



TCBL DESIGN LABS



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INTRODUCTION

At TCBL we have created three different types of labs, which represent the following perspectives:

- **Design labs:** focus on research, experimentation and encouraging creativity
- **Making labs:** focus on the material production of textiles and clothing
- **Place labs:** are designed as a laboratory for persons and human interactions

The three labs together form a network of researchers, designers, consumers, and developers who share knowledge and inspire each other and develop new ambitions. This is the starting point to create change and improve the current situation through the design and implementation of new concepts.

This Guidebook provides the starting framework for the first typology, Design Labs.

1 DEFINITION OF A DESIGN LAB

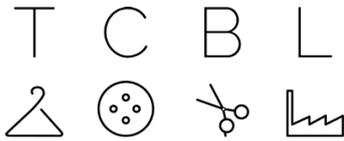
TCBL Design Labs are described in the project description of activity as follows:

The Design Labs explore ways of stimulating creativity in parallel with new ways of co-design, together with the processes of production. Design-for-one, self-design, designs based on cultural heritage, crowd-design, and collaborative design are all approaches that may be explored. In addition, the Design Labs will explore the creative potential of new materials, new technologies, and new production processes.

TCBL Design Labs can be defined as facilities exploring tools and methods for designing textiles and clothes, working with professionals, fashion students, or anyone, even working from home. Their essential purpose is to produce and transfer knowledge and innovation into T&C Business Systems, motivating potential pilots to emerge. In so doing, they experiment with technology platforms, organisational and service innovations and design for sustainability. Design Labs are focused on the ideation and conception of fabrics, garments, designs, etc., by an immaterial value and emotion-oriented point of view, providing specific support to home based design and production.

The table here below gives an overview of some of the many possibilities for activities and features we have explored for the Design Labs, following the descriptive framework of WP3.

Lab feature	Brief description
Main activities	<ul style="list-style-type: none"> • Development of creative ideas and their transformation into a design reality • Offering knowledge of and expertise in the use of technology and environmental concepts for innovation in design • Design office services to textile and fashion companies • Facilitation of production and product management to textile companies and fashion designers • Teaching and researching new possibilities in materials, design processes, prototyping processes, transmission of old craftsmanship techniques, branding, marketing, etc. • Building of design skills for unemployed people to enter the fashion and textile market as workers or small businesses • Creation of specialized libraries in fashion and textile for textile designers and design students • Building up archives, both physical and online, with textiles and materials, open to creative people, designers, artists, students, collecting and recovering company textile archives, and advice and counsel to textile companies to preserve and organize their archives • Experimenting production of zero km textiles • Prototyping facilities through connections with SMEs • Design Challenges to select talents from schools / territories • Online/offline social networking, events, exhibitions, workshops etc.
Facilities	<ul style="list-style-type: none"> • Ateliers; printers; sewing machines; cutting machines • CAD stations with 2D and 3D design and pattern making software, printers and scanners, cutting table • Equipment and on-site expertise with access to expertise elsewhere • Design challenge platforms, exhibition spaces • Extending the facilities of FabLabs and WetLabs with sewing machines, textile printers, knitting machine, mannequins and other tools

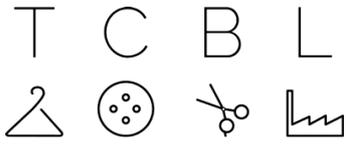


Lab feature	Brief description
Setting	<ul style="list-style-type: none"> • In geographical areas that have been hit hard by textile manufacturing crisis • In geographical areas of high creativeness/skills/knowledge • Textile Museums • Ateliers • Factories • Social enterprises • Fablabs
Service concepts	<ul style="list-style-type: none"> • Offer design, manufacturing and business assistance • Design as a service • Prototype production • Applying design thinking to service design issues • Design challenges/ tech transfer promotion • The Waag Academy, separate lessons/workshops, model and consultancy, outcomes of the participants that will be attending the Academy
Audience	<ul style="list-style-type: none"> • Designers • Researchers (technologies, materials, etc.) • Artists • Students • Small garment businesses • Start-ups • Unemployed • Creative people in general • Local community
Supervision	<ul style="list-style-type: none"> • Shared ownership • Volunteer employees • Governance depending on the level of support: give more, ask more – give nothing, ask nothing
Sustainability & Environment	<ul style="list-style-type: none"> • Eco-design support • Raising awareness / educate / research, working on procedures, processes and techniques more sustainable and eco-friendly starting from the materials and the ways they're developed and used • Transport reduction, local production
Fairness	<ul style="list-style-type: none"> • 'Open' approach, making technology more accessible and empowering people through knowledge transmission. • Research fair materials and fair processes. • Fair criteria to develop and communicate the opportunities to all potential interested actors • Fairness in governance: high ethical and moral values, low operational costs, social enterprise, oriented into support regardless revenue
Openness	<ul style="list-style-type: none"> • Open to all citizens; open-innovation paradigm • In principle everything is based on the open design and open source philosophy • Open to any business • Challenges are open to any design team • Opening up the design profession, processes and techniques

2 ACTIVE DESIGN LABS

During the first year of project implementation, TCBL partners have defined, through the internal evaluation procedure described in the previous chapter, six Design Labs. The following table gives a brief overview of the selected Design Labs, based mainly on the peculiarities and specializations of the partners' territories.

Lab	Brief description
Athens Fashion Design Lab (Athens, Greece)	The lab's main features and services include: Product design (cad facilities, design software etc.), Small scale product prototyping facilities, Sourcing services, Fashion trends, information and analysis, Training services for SMEs and young designers (e.g. branding, export marketing, product cost analysis etc.), Social networking (designers, SMEs, retailers, schools, consumers etc.), Documentation at networking with heritage foundations, and Processing and preparation for clustering and new labs development. The main target Customers are: T&C SMEs, Designers and design schools, Heritage foundations, Research centres, and Prototyping SMEs.
Lottozero (Prato, Italy)	Lottozero is: Design Office: we design textiles on our own, we help companies and textile designers get in touch with one another, we search for the best new styles and trends. We also help with the practical production of many designs by up and coming textile and fashion designers. Textile Laboratories: Knitting, Silkscreen printing, felting, weaving, dying, sewing, laser cutting. In addition, we are planning an exhibition space, an artists in residence programme, and designers' co-working spaces.
Sanjotec Design Lab (São João da Madeira, Portugal)	Sanjotec Design Lab is focused on encouraging the development of new products based on inventions/patents/knowledge already available in Universities and R&D Centers from regional and international entities.
Textile Centre of Excellence (Design Lab) (Huddersfield, United Kingdom)	The Design Lab has the full range of utilities to enable any designer or aspiring designer to research/develop and grow and achieve industry ready product and skills. Equipped with work benches/pattern cutting paper/card/pattern cutting tools, toile dummies and electrical connections/desks for laptops and great lighting, this space is ideal to transform ideas into reality. The space can be used effectively for every step of the design process. We also offer industry standard practical, creative support and training for peace of mind or to help candidates to gain essential skills/training in relevant areas.
Textile Museum of Prato (Prato, Italy)	The starting hypothesis is to build on the Inspiring Lab developed in the Texmedin project, which developed a database of heritage designs that young designers can use as an inspiration for new textile patterns and clothing models. The idea is to dedicate a corner of the Textile Museum to setting up work stations equipped with CAD programmes and heritage databases. The main issue is to develop a service/business model to cover the long-term operations in addition to the necessary staffing and overhead costs. The challenge is to appeal to the textile enterprises in the Prato district, addressing their more strategic needs through a service design approach.
TextileLab Amsterdam - Academy	TCBL Academy is a series of workshops which aim is to explore how digital fabrication in combination with old craftsmanship in the field of T&C can influence the process and work of the participants that will be following it.



TCBL Design Labs

TCBL Handbooks
Textile & Clothing Business Labs

Lab	Brief description
(Amsterdam, Netherlands)	Bringing together experts, designers and researchers that are exploring new ways of producing and pushing the boundaries in this field and participants that are exploring new options.

3. THE THEORETICAL FRAMEWORK

In the above definition, design is considered with a very broad scope and a wide range of possible applications in TCBL pilot scenarios. In the following sections, we explore the theoretical framework for Design Labs by looking at some of the reference models concerning design itself.

FASHION DESIGN

Fashion is a form of ugliness so intolerable that we have to alter it every six months.

Oscar Wilde

Fashion eludes easy definition. Broadly, fashion can be understood as shifting styles of dress — that is, specific combinations of silhouettes, textiles, colours, details, and fabrications — embraced by groups of people at a particular time and place. Such styles may be projected by a designer or emerge from the street. Fashion can also be viewed as the entire system of innovation, production, marketing, dissemination, and adoption. Fashion is both a creative endeavour and a product; or, put in another way, it is an aesthetic practice that produces useful, and sometimes lucrative, objects. On the one hand, a craft or an art form; on the other, a multibillion-dollar worldwide business.¹

Fashion theory tries to link scientific methods and creative design processes in a productive way, in order to establish a self-reflective form of cultural practice. Complex value concepts in fashion are transferred from the object to the viewer in a communicative way. This communication is not realized in one direction but is based on reciprocal interaction between the designer, object and viewer. Fashion incorporates categories of creative techniques and innovative processes as well as the potential for social exchange.²

Fashion design operates as part of a structured, international fashion industry. Industrial and technological innovations have contributed to the setting up of more and more efficient supply chains, in which each business fulfils a price category to serve a fashion retail niche.

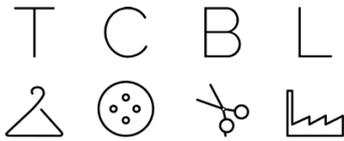
Fashion is frequently associated with seasonal trends. In the context of fashion design this may be understood as a dominant 'look' or prevailing style or colour that give rise to a sense of collective dressing at a given time. The visual impact of collective dressing might prompt a defining silhouette for men or women. This is usually informed by a shift in body proportions or the introduction of a new shape that might be defined by the cut of a jacket or coat. The process is further informed and supported by media communication channels including fashion and style magazines, advertising and the Internet. Fashion and styles change over time in response to a mix of external and social influences or stimuli, so that being 'in fashion' becomes transitory. The fashion industry is not a passive bystander in this regard but is motivated by a range of commercial interests towards supporting continuous seasonal changes that, over time, may be viewed as cyclical stages.³

The creation of a fashion collection follows a cycle of design, construction, and production, leading from concept to finished garment. Informed by the broader choices for their practice, designers chart a course through myriad decisions and refinements, both practical and intuitive. The careful selection of colours and materials, combined with ideas for overall shapes and proportions, will set a strategy in motion for the development of a prototype that manifests what

¹ Kennedy A., Stoehrer E.B., Calderin J. (2013) *A Visual Guide to the History, Language & Practice of Fashion*, Rockport Publishers.

² Loschek I. (2009) *When Clothes Become Fashion: Design and Innovation Systems*, Berg Publishers.

³ Hopkins J. (2012) *Fashion Design: The Complete Guide*, AVA Publishing



has only been envisioned. Drafted or draped, a pattern emerges, and a sample is stitched, fitted, and finished. If judged production worthy, the pattern is adjusted for replication in different sizes and at scale. As the collection moves into the factory setting, new samples test the quality and consistency of the work before commencing on production and distribution. Some large fashion companies have successfully integrated design, prototyping, construction, and distribution into a single operation. In most cases, however, production is outsourced, often to factories in foreign countries. In the end, designers must balance issues of cost, productivity, culture differences, technologies, delivery systems, and ethics.

The systems currently in place in the fashion industry are constantly being questioned and reviewed to meet the needs of the industry, the public, and the planet. While the industry as a whole has begun to address issues of sustainability, designers today actively engage in practices that are altering preconceptions about the designed object.

Sustainability occupies an integral but still-evolving position in the fashion debate. The fragmented nature of the apparel business poses real challenges to creating a sustainable strategy. There are many possible, often overlapping approaches, each with advantages and disadvantages for an industry that thrives on consumption. Considerations include practices towards the reduction of energy use and toxic emissions, the promotion of durability over disposability, the improvement of trading conditions in developing countries and advancement of social equality everywhere, the promotion of local resources and local talents, the elimination of waste through recycling or upcycling.⁴

Innovations are possible at several levels in the fashion system: at the stylistic, idealistic and conceptual levels as well as in production and cutting technology or in materials. Meanwhile, the accelerated pace of technological change allows designers to rethink the possibilities for fashion with garments that are evermore innovative and extraordinary.

DESIGN THINKING

Design Thinking is one of the most fascinating concepts currently under discussion in management discourse: human-centred and based on new facilitation methods and spatial concepts. The Design Thinking concept emerged at the Stanford University, in the heart of Silicon Valley, where the combination of technology and human-centeredness has determined the success of many tech enterprises and Internet giants. The evolution from design to design thinking is the story of the evolution from the creation of products to the analysis of the relationship between people and products, and from there to the relationship between people and people.⁵

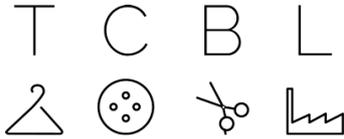
Tim Brown, CEO of IDEO, one of the leading innovation consulting firms using Design Thinking. from Palo Alto in California, defines it as “a discipline that uses the designer’s sensibility and methods to match people’s needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity”.⁶

Design Thinking is interdisciplinary, based on knowledge and insights from engineering, management, industrial design, anthropology, information management, and ethnography. It is a design methodology integrating human, business, and technological factors in problem

⁴ Kennedy, Stoehrer, Calderin 2013, *op.cit.*

⁵ Brown T. (2009) *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation*, HarperCollins Publishers.

⁶ *Ibid.*



forming, -solving, and -design blending an end-user focus with multidisciplinary collaboration and iterative improvement to produce innovative products, systems, and services and allowing design innovation processes comprehensibly. The term Design Thinking is generally referred to as applying a designer's sensibility and methods to problem solving, no matter what the problem is.

This methodology offers a platform to answer different questions from areas such as problem-solving, design of business models, facilitation, mediation, visualization, and innovation in one process. The objective is to involve consumers, designers, and businesspeople in an integrative process, which can be applied to product, service, or even business design.

Design Thinking is, despite its broad base, ultimately a pragmatic method based on a few simple principles. Iterative development, contact with humans, and visualization of results as prototypes are examples of these principles.

Design Thinking can be defined as:

- a mindset, characterized by several key principles: a combination of divergent and convergent thinking, a strong orientation to both obvious and hidden needs of customers and users, and prototyping.
- a process, as a combination of a micro- and a macro-process. The micro-process—as innovation process per se — consists of these steps: “Define the Problem”, “Need finding and Synthesis”, “Ideate”, “Prototype” and “Test”. The macro-process consists of milestones manifested in prototypes that must fulfil defined requirements.
- a toolbox, referring to the application of numerous methods and techniques from various disciplines: design, but also engineering, informatics, and psychology.

Design Thinking is about the creation of, as well as adaptive use of a body of behaviours and several key values:

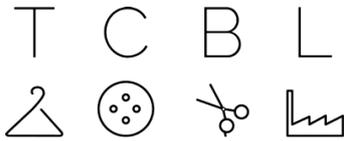
- *Be visual/physical*: design thinkers seek new ideas and refinement through making visual drawings, or physical prototypes.
- *Iterate*: build on different ideas, go through the design stages more than once, prototype, prototype, prototype.
- *Be multidisciplinary*: accept a multidisciplinary view of design, emphasizing collaboration between people with different types of expertise.

Today, a growing number of companies, consulting firms, and universities use Design Thinking, continuously enlarging and re-defining its meaning. In the near future, Design Thinking is expected to be deployed as an innovative method in corporations and also become an integral part of management education, particularly innovation. In addition, it will be developed further at the interface of design, design management and engineering sciences.

SERVICE DESIGN

The Service Design Network defines its activity as that: “...of planning and organizing people, infrastructure, communication and material components of a service in order to improve its quality and the interaction between service provider and customers. The purpose of service design methodologies is to design according to the needs of customers or participants, so that the service is user-friendly, competitive and relevant to the customers.”⁷

⁷ Service Design Network, <https://www.service-design-network.org/>.



In the developed countries, the service sector is about 75% of the economy. This is where most of the new jobs are created. Service design focuses on the creation of integrated services, rather than isolated products. It is becoming, to an increasing degree, a key competitive advantage. Physical elements and technology can easily be copied, but service experiences are much harder to be replicated as they are deeply rooted in companies' culture and based on the user experience. Just as industrial design fuelled the introduction of new products to the masses in the industrial economy, good service design is key to the successful introduction of new technologies. In the service economy, services can be redesigned on a continuing basis to keep a competitive edge in the market. Some of the greatest opportunities are found where a business model can be changed from a product model to a service model.

Service design follows a tradition of human-centred design, with roots in early manufacturing, architecture and industrial design. It offers a clear set of solid principles and methods that support service effectiveness and efficiency in creating holistic services contributing to improve the citizen experience. It succeeds because it delivers a good experience for both the user and the service provider. The services are designed with the users, who are directly involved in the design and development of the service, through participatory design approaches. Service design is all about taking a service and making it meet the user's and customer's needs for that service. It can be used to improve an existing service or to create a new service from scratch.

Service design is an interdisciplinary approach that combines different methods and tools from various disciplines, ranging from ethnography⁸ to information and management science⁹ to interaction design¹⁰ to service development, management, operations and marketing¹¹ It is a new way of thinking as opposed to a new stand-alone academic discipline. Service design is an evolving approach, this is particularly apparent in the fact that, as yet, there is no common definition or clearly articulated language of service design.¹²

In this context, useful starting points are five principles of service design thinking:

- *user centred*: services should be experienced through the eyes of the customer.

⁸ Segelström F., Raijmakers B., Holmlid S. (2013) *Thinking and Doing Ethnography in Service Design*, Linköping University, Department of Computer and Information Science Sweden. See also Ylirisku S., & Buur J. (2007) *Designing with video: Focusing the user-centred design process*. London: Springer; and Buur, J., Binder T., et al. (2000). "Taking Video beyond "Hard Data" in User Centred Design." Design. Participatory Design Conference (PDC2000).

⁹ Morelli N. (2006) "Developing new PSS, Methodologies and Operational Tools", *Journal of Cleaner Production* 14(17), 1495–1501.

¹⁰ Holmlid S. (2007) "Interaction design and service design: Expanding a comparison of design disciplines." In *Proceedings from Nordic Design Research Conference*, Stockholm. See also Parker S., Heapy J. (2006), *The Journey to the Interface – How public service design can connect users to reform*, Demos.

¹¹ Edvardsson B., Gustafsson A., Roos I. (2005) "Service portraits in service research: a critical review", in *International Journal of Service Industry Management* Vol. 16 No. 1, pp. 107-121. See also Mager B. (2005) *Service Design: a Review*, available through: <http://sedes-research.de/birgit-mager/>; and Edvardsson B., Gustafsson A., Johnson M., Sanden B. (2000) "New Service Development and Innovation in the New Economy", in *International Journal of Service Industry Management*, Vol. 12 Iss: 5, pp.522 – 528.

¹² Stickdorn M., Schneider J. et al (2011) *This is service design thinking. Basics Tools Cases*, BIS Publishers.

- *co-creative*: involving stakeholders to explore needs and new processes, with the customer at the centre of the scene.
- *sequencing*: how the service impacts the mood of the customer.
- *evidencing*: making customers aware of intangible services
- *holistic*: keeping the mood and feelings of the customer in mind throughout the service journey.

Service design is, in contrast to service development, described as a human-centred approach and an outside-in perspective¹³. It is concerned with systematically applying design methodology and principles to the design of services¹⁴. Service design integrates the possibilities and means to perform a service with such qualities, within the economy and strategic development of an organization. A service designer can “visualise, express and choreograph what other people can’t see, envisage solutions that do not yet exist, observe and interpret needs and behaviours and transform them into possible service futures, and express and evaluate, in the language of experiences, the quality of design.”¹⁵ Service Design thus uses tools and methods that are not rigid protocols to be followed unthinkingly, but frameworks that can and should be adapted to the task at hand. Some of these tools and methodologies are shown below.¹⁶



Figure 1: Service Design Tools and Methods

¹³ Mager B. (2005) *op cit*. See also Holmlid S., Evenson S. (2006) “Bringing design to services” Invited to IBM Service Sciences, Management and Engineering Summit: Education for the 21st century. New York, October.

¹⁴ Bruce M., Bessant J. (2002) *Design in business: Strategic innovation through design*. Design Council, UK. See also Holmlid S., Evenson S. (2006) *op cit*.

¹⁵ <https://www.service-design-network.org/>

¹⁶ <http://www.servicedesigntools.org>

DESIGN FOR SUSTAINABILITY

There are professions more harmful than industrial design, but only a very few... by creating whole new species of permanent garbage to clutter up the landscape, and by choosing materials and processes that pollute the air we breathe, designers have become a dangerous breed... In this age of mass production when everything must be planned and designed, design has become the most powerful tool with which man shapes his tools and environments (and, by extension, society and himself). This demands high social and moral responsibility from the designer.

Victor Papanek¹⁷

Design for sustainability offers a new and broader context for designing. It is about more than recycling or using recycled materials. Design for sustainability has received considerable attention in recent decades due to a range of worldwide crises which have manifested themselves as political problems: climate change, famine, disease and poverty.

The concept of design for sustainability first emerged in the 1960s when Packard (1963), Papanek (1971), Bonsiepe (1973) and Schumacher (1973)¹⁸ began to criticize modern and unsustainable development and suggest alternatives. The second wave emerged in the late 1980s and early 1990s and coincided with the green consumer revolution.

Birkeland (2002)¹⁹ provides keys points by presenting a new vision for design which is:

- *Responsible* – redefining goals around needs, social/eco equity and justice.
- *Synergistic* – creating positive synergies; involving different elements to create systems change.
- *Contextual* – re-evaluating design conventions and concepts towards social transformation.
- *Holistic* – taking a life cycle view to ensure low impact, low cost, multi-functional outcomes.
- *Empowering* – fosters human potential, self-reliance and ecological understanding in appropriate ways.
- *Restorative* – integrates the social and natural world; recultivates a sense of wonder.
- *Eco-efficient* – proactively aims to increase the economy of energy, materials and costs.
- *Creative* – represents a new paradigm that transcends traditional boundaries of discipline thinking; to 'leapfrog'.
- *Visionary* – focuses on visions and outcomes and conceives of appropriate methods, tools, processes to deliver them.

There is also a growing global demand for sustainability features in products and services. Incorporating issues of design for sustainability into product design can offer organisations the opportunity to enhance their sustainability performance, while simultaneously improving their profitability, by reducing the environmental impact of their products/processes, improving raw material consumption and energy use, cutting costs, satisfying user needs, increasing product marketability and finally improving the image of organizations.

¹⁷ Papanek V. (1971) *Design for the Real World: Human Ecology and Social Change*, Pantheon Books.

¹⁸ Packard V. (1960) *The Waste Makers*, David McKay, Papanek (1971) *op cit*,

https://en.wikipedia.org/wiki/Gui_Bonsiepe, and Schumacher E.F. (1973) *Small Is Beautiful: A Study of Economics as If People Mattered*, Blond & Briggs.

¹⁹ Birkeland J. (2002) *Design for Sustainability: A Sourcebook of Integrated, Eco-logical Solutions*, Earthscan.

Design for sustainability can also provide a means for establishing a long-term strategic vision of a company's future products and operations. In general, sustainable design is an enabling force to shape more sustainable patterns of production and consumption. It also provides the opportunity for organisations to increase innovation, it can offer a greater ability to compete, add value and attract customers, and enable them to become more cost-effective by reducing environmental impacts and potential liability.²⁰

By incorporating design for sustainability into product design and development, organisations gain a fresh perspective on established practices, resulting in new ideas and solutions. For example, this can result in:

- New product and/or service concepts.
- Alternative production techniques.
- Increased employee participation and satisfaction.
- Greater employee creativity.

Design for sustainability often identifies opportunities for cost-reduction across many stages of a product's life and ensures the greatest reductions are achieved. The results are often reduced production costs, increased product quality, and increased return on environmental investments.

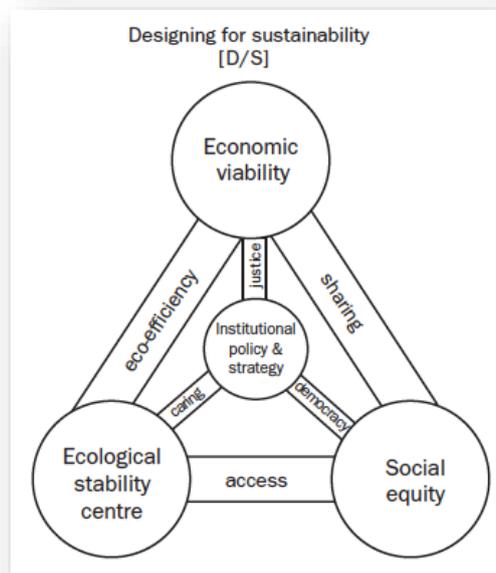
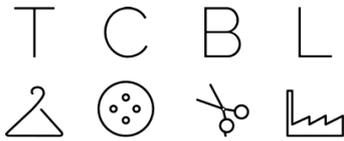


Figure 2: The Sustainability Prism²¹

By decreasing a product's impact on the environment design for sustainability helps companies to ensure compliance with environmental regulations, reduce uncertainty with respect to future environmental requirements, achieve better community relations and contribute to a better local, regional and global environment.

²⁰ Bhamra T., Lofthouse V. (2007) *Design for Sustainability, A Practical Approach*, Gower.

²¹ *Ibid.*



Finally, there is also the opportunity with design for sustainability for an organisation to gain a systems view of their business. Design that focuses on a product's life cycle helps companies create clear links between product design, supply chain management and sales/marketing, providing a mechanism for multidisciplinary teams to continuously improve products. In practice, Design for sustainability enfold different approaches. The most relevant (often overlapping) ones are described in the following paragraphs.

ECO-DESIGN

Eco-design is a design process that considers the environmental impacts associated with a product throughout its entire life from acquisition of raw materials through production/manufacturing and use to end of life. At the same time as reducing environmental impacts, eco-design seeks to improve the aesthetic and functional aspects of the product with due consideration to social and ethical needs.

GREEN DESIGN

Green design is a design process in which the focus is on assessing and dealing with individual environmental impacts of product rather than on the product's entire life. Green design encompasses different approaches to improve processes and products to make them more efficient from an environmental standpoint. Every one of these approaches depends on viewing possible impacts in space and time and using assertive design approaches to prevent or ameliorate them.

CRADLE TO CRADLE

Traditionally, design for sustainability has focused on minimising environmental damage, with the ultimate aim being to achieve zero-waste. However, McDonough and Braungart (2003)²² argue that the problem with this approach is that it results in destroying the environment 'a bit less' rather than stopping the destruction all together. They propose a cradle to cradle approach to design, through which the outputs (or waste) from one system become the inputs (nutrients) for other processes or products. According to this approach, industrial products must be designed to fit into one of two cycles: a biological cycle, where the loop is closed by returning products harmlessly to nature through composting; and an industrial cycle, where the loop is closed by recycling non-degradable materials and products completely and continually. The cradle-to-cradle approach is also at the base of what is now referred to as Circular Economy thinking.²³

FROM PRODUCTS TO SERVICES

In order to significantly reduce their environmental impact, several organizations are looking for alternative methods of delivering product function, moving from products to services. Many authors agree that a move to services can provide the opportunity for the introduction of concepts that significantly improve the environmental performance of production and consumption systems.²⁴ This shift in the manufacturer's role from providing products to

²² McDonough W., Braungart M. (2010) *Cradle to cradle: Remaking the way we make things*, MacMillan.

²³ <https://www.ellenmacarthurfoundation.org/circular-economy>

²⁴ Goedkoop M.J., Van Halen C.J.G., Te Riele H.R.M., Rommens P.J.M. (1999) *Product Service Systems, Ecological and Economic Basics*, Report of Storm CS Consultants commissioned by the Dutch Ministries of Environmental and Economical Affairs.

providing services is also known as the 'functional economy', and has been linked to the creation of a more environmentally sustainable economy. This is not only one in which customers are users of function and services rather than consumers of product, but also one where the economic objective is to create the highest possible use value for the longest time while consuming as few resources as possible.²⁵

PARTICIPATORY DESIGN

Participatory design has evolved independently of eco-design, a design approach that considers the environmental impacts of the whole product life cycle. The two are brought together in design for sustainability, which adds an explicit emphasis on social responsibility to the environmental and ecological concerns of eco-design. The participatory design approach fits with the Agenda 21 approach to achieving sustainable development, which emphasizes the importance of involving whole populations in broad processes to achieve large-scale change. The assumption is that without shared visions only short-term solutions are possible and these are unlikely to be the most sustainable solutions. Shared visions, reached through collaborative processes like participatory design, are most likely to deliver sustainable solutions of long-term value.²⁶

DESIGN ACTIVISM

Design activism encompasses a wide range of real-life, socially and environmentally engaged actions. It includes processes that innovate forms of creative practice, providing models by which designers might work, or challenge existing conventions of design knowledge. The emerging notion of design activism attempts to account for the often radical ways in which design is being used to transform our society and the way we live, both now and for the future²⁷. Design activism is characterized both by its clear intent (the social or ecological cause being pursued) and the often radical nature of its practice (how design is used, and by whom). Design activism is design that explicitly supports a particular cause, which is outside the core concerns of mainstream, commercially driven professional design practice. A good example is the 'Who made my clothes?' campaign of Fashion Revolution.²⁸

EMOTIONALLY DURABLE DESIGN

Emotionally durable design explores the idea of creating a deeper, more sustainable bond between people and products and extends their 'use-career'. Product durability is as much about desire, love, fascination and attachment. This approach reduces the consumption and waste of natural resources by increasing the resilience of the ties established between consumers and products, supporting not the design of durable 'products' per se, but the design of durable meanings and values that products deliver. Emotionally durable design provides a useful language to describe the contemporary relevance of designing responsible, well made, tactile products which the user can get to know and assign value to in the long-term.²⁹

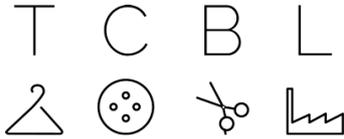
²⁵ Stahel W. (1997) *In the Industrial Green Game: Implications for Environmental Design and Management* National Academy Press, Washington, DC.

²⁶ Chick A., Micklethwaite P. (2011) *Design for Sustainable Change: How design and designers can drive the sustainability agenda*, AVA Publishing.

²⁷ Ibid.

²⁸ <http://fashionrevolution.org/>

²⁹ Chapman J. (2015) *Emotionally Durable Design: Objects, Experience & Empathy*, Routledge.



RELEVANCE OF BACKGROUND MODELS TO TCBL

The following table summarizes the relevance of these models to TCBL in general and to the Design Labs in particular.

Model	Relevance to TCBL
Fashion Design	Fashion Design is clearly a central element of TCBL's activities, but can also overshadow the importance of other aspects of design. Design Labs will strive to open the confines of fashion design as well as making the practice of design more accessible.
Design Thinking	Design Thinking can be applied to pilot scenarios as well as Design Labs themselves, and demonstrates the broad applicability of the design approach.
Service Design	Service Design may also be applied to TCBL services as well as new paradigms for the retail aspect of fashion, in a framework of 'clothing as a service'.
Design for Sustainability	Design for sustainability will be fundamental in linking TCBL to the Circular Economy movement and more generally for attaining our objective of a 20% reduction in the ecological footprint of the T&C sector.

DOCUMENT INFORMATION

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STATEMENT OF ORIGINALITY

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