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0. EDITORIAL #20

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The Human Touch

An Ethical Discussion on Sewing Technology in the Age of Digital Transformation

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Keywords
Sewing Technology, Convivial Technology, Garment Industry, Human Labour, Ethics of Production.

Abstract
While society is being transformed by information technology, contemporary sewing technology will continue to depend on sewing by human hands. Based on this, the production of clothing – and in particular the sewing process – must be assessed from an ethical perspective. The Matrix of Convivial Technology, which finds its origins in the Degrowth movement, is used as a guide to discuss the ethical features associated with sewing technology. Examining this technology across the spectrum of convivial values results in distinguishing it as a *social technology*. As such, it holds potential to fulfil basic needs, empower people through the ability to create, and build relationships. Under a commercialised motivation however, the human component shifts its position: Human labour becomes "inferior to the system" (Vetter, 2018, p. 3) and its inherent consumerism. Supported by the theoretical framework of the *Social Construction of Technology*, it becomes clear that the core question of how to design a more just future fashion industry is not – as initially thought – one of techno-optimism versus techno-pessimism: rather it is a question of social agency versus social passivity.

1. Introduction

Technological innovation and digitalisation play an important role in the globalised 21st century – accepted as part of everyday life or seen as a means for societal progress. "Some see our epoch as the golden age of technology […]" (Acemoglu & Robinson, 2019, p. 495). To avoid detrimental trajectories of this societal transformation and instead actively design desirable futures, it is important to examine the human-technology-relationship and the path it is taking.

The fashion and clothing industry forms an example *par excellence* of a complex and entangled system of stakeholders, processes, locations, dependencies, and conflicting interests – across social, environmental, technical, and economic spheres. One-third of the jobs worldwide are said to be linked to the textile sector in some way. Sixty million people work in the textile and clothing industry (Federal Ministry for Economic Cooperation and Development, 2020), of which thirty million people are directly employed in garment manufacturing (Global Fashion Agenda & The Boston Consulting Group, 2017, p. 15; House of Commons, 2019, p. 12). The industry faces undisputable issues, mainly around waste creation, environmentally harmful production practices, and exploitative labour conditions. Simultaneously, it is seen as an economic driver and accelerator, as a stepping-stone-industry for developing countries (German Development Institute, 2020, p. 8) and, not the least, as a source for the pleasures of consumerism and the possibilities of individual and cultural expression.

The size of the workforce further shows that "[…] the fashion industry has an opportunity to create large-scale social

change for millions" (Global Fashion Agenda & The Boston Consulting Group, 2017, p. 15). Hence, this paper aims to discuss sewing technology as a *social* technology. The focus is set on manufacturing as this area of the industry is showing the strongest juxtaposition of human labour and efforts towards digitalisation and full automation.
This article will begin by establishing the ongoing fundamental importance of the human component within garment manufacturing, before introducing the Matrix of Convivial Technology (MCT) (Vetter, 2018). The MCT will be used as a discussion guide for an examination of the human-technology-relationship of sewing technology in both large- and small-scale applications. The paper will conclude with a call for social agency in the design of future fashion technology and overall fashion industry.

2. Clothing Manufacturing: The Machine and the Human

In essence, the functionality of sewing by machine has not changed since its introduction in 1790 (Nayak & Padhye, 2018, p. 7)[1]. Many specialised sewing machines have emerged from the basic lockstitch, offering seams with specific properties. However, the stitch formation always relies on the element's thread system, thread tension regulation, thread interlocking elements (needle and hook), and fabric transport. Beyond this, the most crucial component of sewing technology is physical human agency (Fig. 1, 2).

1 Bonding/welding as well as knitting technology have intentionally been excluded from examination, as the underlying differences in technology and application would exceed the scope of this paper.

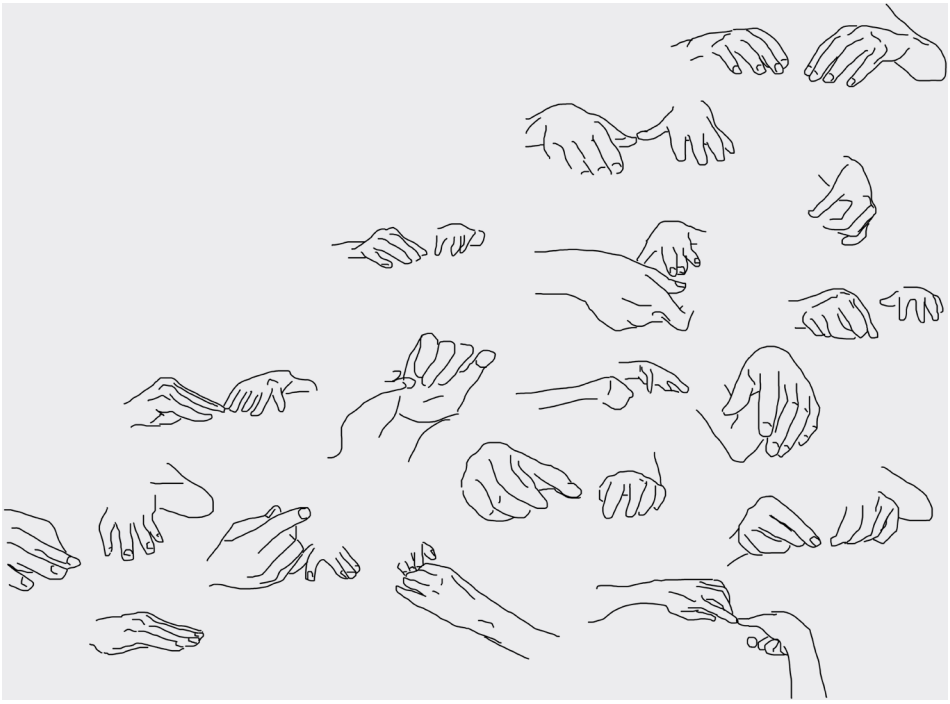

Figure 1. Juliet Seger. Illustration: Study of hands whilst sewing. Author's own, 2020.

Sewing technology draws on the complex capacities of the human brain and foremost the uniquely human dexterity. The whole process uses the human ability to handle floppy materials and manipulate them into different shapes as well as the skill to immediately adapt the pressure and position of hands to a variety of surfaces and react immediately to the way they form during the stitch formation. Individual sewing tasks may be automated or supported by ancillary functionalities, but the steps in between are directed and executed by humans.

Functional and financial obstacles prevent the digital transformation of clothing manufacturing, at least in a mid-term

Figure 2. Juliet Seger. Research through creative practice. Author's own, 2020.

perspective. In its recent discussion paper on "Automation versus Relocation in the Global Clothing Industry", the German Development Institute (German Development Institute, 2020) examines emerging technologies, but gauges that the maturity of technologies of full automation in sewing manufacturing is low. Though "the textile industry was the first to become mechanised, the clothing industry may be among the last to get fully digitally automated" (German Development Institute, 2020, p. 12). This statement can be interpreted as counter-intuitive to the narrative and supposed digital trajectory of the modern and future world. An examination of the options, scale and obstacles of a digital transformation in clothing manufacturing concludes in the ongoing and long-term importance of human labour in the fashion industry. The reliance on a human workforce and the potential impact future automation will have on it, necessitate a re-evaluation of sewing technology as a primarily social technology.

3. Manual Clothing Manufacturing under the Lens of MCT

As a discussion guide, this project consulted the Matrix of Convivial Technology (Vetter, 2018), which can be placed in the context of the Degrowth movement. The latter questions the dominant capitalist system with its inherent demand for and dependency on economic growth. It criticises the status quo as socially and environmentally exploitative while advocating a paradigm shift of societal values requiring "[…] radical redistribution, reduction in the material size of the global economy, and a shift in common values towards care, solidarity and autonomy" (Konzeptwerk Neue Oekonomie, n.d.). Andrea Vetter (2018) translates the values explored by

Ivan Illich in his work on *Tools for Conviviality* (1973) into the contemporary period: "[…] the need for decentralization and a certain autonomy of hierarchical infrastructures, scalability, and the necessity to look for technologies that are not harmful to the environment" (Vetter, 2018, p. 3).

MCT is a tool to examine technologies across the five dimensions: "relatedness, adaptability, accessibility, bio-interaction and appropriateness" (Vetter, 2018, p. 1) which are individually cross-referenced with the four levels of material, production, use, and infrastructure. "The dimensions of the MCT refer not to efficiency or economic performance but to conviviality, therefore it can change views about which technologies are desirable and which are not" (Vetter, 2018, p. 8). The application of MCT in the context of this paper differs from Vetter's intention, as the matrix was not filled in within a workshop context with relevant participants but by the researcher herself. The input was gathered through multiple sources: 1) secondary literature; 2) qualitative interviews with industry professionals from design and tailoring[2], as well as from the field of digital fashion business solutions[3]; 3) the creative practice of paint-sewing, wherein hands covered in paint visualise the human agency in clothing manufacturing (see Figs. 2, 5); and 4) the author's own industry experience as a tailor, clothing engineer and designer. The MCT helps to collect and structure "[…] data about underlying ethical assumptions and aspirations" (Vetter, 2018, p. 1).

2 The interviewees are former colleagues of the author and were chosen on the basis of their diverse and relevant work experience in manufacturing, design and fashion management.

3 The interviewee was contacted to share expertise on the impact and development of digitalisation and automation on the fashion business landscape.

As Vetter (2018, p. 8) mentions in her work, a difficulty in completing the MCT lies in the differentiation of assessing the current state of a given technology versus an ideal vision of such, including its potential for adaptation within a changing system. However, this only supports the necessity of an ethical discussion because it highlights the existence of space for positive change.

Immediately upon commencing the completion of the MCT, it becomes obvious that an assessment of sewing technology depends on the context in which it is applied. Because the core of sewing technology has been used in its more or less original form over centuries, it itself is the same in a household sewing machine in Germany, as in an industrial sewing machine in Vietnam. However, the system in which it is embedded heavily influences whether the technology can be assigned a convivial potential or not. For this reason, the MCT assessment of sewing technology has been conducted separately a) for a small-scale application, detached from considerations of earning a living; and b) for a larger scale application, where the output is commercialised and fed by a production system. In Figure 3, the results of each – a) and b) – are connected with a line; these lines are then layered on top of each other to visualise where sewing technology of a small-scale and large-scale application overlap or contrast when evaluated against their potential for conviviality.

3.1. Materials Level

Small- and large-scale perspectives on conviviality of sewing technology overlap the strongest along the *Materials* level, re-

garding fabrics and trims. In both categories, the procurement of raw and finished materials – from polymer or fibre production, thread production and weaving/knitting – is dependent on specialised processes, forming an entire industry of its own (textiles production). Hence, both small- and large-scale sewing technology are detached from the actual raw material harvesting and processing and the actors are usually merely linked to the traders in wholesale or retail[4]. Across all dimensions (relatedness, access, adaptability, bio-interaction and appropriateness), the *Materials* level of sewing technology leans further towards non-conviviality (Fig. 3) with the strongest tendency in the area of bio-interaction. This points towards one of the most crucial issues of the clothing industry: the ecologically unsustainable impact on natural resources.

An exception to the non-convivial character of sewing technology along the materials level can be found in the upcycling of textile material. Herein lies a necessity for active creative input into the material procurement, which, on a small-scale level, can foster a strong degree of conviviality as it necessitates engagement with a variety of sources and methods for sourcing: people, places, experiences. However, for large-scale production in the current system, this approach still lacks commercial feasibility and viability.

4 Note: The raw material for textile production is often dependent on its geographical provenance (e.g. habitat of silkworms for silk; flax plants for linen). Beyond this, textile production would be technically independent from special local conditions and possible anywhere where skills, processing machinery, and chemicals can be acquired. Spinning, weaving and machine knitting show a rather high threshold for autonomous and convivial use. Nevertheless, a localised production might be interesting to consider in the Degrowth context.

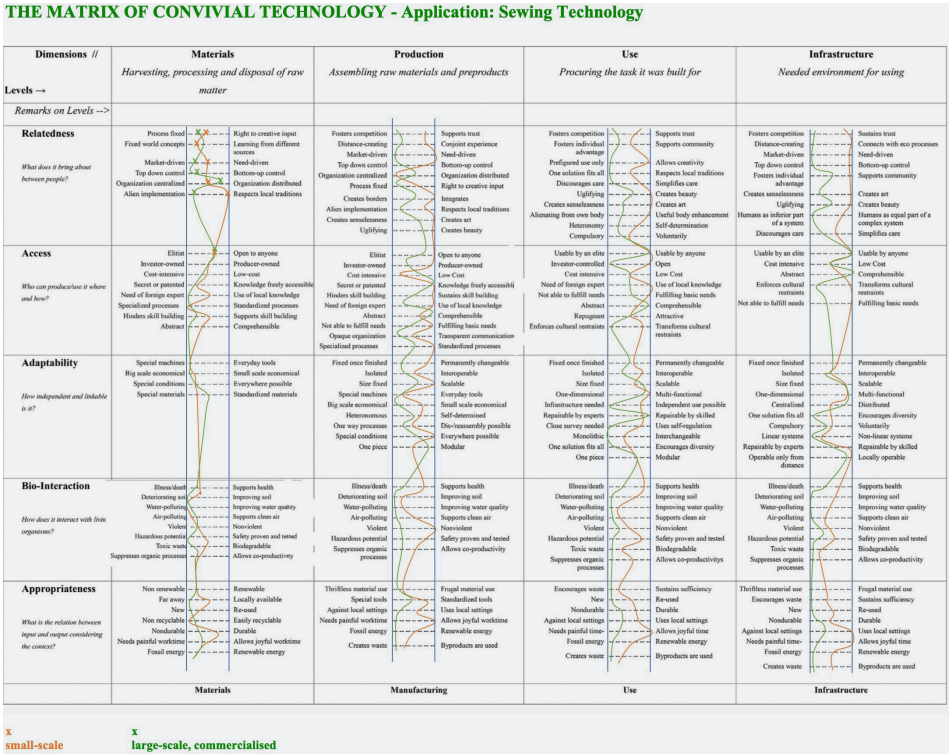

Figure 3. Juliet Seger. Matrix of Convivial Technology – Discussing sewing technology in small- and large-scale application. Author's own 2020, based on Vetter (2018, p.3).

3.2. Manufacturing Level

On the *Production* level – that is, in the direct application of sewing technology in its fundamental form of human-led machine sewing – the dimension of relatedness strongly highlights the context-sensitivity of the MCT assessment. The values assigned to a commercial and non-commercial context appear to be at a tangent to one another (Fig. 3).

Non-commercial sewing has the ability to create not only products but also community. The majority of interviewees

who had a technical connection to fashion described a convivial experience when asked about their introduction into sewing technology. These initial experiences were based on the passing on of knowledge between expert and laymen, for example between grandmother and grandchild or mother and daughter. An increase of skill then led to the exchange of expertise with likeminded people (e.g. in a school and university context or sewing workshop). In this, the "right to creative input" (Vetter, 2018, p.3) can transpose social hierarchies as the variety of technical solutions offers a variety of approaches to product development. The student might apply a different but equally valuable approach as the teacher. Discussing these different approaches is a common procedure in the sewing community and "integrates" (Vetter, 2018, p.3) the various different voices. Even more literally, sewing technology as a domestic technology has historically created a space for women to come together and communicate with one another as a community outside the social restrictions of their immediate family ("respects traditions" (Vetter, 2018, p.3) from an industrialised nation's point of view). Further, sewing technology is one fruitful way to bring together people of different languages, as the universal knowledge and physical nature transposes language barriers. The shared expertise has the potential to bridge a cultural gap without establishing a hierarchy of "known" versus "unknown" (Vetter, 2018, p.3) language. Finally, sewing technology on a non-commercial scale *is* "need-" rather than "market-driven" (Vetter, 2018, p.3). The definition of "need" (Vetter, 2018, p.3) can certainly be subjective and in line with this, the sewing operator creates what she regards necessary or desirable, hence demonstrating the

nature of "bottom-up control" (Vetter, 2018, p.3) of non-commercial sewing technology. The combination of community experience, individual agency, and need-driven execution foster the creation of useful or beautiful objects, resulting in potential for creating convivial value between people.

Within a *commercial large-scale system*, the values associated with sewing technology are interpreted quite contrary to the small-scale perspective. Here, the technology is subject to a high level of competition created through the fluctuation and fast pace of fashion trends. The resulting fragility of businesses creates the exact opposite of trust. Driven by the market, sewing technology is often subject to top-down decision-making by financial leaders within the company or external investors. The global dispersion of the individual processes of the value chain detaches the decision-making entity from the executing entity. This is especially characteristic of fashion brands who subcontract their manufacturing and, through this, interpose multiple middlemen (or -women). The "verticalization" of companies, i.e. performing the entire value chain from development to production (Schroeder, 2020), merges the process responsibility and execution within one company but still adheres to top-down control. Within a growth-oriented economic model, these decisions are informed by economic considerations of profits and margins that subsequently underlie the economics of quantities, supply and suggested demand. Driven by the market, clothing on an industrial scale is often produced in "senseless" (Vetter, 2018, p.3) quantities (Cobbing & Vicaire, 2016) and adheres to specifically organised processes, eliminating any "right to

creative input" by the sewing personnel. Organized through a division of labour in which each sewing operator executes one sewing task of a garment (e.g. only close the shoulder seams and side seams of a shirt or only insert buttonholes) the human input in large-scale production is characterized as "low-skilled" (German Development Institute, 2020, p. 8). In the context of convivial technology this can be seen as an asset, as it opens job opportunities for people of low educational background ("integrates", Vetter, 2018). However, this can also foster precarious and exploitative working conditions if the demand for the said jobs – and thus the pressure to maintain the job – is high.

The severity of existing precarious working conditions manifests itself in the assigned values of the bio-interactive dimension of the MCT. Similar to the materials, use and infrastructure levels, the manufacturing sphere of sewing technology often has a negative impact on the surrounding living organisms. The systemic pressure prioritizes productivity over environmental concerns. Important factors are the recycling of production waste such as the offcuts of synthetic textiles or the recycling of respective fibres that settle as microplastic in air, water and soil. As a very physical occupation, sewing carries many potential health hazards for the sewer when carried out without ergonomic precautions (e.g. appropriate seating, adjustable table height, appropriate lighting, ventilation) and socially appropriate working conditions (e.g. living wage, regular breaks, access to toilet facilities). In line with this, large-scale sewing technology has the potential to "need painful work time" (Vetter, 2018, p.3), unlike a small-scale application, where

the sewing operators are autonomous in the decisions to create the work environment to their desirability and comfort.

3.3. Use Level

At the *production* level, sewing technology is interpreted in its functionality as a productive technology, hence in relation to the *action* of sewing. At the *Use* level, sewing technology is placed in relation to the outcome it creates: Clothing. The two columns (Fig. 3) show similar tendencies towards or against convivial values. The use level of *small-scale sewing technology* is linked closely to the characteristic of "need-driven" creation that serves a purpose and can fulfil "basic needs" (Vetter, 2018, p.3). It offers "multi-functionality" (Vetter, 2018, p.3) in its output as there are no restrictions to the garments that can be created on the basis of human application of sewing technology. A small-scale approach systemically offers a connection between the creator and the consumer (e.g. through direct contact, through an informal brand identity, or if the creator is the consumer). By manufacturing the entire garment, the creator reacts towards a "basic need". This attention remains inherent in each garment and, through this, transposes a sense of trust and community.

In *large-scale application of sewing technology*, the connection to the human creator (sewing operator) is invisible. The division of labour assigns the sewing operator the functionality of a machine. It is "usable by anyone" (Vetter, 2018, p.3), which in a convivial outlook would be desirable. Practically applied in the clothing industry, however, it is ambiguous: while "usable by anyone" allows low-skilled labour – and hence

accessibility to employment and development "stepping-stone industry" (German Development Institute, 2020, p. 8) – it also provides a platform for exploitation as the competition for employment is high and the workers have no leverage (i.e. no special skills) in the fight for better working conditions.

3.4. Infrastructure Level

The *Infrastructure* level of the MCT summarizes the tendency towards or against conviviality, as indicated through the assigned values of each the commercial and non-commercial scale of sewing technology. Zoomed-in, sewing technology offers high potential to be beneficial (convivial) to the individual and to society; it is the infrastructure – the surrounding system – that manifests the convivial or non-convivial character of sewing technology. The values assigned to the infrastructure level follow similar reasoning as the levels previously examined. Beyond this, it presents a value that is considered the most striking across this MCT assessment: "human as equal part of a complex system" versus "human as inferior part of a system"[5] (Vetter, 2018, p.3). While other values leave room for interpretation and subjective nuances, these two claims express the fundamental contradiction of sewing technology: The technology itself is wholly dependent on human agency, but on a commercialised large scale, these humans are nevertheless treated as inferior components of the system. The nature of this inferiority results in massive social issues that accompany contemporary garment manufacturing.

5 It is not clear, whether the word "complex" is purposely added to the side of convivial values and withheld on the opposite, or if this is a layout mistake within this version of the MCT.

Figure 4. Juliet Seger. Hands covered in paint to trace the human touch in garment manufacturing. Author's own, 2020.

Figure 5. Juliet Seger. Research samples: Showing the repetitive patterns of handling during sewing. Author's own, 2020.

Figure 6. Juliet Seger. "The Human Touch" Shirt, visualising the human agency of garment manufacturing. Author's own, 2020.

4. Synthesis from MCT-Assessment: Social Agency in the Design of Future Technologies

The differing classifications of each – the commercial and non-commercial scale of sewing technology – which the MCT assessment has highlighted, show that it is the system in which it is embedded that designates the technology's convivial or non-convivial character. "In convivialist conceptions people are seen as inherently interwoven in social networks and relations and driven by complex motivations […]" (Vetter, 2018, p. 4). Hence, maintaining and expanding the use of convivial aspects of sewing technology while dismantling its non-convivial character is a question of social agency. Internalising this argument is an important feature in the design of future socio-technological systems.

The question of the desirability of a technology is not one of techno-optimism or techno-pessimism: rather it is one of activity versus passivity. A technologically deterministic view sees the invention and implementation of new technologies as the main driving force for societal developments (MacKenzie & Wajcman, 1999, pp. 2-6). This understanding assigns technologies an inherent, almost evolutionarily predetermined force for development; if the emergence of a technology is inevitable, it will succeed to appear. It interprets technology as being of "neutral" character or as incorporating a quality of "truth" and "correctness", including a natural enforcement of the "best" or "best-working" technology. Applied to the human-technology relationship in sewing, this would imply the characteristic of human inferiority in large-scale application to be a necessary consequence of the technology itself.

The results from the two MCT-assessments however, support the opposite theory: The *Social Construction of Technology* (SCOT). Overlapping with the convivialist approach[6], SCOT understands social dynamics and interactions as the main driving force for human development. Therefore, technological developments are socially situated. To understand the emergence or decline of technological artefacts, the technology must be interpreted within the social context it is embedded in – as a symptom of social interactions, rather than as their cause.

In an age in which digital technologies of communication and automation are omnipresent and through the COVID-19 pandemic expand to new spaces, it can seem intuitive to follow – or pessimistically phrased: "surrender to" – a trajectory of digital futures and digital solutions. When technology companies such as Google, Facebook, Amazon, Alibaba and their respective leaders influence the public debate and global decisions as they have done so far in the 21st century, it can seem suitable or inevitable to adhere to respective approaches in the design of the future social landscape. However, the concepts of conviviality and SCOT can give guidance to understanding *human agency* in this design process.

Tackling the clothing industry's social issues is not a question of the technical innovation of sewing technology, that is, not a question of digitally transforming the functionality of how

6 "The concepts of convivial tools and radical technology emphasize the importance of the social that constructs and is constructed by technology" (Vetter, 2018. p. 3).

clothing is manufactured. It is a question of re-configuring what is deemed acceptable by society, of reversing *the* "stabilization of the technological artefact" (Pinch & Bijker, 1984, p. 424) of sewing technology. A "closure of debate" (Pinch & Bijker, 1984, p. 424) has taken place in the rise of the Fast Fashion industry where its socially exploitative practices and mass production have become accepted in contemporary consumer culture.

Throughout this project, the component of human agency has been identified as a link between sewing technology and clothing consumption. However, this link seems to be invisible to the wider public eye, as sales continue to grow, despite potential human rights violations embodied within garments. This is even more apparent in spheres where digitalisation enforces a disconnection between designers and producers and producers and consumers. As Indonesian union representative, Andriko Otang, points out, the way to tackle the ongoing social issues is to actively change the status of the workers (FEMNET, 2020).

5. Concluding Considerations

Applying the MCT assessment to sewing technology can only provide a selectively composed framework to discuss the associated complex system. It does not deliver a concrete solution on how to move forward from the state of crisis. Artist Paula Dunlop points to the often-inherent motivation of Design Thinking to produce "the one" apt or functional result. She claims that this outcome-centric approach is built on the

> […] the premise […] that we can "design" our way out of ethical dilemmas by determining the correct rules or behaviours needed to reach a particular end. As such, it overlooks ethics as something perpetually lived, made and remade through ethos – our located experience of the world" (Felton, Zelenko & Vaughan, 2012, p. 193).

In order to design sustainable, functional solutions to the fashion crisis, the understanding of sewing technology as a *social* technology needs to be internalized within the industry. For this, the human component of clothing production must become visible beyond price calculations. The social impact needs to be treated as a performance indicator and *lived* in the strategic development and assessment of fashion businesses.

6. Further Reading

As explained in the preceding discourse, there is a dissonance between the labour put into clothing manufacturing and the actual awareness and respect brought towards it in the dominant production and consumption system. With the creative technique of paint-sewing, the author creates physical artefacts that make this issue tangible and literally visible. With hands covered in paint during the sewing process, the human touch of sewing technology becomes imprinted on the garment (Fig. 4-6). Thought of symbolic character, this creative output seeks to visualise the intangible and support the public debate towards a more just fashion industry. For more on this visit: www.paidvacation.de/project-the-human-touch/.

Acknowledgments

This paper first appeared as a component of the author's dissertation in *Design for Change* (MA) at The University of Edinburgh under the title *The Human Touch - An Ethical Discussion on the Digital Transformation of Sewing Technology*.

Figure 7. Juliet Seger. "The Human Touch" Shirt on person. Author's own, 2021.

Figure 8. Juliet Seger. "The Human Touch" collection: T-Shirt. Author's own, 2021.

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V

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She is conducting her studies at the intersection of Design and Science, in particular related to the application of biologic processes in substitution of the conventional manufacturing processes, in order to exploit their potentiality in terms of new aesthetics, languages and fruitions patterns. She has conducted several department researches and experimentations in the field of biomaterials, obtained from the re-use of organic waste from the agri-food chain, and collaborated as teaching assistant on the topic. She is actually part of the team of the Interdepartmental Center Saperi&Co of Sapienza University.
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For over 20 years she worked in projects in Ethiopia, Algeria, Tunisia, Morocco, Yemen, Jordan, Haiti, with the most important national and international donors WHC - UNESCO, UNCCD, World Bank, European Commission, WMF, AICS. Since 2011 she has been collaborating with the DIDA UNIFI especially in projects around Maghreb countries and in the social field promoting Social Design projects and workshops using co-design methodologies.
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A scientific training gained in the national and international design environment gives him research and strategic planning skills in Design and Design for Fashion, thanks the relationship with supranational research and training institutions as Iacocca Institute of Lehigh University USA; Oxford Brookes University, England; Saint Petersburg University of Technology and Design, Russia; Goenka University, New Dheli, India; Tecnologico de Monterrey, Campus Sonora Norte, Mexico; BIFT Bejing Univeristy of Fashion Technology, Beijing, China; ESMOD Japan, School of Fashion Design , Tokyo, Politecnico di Milano.
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Main focus of his line of research are parametric design, medical design, and advanced manufacturing – knowledge acquired during his academic path. The Ph.D. course with industrial characterization has allowed him to carry out and consolidate his research activity, as well as at his university, also at the Escuela Técnica Superior de Ingeniería y Diseño Industrial (Universidad Politécnica de Madrid, Spain) and a company from Campania, based in Gricignano di Aversa, to design a system of innovative orthopedic devices through parametric design.
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He is currently engaged in the research project: "Design, Art and Business: innovation, strategy and sustainable channels for the creation of value", which focuses on the analysis and collection of information relating to the mapping of the relationships between Design, Contemporary Art and Companies starting from the Tuscan territory.
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She is the Editor-in-Chief of ModaPalavra e-periódico (UDESC), Coordinator of the laboratory FPLab - Futuro do Presente (UDESC), Collaborating Researcher at the University of Lisbon (CIAUD/Portugal), and Integrated Researcher at the TrendsObserver platform (Portugal).
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Since 2015 she has been teaching fashion and communication design courses at the Accademia delle Belle Arti di Napoli.
Since 2009 she has been working as a professional visual designer and in 2017 she is co-founder of the Pluff design studio specialized in visual communication projects of national and international importance.
Among the main projects are the visual identity of the Italian Pavilion at the Venice Biennale (2015) and the creative direction of Milano Book City.
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For several years she led sewing workshops for children and supported the student sewing lab at HAW Hamburg.
Her label PAID VACATION functions as creative platform for contemporary tailoring and made-to-order fashion design.
Since Autumn 2020 Juliet is based in Berlin where she works as fashion product developer.
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Her research interests concern the heritage/creativity sphere within the digital evolution; thus, the application, impact and opportunities that lie in the relationship between digital technologies and cultural heritage. She is currently working on a research project titled "Living archive. Disseminating and reusing the Fashion cultural heritage" founded by Regione Toscana.
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