre has are broad and range from home furnishings and flooring to automotive upholstery. The fibres are durable and long lasting which potentially could reduce the use of leather. Similarly, ECONYL is created from materials such as fishing nets, carpets, tulle. Making use of waste and creating a new product with durability and longevity. (Watkins, 2019, p.8) Refer to Figure 3 to see how Rolls Royce have successfully implemented Econyl modular flooring designed by Interface at their data office in Derby.



Figure 3- Modular flooring

Another alternative to reduce waste is to extract fibres from existing garments using carding machines which breaks down the material into quality fibres short and long. Unfortunately, not all fibres are suitable some are too short and can only produce a

low-quality yarn when woven meaning the fabric is not durable. Fletcher says that technology and “innovation to extract longer fibres could change.” (Fletcher, K 2008, p.35) By extracting longer fibres and investing in machinery more high-quality yarns could be produced from recycled material such Econyl, which is already available to buy. The new material has added a stylish alternative and created urban industrial mood which was key to the brief. Textures and patterns have been created within the flooring system due to the modular nature of the tiles. “To meet the company needs, the team blended carpet tile designs coming from three different collections.” Econyl (2019) The collections were all inspired from the environment and mimicked nature. However, the design team explained “the biggest challenge was convincing everyone that floor coverings don’t have to be a block of colour or follow a structure.” Econyl (2019) However the client was happy within the overall result. Interface successfully implemented a contemporary office furnishing alternative that subverts traditional carpet.

Not only are designers using waste to regenerate new materials Suzanne Lee has developed a material using bacteria. This process incorporates biomimicry by using nature’s methods of growing. BioCouture is a term and product created by Suzanne Lee who collaborated with expert scientist David Hepworth. An example of how designers have effectively collaborated with science and technology successfully, to create a material which avoids the depletion of resources and innovatively makes “...sustainable clothing from bacterial cellulose...” (Martin, 2010, p.34) The product is created from a yeast and bacteria fermentation process in a large bath it creates a vegetable like leather Lee believes “Microbes could be factories of the future.” Dezeen (2014) Innovatively Lee used digital technology and programming software’s such as laser cutting to pattern the garment and add detail. Lee also included surface decoration which adds appeal to the garment. The product has skin like qualities and is everchanging due to its nature making it more personal as it grows around you. Refer to Figure 4 BioCouture bomber jacket.

The process could revolutionise the production of textiles. Harmless bacteria are modelled and ‘woven’ into something which is similar to textile it creates a seamless

garment from liquid, admittedly a bespoke product. Once the living material is “immersed in a solution of nutrients” (Quinn, 2010, p.117) it begins to regrow due to its bacterial nature which enables it to be re-moulded and easily repaired. When the garment is ready to be discarded it can be composted like any organic item. The product has very little impact on the planet as it can be disposed of easily and could offer a solution to the textile waste epidemic.



Figure 4- Bio Bomber Jacket

By promoting new materials, we could see change in the way consumers consider more ethical clothing. BioCouture is discussed in an interview between Jessica Hemmings and Suzanne Lee. Lee explains that it is important to “...break down prejudice, fashion can change opinions...” (Lee, 2006) On large scale currently BioCouture has not replaced factories and manufacturing solutions need to be put in place to decrease waste and offer other alternatives. New materials need to be surrounded by strong advertising and branding to reduce prejudice and encourage the consumer to purchase revolutionised products. Lee explains this can be achieved by “commercialising BioCouture.” (Wired, 2014) Commercialising BioCouture would make the bespoke product more desirable as it will appeal to a

wider audience. These products would benefit the circular economy and mean manufacturers will have to put systems in place to produce new fibres.

Chapter 2 - Brand stewardship and the role of the consumer

The rapid production cycle of textiles has changed the relationship with buying clothing. We now overindulge and binge on fast fashion as it is readily available. Constantly adding to our wardrobes and chasing the latest trend. There has become a sense of “devalued material culture” due to the rate of mass production. (Hemmings, J, p.379) Surrounded by unsustainable garments gives the consumer limited choice until we see more sustainable options on the high street this fast fashion bingeing will continue.

In a text that discusses material culture by Hugh Mackay he highlights how citizens have become passive victims of advertisers in cultural consumerism. The role of the consumer needs to adjust in order to limit the amount consumed by actively considering more ethical products and reducing disposability. Consumerism is often associated with negative connotations “using up, destruction; waste; amount consumed; wasting disease.” (Mackay, 1977, p.2) However, theories of consumption explain that we seek happiness and pleasure from purchasing goods as it can be a creative process for selecting and building on individuality. But this cannot rival the value of craftsmanship and skill in hand-made items. “Theories of consumption seem to portray a similar mindless superficiality and the green movement confirms the notion of profligacy and waste.” (Mackay, 1977, p.44) Confirming that consumption can become dangerous when overindulging relating specifically to fast fashion.

In order to reduce waste, companies and manufacturers must become more responsible for their products. Brand stewardship could help close the loop within the system if placed at the heart of the company ethos. Brand stewardship relates to the role of retailers it means the company is responsible for products once they’ve sold. This ethos means that companies have to put recycling and repairing schemes in place. The aim is to add value to waste by regenerating it into the system and creating new products as shown in figure 1. However, this requires the moral

obligation of the consumer to become more active in taking responsibility to return goods to companies rather than disposing of them, so they can be regenerated back into the cycle.

Currently H&M have a system in place where anyone is able to take textile products to their store and they will dispose of the products without them going to landfill. This message is advertised within their high street stores, so customers are aware of the scheme. It is becoming more evident that large companies such as H&M are advertising sustainable thinking due to pressures from consumers and environmentalists. They have to be seen leading change both in their attitudes and processes towards textile manufacturing to improve the system. The brand has created a circular structure to aim towards, which mimics the suggestions that the circular economy model offers in figure 1. H&M explain their sustainability strategy as a vision for the future refer to figure 5. They believe “changemakers ensure sustainability is integrated in everything we do.” (H&M, 2019) By ‘engaging changemakers’ it suggests that they are shifting some of the responsibility to consumers, by having an active role and accountability for waste to make positive change.

Our sustainability strategy



Figure 5- Sustainability strategy

An alternative approach to brand stewardship would be Oxfam charity, in 2019 they came up with a solution to encourage the public to take a pledge to say no to new clothes for 30 days. With the hope to reduce the pace and amount new clothing sold whilst, decreasing the amount sent to landfill. This is echoed by Oxfam's message on social media. The trend for sustainability is becoming much more apparent in advertising. "...Every week 11million items of clothing end up in landfill" (Oxfam 2019) using statements in marketing such as these creates a shock factor to encourage change making and raises awareness in the role of the consumer. They created a campaign called "Second-hand September" (Oxfam 2019) to encourage others to recycle by buying second-hand clothes and provide a long-term strategy to reduce waste, refer to figure 6. Consumers have limited choice when finished with textile goods such as clothing, not all brands offer a return scheme. Oxfam are brand stewards as they are selling clothes for a charitable cause that would otherwise be waste.



Figure 6- Secondhand September campaign

The pledge could have the potential to change bad self-indulgent shopping habits by suggesting a change in the behaviour of the consumer to consider being more responsible by buying second-hand. Throwaway fashion is putting increasing pressure on our planet and continuing at the rate in which we are is only more detrimental. Oxfam are offering to email shopping tricks and styling tips to feed purchasers inspiration and make second-hand clothing desirable. In figure 7 second-hand clothing is being modelled by blogger Hannah Ellimen using the hashtag on Instagram #FoundInOxfam to reinforce the charity purchase. This dynamic style of blogging is used to capture fashion follower's attention. By offering consumers styling tips through her digital platform she shows how great and on trend second hand can look. She also suggests "trying a little DIY" Elliman (2019) this allows the garment to be more authentic and personal. In figure 7 she demonstrates how she has upcycled a denim and check shirt in order to regenerate a new product and cut a denim dress, so it has a raw hem to fit fashion trends.



Figure 7- Hannah Elliman, Found in Oxfam

The relationship between fashion and consumption “conflicts with sustainability goals” (Earley, 2012, p.117) We should be prepared for bigger sustainability messages from brands as they have to become more responsible for the products overall life once it has been sold. Advertising and marketing play a huge role in the way trends fall especially with the growth of social media. Often “Marketing techniques are used to encourage consumerism” (Walker, S, 2006, p.72) by promoting products as a way to find “success and happiness” which is fed through the fashion system. (Walker, S, 2006, p.73) Fashion arguably represents the opposite of longevity and durability as a whole it is transient as a trend. But with a shift in marketing and advertising by brands employing bloggers to promote sustainable thinking allows a wider fashion-conscious audience to be targeted and hopefully this will help to evolve consumer behaviour.

Trends are how fashion cycles work and how influences occur, designers look to trends in order to develop new innovative ways to design fashion products.

Trend “a general development or change in a situation or in the way that people are behaving.” (Cambridge dictionary, 2019) With sustainability comes responsibility and the fashion industry’s environmental credentials are under pressure. At the last yarn and fabric fairs such as Premiere Vision “design trends were not the main focus.” (Watkins, 2019, p.7) Sustainability however gained more interest. Potential clients were questioning how much companies were doing to be more innovative and support the sustainability movement.

The pressure of consumers openly questioning brands and designers highlights the importance of brand stewardship and possibly cause a decrease on potential sales if brands are not seen to be working towards a circular future. As people are feeling more responsible for the planet and their individual footprint. “Sustainability is the new macro trend for Winter 2020-2021 Filpucci collection.” (Filpucci, 2019, p.34) Fashion houses and brands making bold changes in trends such as these will encourage others to follow as the consumer will become more expectant of brand stewardship.

In order to change consuming habits, we need to incorporate a more dynamic approach to purchasing which is more responsible. This could be achieved by repairing existing garments to fit to current trends, by mending and adding value to old items it makes the product more personal and meaningful rather than throwaway. It creates a slower fashion approach and instils control by reverting back to hand made production. It is an opportunity for change making, as the wearer can create an authentic style Mackay suggests “we become what we consume.” (Mackay, 1977, p.2)

With realisation about sustainability a new alternative fashion system is required it must follow a circular economy structure that will slow down the fast fashion epidemic. Fletcher says the system must become “holistic, responsible, independent, dynamic and creative it must be based on an ethos of care and concern for the future with continuous trending.” (Fletcher, 2015, p.18) Only then we will see real change and hopefully this will have a positive impact on the rate of climate change and reduce waste. In order to see real change in the future businesses and designers must collaborate with technology and have the circular economy ethos at the heart of their manufacturing system. By making small changes and investing in a new outlook on manufacturing textiles, will undoubtedly benefit the environment. However, “businesses can be nervous about transforming their processes if there is doubt about demand or perceived value.” (Pawlyn, 2016, p.83) But with pressure from consumers and sustainability being one of the most talked about factors of the 21st century they will be left with no choice but to change.

As a whole fashion design needs to be reassessed once over products and clothing were made to last. People owned less but made more themselves and had quality over quantity. Skills and trade consequently were a huge part of society and people had individual trades which were valued. “The idea of disposable products was unknown contrasting to the 21st Century.” (Walker, S, 2006, p.53) Now very few products are sourced locally or ‘Made in Britain’ a large portion of products and nearly all high street clothing is imported adding to the detrimental footprint we have

on the planet. We now have a lack of understanding about the life cycle of products, how they were made and where they came from originally.

In recent years sustainable thinking has added pressure on consumers and designers. "Repair has also been given added momentum by a revival of interest in skills and craft." (Fletcher, 2008, p.107) With increasing sustainability messages and the need to slow the system down, repair cafes have begun to arise in cities and town centres. The aim is to not only repair goods and learn new skills but an opportunity to bring communities together and reinforce skill sharing whilst having fun. "Environmental concern will be positively related to repair propensity." (Scott, 2015, p.31) Due to increasing landfill waste, a products useable life is expected to be longer and through repair we can add meaning and value to products.

Toast is a UK based brand that has developed an innovative repair scheme. Toast (2019) aspires to create "slower more thoughtful way of life" they encourage authenticity in style as they provide a repair scheme which allows the consumer to reimagine textiles and clothing. By incorporating a traditional Japanese practice of reworking goods by piecing elements together, patching and stitching to give clothing new life, this allows worn sentimental garments to be repaired and gives items longevity. Subverting fast fashion purchasing. Toast encourages traditional hand sewing techniques such as the Sashiko stitch, refer to figure 9. This brand embodies a more holistic approach to consuming clothing at the heart of the brand is the ethos of commitment to "supporting and sustaining traditional textile practices and craftsmanship." (2019) They often collaborate with artisans such as Molly Martin who teaches repair through the company. This promotes the benefits of skill and the continuation of age-old techniques that have bared the test of time. On their website they have provided visual aids to learn how to create the Sashiko stitch, refer to figure 8 this shows the final result.

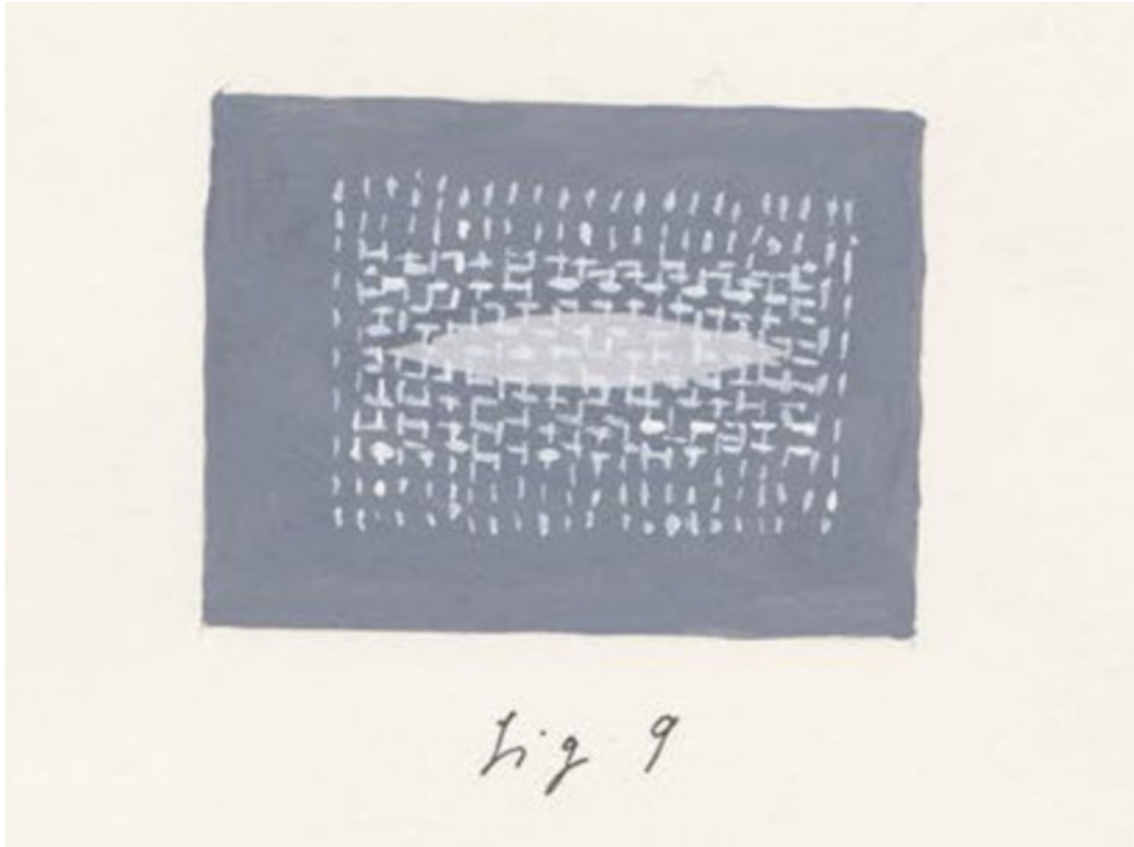


Figure 8- Step by step guide



Figure 9- Sashiko repair

Skill sharing plays such a big role in repairing, Stitched up is a repair café based in Manchester. The café allows an opportunity to repair clothing and other goods and creates new value from what could have been waste. It enables creativity and a more “sustainable and individual approach to clothing.” (Stitched Up 2019) Whilst generating money from the sales of repaired items benefiting the economy. Molly Martin a mender who repairs at Toast explains that “by using our hands to create something ourselves we have a better chance of finding a connection.” (The Vendeur 2019) By giving people the opportunity to learn skills it encourages recycling but also adds authenticity to clothing and connects us with the product. By using the hand to add embellished details and stitches from the wearer it creates a connection between the garment and the consumer.

Sennett also discusses the value the hand has in his book *The Craftsman* “the hand is the window to the mind, hands make the most varied movements that can be controlled at will.” (Sennett, 2008, p.149) Being able to control the hand at will means the wearer can add more authenticity to the garment and feel a sense of achievement from repairing. The heart of a repair café is the people who attend and are willing to make a difference to learn something new. To see change in the future traditional skills such as sewing and repairing garments need to be taught to new generations. Repair cafés are passionate about making a difference and they feel responsible to teach skills in order to create a greener future.

The art of repairing is now available on prime-time television as the BBC have created a programme called “The Repair Shop” aired on BBC 1. The show harmonises the idea of craft and skill and the importance of both in the 21st century. Without skilled individuals’ objects from the past and present would never be repaired or restored, and we would lose pieces of history. This highlights the importance of repair and recycling but also further links to the notion that craftsmanship is having a revival that is suitable to this generation. It allows the consumer at home to have more understanding on the value of items and shows that disposing goods is unnecessary when they can be repaired. “The whole production radiates care and skill, people bringing their careworn family treasures to be fixed.”

(Radio Times, 2019) It allows families to understand how repairing can revitalise old treasures rather than replacing them. Which benefits future generations and history is not lost. Another story is attached to these items through them being repaired authentically. It demonstrates an old attitude of make do and mend and the value of the hand before a world of digital technology. Although the show does not solely focus on textiles it shines light on skill sharing and learning and may encourage people to learn how to repair goods or go to a repair café. Which further enforces the trend of sustainability and hopefully leads to a circular future. The show now has “2 million fans tuning in every afternoon” (Daily Mail, 2019). With so much interest in the show it suggests an alter in behaviour and feelings towards repair reusing and recycling.

Conclusion

The manufacturing of textiles must become more dynamic and responsible for waste with care and concern for future generations. In order to see positive change within the textile industry designers and manufacturers must collaborate in redesigning systems that are more sustainable for the future. Sennett states that “sustainable suggests living more at one with nature, establishing equilibrium between ourselves and the resources of the earth.” (Sennett, 2008, p.12) This is suggestive of the circular economy model created by The Ellen Macarthur Foundation. The system would be more holistic if it was circular and waste issues could be tackled effectively through regeneration. In order to find harmony between manufacturing and finite resources the industry needs to begin utilizing biomimicry as a design discipline as has been exemplified in the Zero Waste Textiles factory earlier discussed.

It is now more important than ever for consumers to be less passive and actively become more dynamic for the future. This can be achieved through engaging with changemaking and taking a more individual approach to clothing by avoiding fast fashion purchases. Stuart Walker discusses the sustainable myth “if the message goes unheeded and we fail to alter our behaviours we will be the cause of our own destruction” (Walker, 2006, p.17) This addresses the role of the brand and consumer as individuals we can help close loops within the system and become more resource efficient by purchasing second hand and reusing and repairing. Ultimately taking a slower approach to clothing to allow us to reconnect. This can be achieved through engaging with changemaking and taking a more individual approach to clothing. As suggested by Hannah Elliman who campaigned successfully for Oxfam and used second hand purchases to reinvent her wardrobe create an authentic style.

Contemporary designers such as Suzanne Lee have developed research labs in order to create new materials that are less harmful to the environment. They have the potential to tackle waste issues. In an interview between Suzanne Lee and Alessia Anderotti the viability of BioCouture is discussed. Lee explains that the

challenge is to make it happen and that it would not be achievable on her own. She states that “to ultimately go beyond a low-tech artisan process to one that can be scaled up industrially and produced in volume.” Andreotti (2016) Only then real changes are being made at scale and there is a true alternative to fast fashion products. She explains that the challenges are “building a biotech infrastructure that can profitably compete with existing commodity fibres.” Andreotti (2016) However, if investment was made in revolutionizing manufacturing and working to a circular future this would be a viable option that would be readily available and produced in mass, as a circular economy already supports this process. When design and technology combine exciting things that future the idea of cloth can happen such as Lees experiment.

In the long term we need to be all-embracing of sustainability messages and consider taking a more independent and valued relationship between ourselves and what we consume. This needs to be continuous in the way it trends in order to slow down the system and benefit the environment.

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