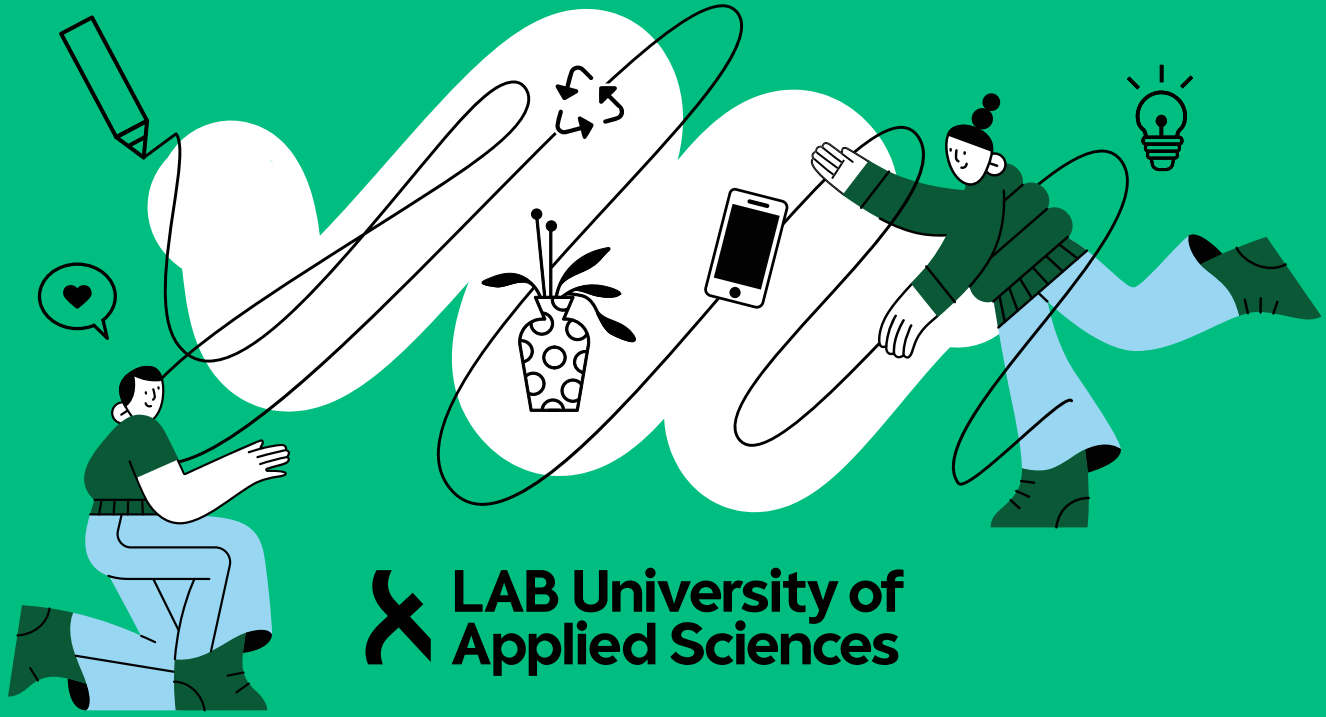
Kristiina Soini-Salomaa (ed.)

LAB Design Annual Review 2022

The Publication Series of LAB University of Applied Sciences, part 57



LAB University of Applied Sciences

LAB Design
Annual Review
2022

LAB University of Applied Sciences

The Publication Series of LAB University of Applied Sciences, part 57

Editor-in-chief: Minna Suutari
Technical reviewer: Johanna Kiviluoto
Layout: Mervi Koistinen
ISSN 2670-1928 (PDF)
ISSN 2670-1235 (print)
ISBN 978-951-827-435-6 (PDF)
ISBN 978-951-827-436-3 (print)
Lahti, 2022

Contents

About the Authors

Markus Ahola, PhD (Design), works as a chief specialist in customer experience at LAB University of Applied Sciences. In this position, he fosters flourishment of experience-driven thinking in LAB's RDI and education. His research concentrates on human safety experiences and human experiences in technology-oriented environments. In addition to research, he is active in developing multidisciplinary research and education collaboration and has contributed to many platforms between industry and academia.

Enna Eloranta, BA (Design), is a project coordinator at LAB University of Applied Sciences, Institute of Design and Fine Arts. Her main focus is on sustainable design with human-centered design and visual communication.

Helena Kalliomäki, MA (Culture and Arts) works as a RDI specialist and project manager at LAB University of Applied Sciences, Institute of Design and Fine Arts. She has long experience as a fashion designer with Finnish and international brands. Her core interest is how to design for transformation through design thinking. She is familiar with novel circular concepts and sustainable solutions in the textile and clothing sector.

Mervi Koistinen, BA (Design), is RDI specialist at LAB University of Applied Sciences, Institute of Design and Fine Arts. She mainly works on visual communication design in RDI projects. Her expertise covers a wide range of forms from graphic and information design to user experience design and content creation. She is interested in sustainable development and user-centered way of thinking.

Kati Kumpulainen, MA (Culture and Arts) works as a RDI specialist and project manager on projects related to service design and sustainable user-driven product and service development in LAB University of Applied Sciences, Institute of Design and Fine Arts. She is interested in service design and sustainable design and helps enterprises, public sector operators and other entities take advantage of design in their business.

Mirja Kälviäinen, PhD (Arts and Culture) is a principal lecturer and course leader for the MA level design thinking and customer experience studies at the LAB University of Applied

Sciences, Institute of Design and Fine Arts. She has also adjunct professorship nominations in two other Finnish universities. Her research work has included methods for user-driven design, design thinking and service design with front end innovation process and co-design applications. During the last ten years her research and development activities have concentrated especially on design for environmentally sustainable behaviour change.

Katariina Mäenpää, PhD (BA) is a RDI specialist and project manager in LAB University of Applied Sciences, Institute of Design and Fine Arts. Her background is in-depth marketing and consumer behavior boosted with studies in Psychology and Sociology. She is familiar with innovations and inventiveness, advanced banking services, digital marketing, EU projects, service design and co-creation.

Paula Nurminen, BA (Industrial Design) student of MA (Design thinking), is a project coordinator and project manager at LAB University of Applied Sciences, Institute of Design and Fine Arts. Multidimensional and creative thinking and combining things are her strengths. Co-design, design thinking and systems thinking are her passions.

Katariina Pakarinen, MA (Design) works as a RDI specialist and project manager at LAB University of Applied Sciences, Institute of Design and Fine Arts. Katariina's primary interests and core competences are design thinking and user experience. She is also enthusiastic about service design and data visualization.

Anna Palokangas, BBA (Business), BA (Product Design), is a service designer who works as a RDI specialist and project manager at LAB University of Applied Sciences, Institute of Design and Fine Arts. In her work her main interest is combining sustainable design, customer experience and design for behavioral change.

Lotta Pyykkönen, MA (Cultural Research), BA (Fine Arts), works as a leader of Art for Change-platform and lecturer of Fine Arts at the LAB Institute of Design and Fine Arts. Her main research interest is the role of art in society, specifically artist's position and competences in the society and in the cultural field.

Marion Robinson, MA (Visual Communication), is a senior lecturer at LAB Institute of Design and Fine Arts. Her research focuses on typography and communication with a special interest in language, writing systems, emotions, and communication platforms such as books. She explores these themes with students and in her own visual research in both art and design projects.

Annariina Ruokamo, MA (Art and Design), is a RDI specialist and a part-time teacher at Wearable Design programme at the Institute of Design and Fine Arts at LAB University of Applied Sciences. She has worked in several Finnish clothing companies as a designer and as a sustainability advisor. Her interests lie in sustainable and circular design and in concrete tools and actions for creating sustainability through design.

Kristiina Soini-Salomaa, PhD (Education) is a RDI director for design focus area at LAB University of Applied Sciences. Her main research and professional interests are strategic development of RDI activities, design research, design thinking methodologies, future studies and forecasting.

Aino Vepsäläinen, MA (Design), works as a chief specialist of the Design for Sustainable Business platform at the LAB University of Applied Sciences, Institute of Design and Fine Arts. She has more than 15 years experience in tasks and projects of promoting design and its uses, with a focus in Finnish SMEs. She has worked as an expert and project manager in national and international projects related to strategic design, circular economy and sustainable development. Her special interest is in circular design and its methods.

Kristiina Soini-Salomaa

Foreword

Spectrum of research and development activities in the design focus area

This is the third review of the publication series named LAB Design Annual Review, which presents the latest research, development and innovation activities in the context of design written by experts from LAB University of Applied Sciences. This review presents some of the latest achievements made as part of our projects to reach the strategic development goals.

In the first article Kristiina Soini-Salomaa opens up the premises and synergies of design thinking, foresight and strategic planning. The article discusses the future orientation inherent in design and its possibilities to support organisations' abilities to change in a complex environment. The complex environment is described using the VUCA concept, which means a world where volatility, uncertainty, complexity and ambiguity challenge an organisation's strategic planning. Few project examples are also presented focusing on organisations' future thinking and transformational capabilities.

The second article by Markus Ahola portrays the idea of the Customer Experience Platform which established at the LAB University of Applied Sciences in 2022. Human experiences extend to all areas of human living, and a positive customer experience provides long-term business success. The article highlights the multidisciplinary research approach of experience in every stage of the RDI process. Katariina Pakarinen's article continues with the themes of need- and customer-oriented competence development. The project, Continuation - Lifelong education and competence building is introduced, it develops needs-based continuing education anticipating future requirements and developing customer-oriented training models with the help of design thinking tools. The first training pilots were tested and developed with customers during spring 2022.

Currently, both traditional education as well as regeneration of knowledge and skills in practice are challenged by digitalization. LEADBEHA project has produced

new training modules for the companies and other organizations based on the needs for flexible master's degree studies to maintain and improve the skill of their employees and respond to the challenges of the competitive environment. The article by Katariina Mäenpää concentrates on LAB Design Institute's contribution on the project. The author continues with another paper discussing the possibilities of gamification in the fields where games are not usually present. The project utilised the growth potential, development methods, and the technical and service-related innovations of the gaming industry, as well as gamification itself, to develop other industries and pandemic-resilient education in order to bring about continuing behavioural change.

The need for sustainable solutions is undeniable and more needed than ever. The consequences of the climate change create global challenges that affect everyone regardless of geographic location or nationality. The effects have a significant impact not only on the environment but also on social and economic levels. In the next article Aino Vepsäläinen discusses how Design for Sustainable Business growth platform focuses on the role of design in the current operating environment as well as in the future. The targets for sustainability and circularity are described.

Good practical project examples for the environmentally responsible, customer-orientated product and service development in small and medium-sized companies are presented in the article by Mirja Kälviäinen, Anna Palokangas, Kati Kumpulainen and Enna Eloranta. The support for companies is provided by training them in customer-driven design and in the development of environmentally responsible products and service solutions that help customers lower their environmental harm. The training includes also concrete tools for responsible communication.

Continuing with the sustainability themes the paper by Mirja Kälviäinen introduces one development case which is part of the Ministry of the Environment's Suburban Research Project. The case looks at the Lahti Houses rental organisation's possibilities to develop behaviour-changing measures to reduce the carbon footprint of their residents. In the project, the aim was to create ways to inspire residents living in rented apartment buildings to save water and electricity and sort waste appropriately. The development case served as an example of companies' carbon handprint and extensive social and environmental responsibility.

The textile industry is one of the largest producer of carbon dioxide emissions. In recent years, the textile industry has invested in circular design and manufacturing. LAB University of Applied Sciences is a partner in Telavalue project and network. The network enables the development of circular economy business models and the national circular economy system in Finland. Annariina Ruokamo's article reviews how to study the environmentally impactful use phase of clothing. The design process in circular economy business models and garment's

lifespan is studied in the project. The author continues with the sustainability themes of textiles. Digitality is seen as one of the key elements in the transition to more agile and sustainable textile and clothing business. Annariina Ruokamos's second article introduces Digital & Sustainable Fashion Showroom project and dives into the phenomena of ever-changing consumer behaviour and solutions for companies to tackle the changing ways of consuming fashion.

The circular economy and sustainable business are seen as the solution to tackling the challenges related to climate change. The Product as a Service model is at the heart of the circular economy, alongside materials recycling and reducing consumption. Increasing the number of uses and extending the life cycle of products such as textiles and clothing can significantly contribute to sustainability and a sustainable future. The article by Helena Kalliomäki examines the principles of the Product as a Service model (PaaS) and argues for the vital shift from owning goods to rental services, especially in the textile and fashion sector.

Interesting material research is also carried out in the Design focus area. Mervi Koistinen and Paula Nurminen introduce the The Hiukka 2.0 project. It aims to study the possibilities of hair material in replacing plastic-based materials and share knowledge about creating businesses in accordance with the principles of the circular economy. As part of the project, a training pilot for sustainable business is developed, which will increase tunderstanding and know-how about circular economy and upcycling hair waste.

The last two articles describe the perspectives of visual and artistic research and development at LAB University of Applied Sciences. Lotta Pyykkönen discusses the goals and themes of the Arts for Change platform. The article discusses the concept and purpose of public art as well as the impact associated with it from the perspective of publications and topical discussion.

At the Institute of Design and Fine Arts, corporate collaboration has a long tradition and takes many forms. The Graphic Design Department teamed up with print house Markprint to design memorable printed communication materials. An illustrated card sample set was created. The article of Marion Robinson n is a look into a process that started in early 2021 and the final designs, published in 2022.

I warmly thank all the authors who made it possible to publish this review. I hope that this review gives you some new insights and further ideas for design education, research and development in the fields of sustainability, customer experience and possibilities of public art.

Lahti, 25 November, 2022

Dr. Kristiina Soini-Salomaa
RDI Director, Design

Kristiina Soini-Salomaa

Design for Strategic Foresight

Abstract

This article opens up the premises and synergies of design thinking, foresight and strategic planning. The philosophy of design thinking is taking many different perspectives, methodologies and expertise into account. Future studies and foresight are also multidisciplinary and interdisciplinary in nature. This article discusses the future orientation inherent in design and its possibilities to support organisations' abilities to change in a complex environment. The complex environment is described using the VUCA concept, which means a world where volatility, uncertainty, complexity and ambiguity challenge an organisation's strategic planning. In a VUCA world, organisations can no longer focus on internal learning and instead should focus on co-creative and collaborative learning outside the boundaries of the organisation. Finally, a few project examples are presented that focus on organisations' future thinking and transformational capabilities.

Keywords: Strategic design, design thinking, foresight, transformational capability

Strategic Design

Design thinking involves the acquisition of diverse development knowledge for ideas of vision-based solutions and synthesised construction (Brown 2009, 64–71). The philosophy of design thinking means considering many different perspectives and building a comprehensive understanding of challenges and demands. Research and development activities can be focused on user experience, customer demands, producer possibilities or social requirements. Transformational capability and foresight are also increasingly needed.

Strategic design includes activities that integrate systems of products, services and communications in organisations. It is highly dependent on shared value creation across different groups of participants, clients and relevant stakeholders (Manzini & Vezzoli 2003; Meroni 2008). As a decision-making tool, strategic design activities enable a designer to consider hard constraints imposed by an organisation (internal environment) against ecological and social impacts, and the cultural sensibilities and symbolic meaning that inform external environments in a rapidly changing society

(Meroni 2008; Buhring 2017, 1118).

Strategic design has played a key role in shifting the innovation focus from product design to an integrated product service solution. However, due to globalisation, technological advancements, and a power shift towards the consumer, increasing business complexity and the associated risks place new demands on strategic design to go beyond satisfying short-term innovation goals (Manzini & Meroni 2007). Indeed, strategic design activities applied to foresight may offer decision-makers a holistic view on looming issues. It is here where creative thinking, visualisation and prototyping techniques can further advance images of futures that are preferable (Manzini & Vezzoli 2003).

Design-inspired foresight

The combination of anticipation-innovation -communication is called future thinking, which is important in the future work of every organisation. Anticipation helps us prepare for different futures. Innovation and communication are connected to making the future. With the help of foresight, the aim is to think about different possible future worlds and scenarios that the organisation should prepare for. Scenarios are produced by combining megatrends, trends, weak signals and wild cards in different ways, while thinking about what the signs can mean for the organisation in the future. In the other two activities on future thinking, innovation and communication, organisations aim to influence the future and shape it. In practice, a designer's job is making the future and influencing it (Hiltunen 2021, 10–12).

By combining future thinking and design thinking, companies' innovation and transformational capabilities can be significantly increased. Comparing the business and design practice of dealing with the future, noticeable intersections between strategic planning and strategic design processes are the creation of future value, and the development of perceptions about the future that may inform decisions, or strategies needed to prepare for a desired future. While most organisations fail to look beyond a narrow set of factors, evidence suggests that those which have recognised the value of strategic design as an important resource in the innovation process are indeed those which achieve sustainable competitive advantages (Heskett 2009; Buhring 2017, 1118).

The purpose of employing a design-inspired foresight approach is to combine expert insights with trend analysis and signs of early change, thus developing a deeper understanding of forward-looking perspectives that may help shape the future. Moreover, a design-inspired foresight approach affords opportunities for visualisation and storytelling techniques to enhance the impact of the research findings. Consequently, future thinking and elected foresight techniques may help advance an organisation's readiness and ability to deal with the increasingly uncertain business environment and enhance its anticipatory consciousness (Buhring 2017).

VUCA world

We live in an ever-changing world of uncertainty and complexity. The current world situation and the changes in our operating environment have further accelerated the need to understand and anticipate the future in a VUCA world. Volatility, Uncertainty, Complexity and Ambiguity (VUCA) is a concept that defines the competitive environment of the digital economy in which organisations must adapt past structures to match environmental change. In a VUCA world, organisations can no longer focus on internal learning and instead should focus on co-creative and collaborative learning outside the boundaries of the organisation. Organisations must continually explore the VUCA environment, gaining situational understanding to sense and seize on opportunities and threats (Bennett & Lemoine 2014; Cousins 2018).

Volatility refers to large-scale, frequent change that has no predictable pattern. Change is likely in volatile environments; however, the timing and extent of change are unknown. Uncertainty indicates lack of knowledge related to the frequency and significance of environmental change. In uncertain environments, cause and effect are known; however, timing and magnitude are unknown and may not occur at all. Complexity is related to networks of complex and interconnected parts. To simplify complex situations, organisations should structure themselves to the environment by adapting structures to align with and take advantage of complexity rather than struggle against it. Ambiguity identifies a lack of knowledge of cause and effect where there is no precedent on which to base predictions (Bennett & Lemoine 2014).

The strength of design thinking in such a situation is a culture of versatile searching and experimenting, which does not mean only random and intuitive searching related to creative thinking, but agile design methodologies that utilise many different research methods, emphasising visionary exploration and rapid testing and prototyping. The multi-methodology required for such work makes the designer's research skills demanding, because despite the rapid application of research methods, the systemic integrity should be understood so that the quality of the results not suffer too much. One important feature of searching and experimenting in an uncertain situation is to reframe challenges and opportunities and try to critically examine what, in the uncertainty of the VUCA world, is worth even starting to develop in any development case (Kälviäinen 2021, 28–30).

In situations of complex and multisectoral entities, the designer's work increasingly involves planning and explaining development processes based on design thinking to multidisciplinary working groups and stakeholders. Therefore, the expertise of the designer includes understanding what kind of multidisciplinary participants should be invited to the development. With the help of various methods used in co-design and visual work templates or other ways of concretisation, a designer’s work is more and more focused

on the design of the processes and tools that are needed in multidisciplinary co-design (Kälviäinen 2021, 28-30).

Strategic design in practice

In the design focus area, several projects are underway, which develop companies' future orientations and their ability to change. The COVID pandemic has been a huge global challenge for the whole SME field. In addition to this, the current world situation has further complicated the operating conditions of companies. In this challenging market situation, new tools and approaches are needed. Traditionally, combining foresight thinking and methods with product development processes has been a great challenge for smaller enterprises based on limited resources.

In the EKY (combining foresight thinking to product development) project, foresight and design methods are tailored together to companies' product development activities. New tools and methods are created that are suitable for SMEs' limited R&D resources and can increase companies' resilience amid a wide variety of global challenges or even when aiming for new markets or creating new products. The EKY project conducts practical case studies with local enterprises to test and develop their readiness for enhancing their RDI activities by combining foresight thinking and design methods with their processes. During the project, all learning and new methods will be published to benefit the whole SME field.

In the TUTU workshop (familiarise micro- and small businesses with future skills) project, a company's management and personnel are guided through training sessions to utilise futures thinking and foresight in their own operations. The aim of the training programme is to acquaint the management of micro- and small enterprises and the people working in them with future thinking and to help them see its benefits and opportunities. These include the ability to be more prepared to face the challenges of the future and to better identify the opportunities inherent in a rapidly changing operating environment. The project aims to provide everyone participating in the workshops with methods by which they can apply and utilise future thinking and foresight methods in their own work and businesses.

As a result of the TUTU workshop project, at least 60 people have a greater understanding of future thinking and have deepened their thinking about the future. The project will also result in two webinars where people will learn about future thinking and hear examples from companies on how to apply future thinking in micro- and small businesses. Increased awareness of the future increases the resilience and creative problem-solving of companies and the people who work in them.

In the Lyckan (a future hub for inspiration and rural innovations) project, an innovation centre called Lyckan will be created to develop business models in rural areas. Lyckan will function as a future and inspiration hub and it will strengthen sustainable entrepreneurship in rural communities. The innovation centre will boost start-up activities and it

especially supports SMEs in rural areas. The future hub will be piloted during the project and the hub's permanent activities will be launched. The Lyckan concept combines operators from the circular economy, tourism and creative sectors and implements future and foresight skills in order for them to become more readily available to companies. The project uses human-centred methods to develop a model for innovation work that combines art, design and business.

The project examples above show how novel creative thinking is increasingly needed in a rapidly changing operating environment. By combining future thinking and design thinking with business development, companies' resilience can be strengthened. This also means new competence requirements for design education. A designer's coordinating role in co-development processes with several stakeholders in different ecosystems is growing. Therefore, innovation and information management skills, knowledge of analysis methods and behavioural studies should be strengthened in design education.

References

Bennett, N. & Lemoine, J. 2014. What VUCA Really Means for You. Harvard Business Review. Cited 30 Oct 2022. Available at https://hbr.org/2014/01/what-vuca-really-means-for-you

Brown, T. 2009. Change by Design. How Design Thinking Transforms Organizations and Inspires Innovation. New York: HarperCollins Publishers.

Buhring, J. 2017. Design-inspired Foresight: Strategic foresight techniques for preferable futures. In Bohemia, E., deBont, C. & Holm L.S. (eds.) Research Perspectives on Creative Intersections. Conference Proceedings of the Design Management Academy Conference 2017. Volume 3. 1116-1130. Cited 25 Oct 2022. Available at https://www.academia.edu/33269428/Conference_Proceedings_of_the_Design_Management_Academy_2017_Volume_3

Cousins, B. 2018. Design Thinking: Organizational Learning in VUCA Environments. Academy of Strategic Management Journal. Vol. 17 (2), 1-18. Cited 24 Oct 2022. Available at https://www.proquest.com/docview/2046108661/fulltextPDF/2CD1601850BD4C61PQ/1?accountid=202350

Heskett, J. 2009. Creating economic value by design. International Journal of Design. Vol.

3(1), 71-84. Cited 30 October 2022. Available at http://www.ijdesign.org/index.php/IJDesign/article/view/477/243

Hiltunen, E. 2021. Muotoilija on tulevaisuuden tekijä. In Nurminen, P. & Ruokamo, A. (eds.) Tehtävänä tulevaisuus. Tulevaisuuden muotoilijan työkirja. Lahti: LAB-ammattikorkeakoulu. LAB-ammattikorkeakoulun julkaisusarja, osa 22. 9-12. Cited 25 Oct 2022. Available at https://urn.fi/URN:ISBN:978-951-827-366-3

Kälviäinen, M. 2021. Tutkimuksellisuus tulevaisuuden muotoilijan työssä. In Nurminen, P. & Ruokamo, A. (eds.) Tehtävänä tulevaisuus. Tulevaisuuden muotoilijan työkirja. Lahti: LAB-ammattikorkeakoulu. LAB-ammattikorkeakoulun julkaisusarja, osa 22. 27-30. Cited 25 Oct 2022. Available at https://urn.fi/URN:ISBN:978-951-827-366-3

Manzini, E. & Meroni. 2007. Emerging user demands for sustainable solutions, EMUDE. In Michel, R. (ed.) Design Research Now. Essays and Selected Projects. 157-179. Cited 8 Oct 2022. Available at https://ebookcentral.proquest.com/lib/lab-ebooks/reader.action?docID=3063829

Manzini, E., & Vezzoli, C. 2003. A strategic design approach to develop sustainable product service systems: examples taken from the 'environmentally friendly innovation' Italian prize. Journal of Cleaner Production. Vol. 11(8), 851-857. Cited 30 Oct 2022. Available at https://doi.org/10.1016/S0959-6526(02)00153-1

Meroni, A. 2008. Strategic design: where are we now? Reflection around the foundations of a recent discipline. Strategic Design Research Journal. Vol. 1(1), 31-28. Cited 30 Oct 2022. Available at https://revistas.unisinos.br/index.php/sdrj/article/view/5567/2771

Markus Ahola

LAB's customer experience platform

Abstract

For the growing interest towards immaterial investments in society and the need to pursue human well-being, a *Customer Experience Platform* was established at the LAB University of Applied Sciences in 2022. Human experiences extend to all areas of human living, and a positive customer experience provides long-term business success. The multidisciplinary research approach of experience highlights human perspectives in different roles as customers, users and consumers in every stage of the RDI process. Design discipline has an established history of combining expertise from various fields and involving people in sourcing inspiration, justification and validation for creating solutions for human need fulfilment. LAB's Design unit provides an ideal home for the platform for making LAB's strategy towards experience and expertise flourish.

Keywords: customer experience, RDI, education, multidisciplinary collaboration

Why does customer experience matter?

Experiences are everywhere. We learn through experiences, we easily remember the best and worst experiences, and we experience the world around us all the time. Experiences are the content of our lives, in which services, products and interactive technology often play a significant role. We can influence experiences through design. Comprehensive experience design and research have emerged as one of the central perspectives of designing the interaction between humans, e.g. services, working life and technology (Ahola et al. 2021).

People have been interested in experiences since Aristoteles' time. Roto et al. (2021) extensively studied the distribution of experience research and discovered that *Education and Psychiatry* are traditional research fields contributing to our understanding of experiences. The *Tourism, Leisure & Hospitality Management* research field is naturally interested in human experiences and is one of the largest experience research fields. Interest in experiences in *Public*

Health, Environmental & Occupational Health and *Strategy & Management* fields has grown significantly during the last years. Today *Human-Computer Interaction* (HCI) and *User Experience* (UX) research are among the leading domains publishing research results on the relationship between interactive technology and experiences.

Through this multidisciplinary knowledge, we know that experiences are mediated through services, products and systems, and our design decisions significantly shape experiences. We are living experience economy in which companies and individuals invest in immaterial experiences rather than material possessions. This economy requires understanding the interdependencies involved in a customer journey crossing company functions. How does your company engage customers and create value for them? With experience design, it is possible to identify the gaps between customer expectations and a company's offerings. Collect the required evidence and make sense of the collected multisource data. A high-quality understanding of the psycho-physical, sociocultural and neural phenomena of experience requires multidisciplinary expertise and methodology (Ahola et al. 2021). The LAB University of Applied Sciences has optimal expertise to study experiences from the design, health, innovation and sustainability perspectives. We are here to help your organisation create a successful customer experience strategy, apply it in practice and develop practical solutions to improve customer experience.

Experiences are topical

A quick search into the popular Finnish business publication webpages of *Tekniikka & Talous and Taloussanomat* and *Kauppalehti* reveal that *customer experience* or in Finnish *asiakaskokemus* has appeared in articles hundreds of times since 1999. Already in 2002, Kauppalehti (2002) wrote "Tens of years of Customer Experience", and in 1999 Taloussanomat's published an article about features affecting customer experience in a physical store (Hyvönen 1999). Articles often consider ways to understand and measure customer behaviour to manage business towards better fulfilling customer expectations. Indeed, understanding who your customers are is the start of satisfying their needs and desires for your organisation. Understanding your customer makes it possible to measure their activities and validate improvements. No industry field stands out from the review, and everybody shares a similar interest in measuring, validating and designing for a positive experience, increased well-being and happiness.

Considering customer experience is highly important for cities and the public sector. Our living environment is one of the most critical touchpoints for our well-being (Photo 1.). Urban touchpoints, such as transportation, policies and different infrastructures, require careful design to satisfy multiple perspectives and can be complex. Especially design approach can make healthcare more efficient, improve user-friendliness and increase caregivers' and patients' satisfaction (Altmann et al. 2019).

Picture 1. A confusing experience to select the suitable sanitiser or perception of over-caring in the airport's arrival terminal. (Picture: Markus Ahola)

If we look at academia, we can see that thousands of scientific publications are published annually containing experience or experiential keywords. Research is scattered across different disciplines: learning, gaming, technology, health & well-being, psychology, marketing and the study of working life. In fact, the research area of experience research does not exist, and research is scattered across 326 out of all 334 research fields classified in the Scopus database (Roto et al. 2021). Different research fields have their perspectives and approaches but share a common aim to develop our understanding

of experience phenomena. With a joint force, we can develop effective research methods and tools and get high-quality results.

Establishing a solid ground for experience expertise requires a multidisciplinary approach and seeking theoretical and methodological aids beyond our own expertise to understand better, measure and design for experiences. Finding relevant partners openly and collaborating across the disciplines will accelerate Finnish expertise in the growing field of experience research and practice. The LAB University of Applied Sciences has an outstanding possibility to act as a hub that unites different disciplines and industries to escalate the growth of experience ability in Finnish companies.

LAB's approach to customer experience

In the spring–winter of 2022, we rolled up our sleeves with the LAB customer experience platform's multidisciplinary team of 13 experts. The team has a background in business, technology, healthcare, and design and expertise fields from various perspectives. The work started with getting familiar with our expertise and defining how we further develop LAB's customer experience expertise. Together we envisioned building one of Finland's leading experimental and brave multidisciplinary customer experience hubs. The goal was set to provide innovative thinking, added value and be a flexible and trusted innovation partner for our stakeholders. A higher-level aim is to integrate an experience-driven mindset into LAB's RDI and education and supply exceptional customer experience for our partners. The long-term process will take place through (1) agile experimenting and industry collaboration, (2) growing our expertise, (3) innovation piloting and testing, (4) demanding innovation activities and (5) life-long learning. The expectations are set high, and the execution of a carefully made plan has only started, but we can already enjoy outstanding achievements. We have published numerous experience-related publications, extended the networks nationally and internationally and increased external funding. For example, customer experience is a central perspective in our development of the Mobile UX test centre, Artificial Intelligence for patient safety, company's customer experience maturity research and a research program on future living. To observe and contribute to the ever-evolving research field of experiences, LAB has joined as an organisational member of the Experience Research Society (EXPRESSO), fostering cross-disciplinary collaboration around experiences to create scientific and societal impact.

Experiences are important, topical and relevant for every business. Understanding your customer and designing for better experiences is a multidisciplinary approach that is difficult to master solo. Better communication, awareness and collaboration are needed between practitioners, research institutions and the public sector. LAB has organised its multidisciplinary muscles to help our partners stand out in customer experience, make the most out of customer data and educate future experience-minded talents.

Above all, customer experience is a mindset of thinking about the ultimate needs and desires of the people and fulfilling those with better solutions to increase well-being and happiness. The increasing complexity of our ecosystems needs a sociocultural and socio-technical environment that supports the transformation towards an experience-driven approach and the development of better tools for creating innovative solutions for the Finnish industry. LAB has established a Customer Experience Platform that calls on partners for collaboration to satisfy this need.

References

Ahola, M., Himberg, T., Ahola, P., & Vainio, T. 2021. Kohti yhteisöllisen tiedon rakentamista: Näkökulmia kokemuksen tutkimusmenetelmistä käsittelevän kurssin toteutuksesta Aalto-yliopistossa. Yliopistopedagogiikka, Vol. 28 (2). Cited 20 Jun 2022. Available at https://lehti.yliopistopedagogiikka.fi/2021/12/20/kohti-yhteisollisen-tiedon-rakentamista-nakokulmia-kokemuksen-tutkimusmenetelmia-kasittelevan-kurssin-toteutuksesta-aalto-yliopistossa/

Altman, M., Huang, T. T., & Breland, J. Y. 2018. Design thinking in health care. Preventing Chronic Disease. Vol. 15, 180128. Cited 20 Jun 2022. Available at http://dx.doi.org/10.5888/pcd15.180128

Kauppalehti. 2002. Kymmeniä vuosia asiakaskokemusta. Cited 20 Jun 2022. Available at: https://www.kauppalehti.fi/uutiset/kymmenia-vuosia-asiakaskokemusta/8287d3c1-0feb-3796-a94a-7c34218a6993

Roto, V., Bragge, J., Lu, Y., & Pacauskas, D. 2021. Mapping experience research across disciplines: who, where, when. Quality and User Experience. Vol. 6 (1), 1-26. Cited 20 Jun 2022. Available at https://doi.org/10.1007/s41233-021-00047-4

Hyvönen, P. 1999. Asiakaskokemus, mitä se on? Taloussanomat. Cited 20 Jun 2022. Available at: https://www.is.fi/taloussanomat/art-2000001307573.html

Katariina Pakarinen

Designing new models for lifelong education

Abstract

The two-year project, Continuation — Lifelong education and competence building, funded by the European Social Fund, develops needs-based continuing education for the Institute of Design at the LAB University of Applied Sciences. The project aims to form a comprehensive knowledge-renewing entity which helps companies, employees and job seekers update their professional skills and knowledge. The project focuses on finding out the needs of working life, anticipating future requirements and developing customer-oriented training models with the help of design thinking tools. This article describes how the project benchmarked continuing education offerings and working life needs as a basis for development work and how the first training pilots were tested and developed with customers during spring 2022.

Keywords: continuous education, competence development, design thinking, resilience, educational pilots

Designing new models for lifelong education

The Continuation project aims to increase employees' competence at personal and organisational levels while improving the sustainable development of the local business structure. The aim is to create efficient customer-oriented educational service packages based on authentic customer needs now and in the future. Modular training packages are developed in a way that they can be used to update the skills of employees in companies and organisations, as well as entrepreneurs and professionals outside of work, to meet the challenges of future working life. Educational modules are co-developed with the business field, design thinking tools and methods. Training packages are tested with customers in different product and service development areas through rapid experiments. (Pakarinen & Suokas 2021).

Future thinking is strongly present in the project's implementation, and future skills are anticipated through technological, informational and social requirements. Future thinking helps us prepare for upcoming

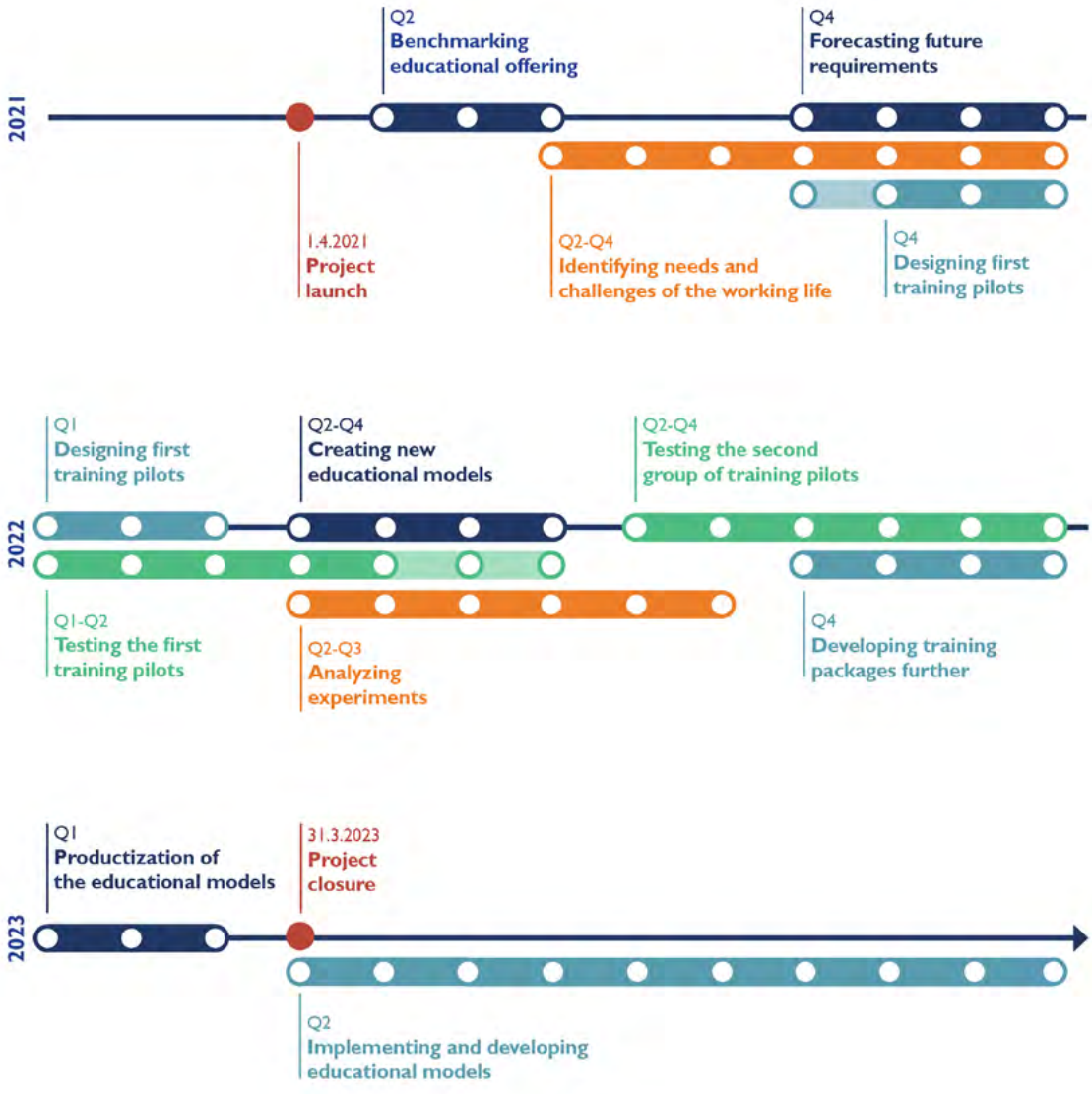


Figure 1. Timeline of the Continuation project (Pakarinen 2022)

scenarios so that the unknown future causes less uncertainty. It also allows us to point out our goals and make long-term plans accordingly. (Institute for the Future 2019). Emerging signals of future skills are gathered during the project from webinars, events, literature, TV shows and publications. The project team uses, for example, scenario work and trend analysis methods. As a result, a description of the professions' requirements is formed and utilised in developing the courses.

Benchmarking and identifying the needs of working life

At first, the project team wanted to form an overall picture of the field's continuing education offerings—which themes are currently offered the most, what is missing from the field and what new and improved continuing education could offer. The team focused on obtaining background information by benchmarking current educational themes, user needs, learners' aspirations and goals and prospective customers. Benchmarking helped to identify good practices, interesting approaches and emerging themes that could be used later in the project to design the most competitive, high-quality and forward-looking continuing education possible. At the same time, efforts were made to find superior competitive advantages and added value for the customer. The project team paid particular attention to educational themes, contents, combinations and practical arrangements in contact teaching and distance learning. At the same time, they examined what kind of customer groups would be preferable and most beneficial. The project team also looked at the accessibility and comprehensibility of information. The benchmarking also sought to identify themes for which the Institute of Design would have strong expertise. Benchmarking was carried out as individual work by experts. The information was recorded as images, texts and links and analysed based on key points, observations and specifics. (Pakarinen 2022).

After the benchmarking, the competence needs of employees, job seekers and companies in the Päijät-Häme area were mapped in June 2021 using an online survey. The goal was to find out what challenges employees and job seekers face in their work and what new skills they feel they need now and in the future. The survey was also used to collect information on how important the respondents consider developing their competence and desire for continuing education. The survey included 21 questions to identify the challenges. The survey was distributed, for example, through network operators in the Päijät-Häme region, TE services and social media. The survey was open in early June for two weeks, and 168 people responded. The respondents said that working or finding a new job is especially challenging now due to the constantly changing world, new problems and needs, demanding work field, and lack of resources and technical know-how. The respondents said they would need more skills, especially in information technology, systems and programs, communication and

marketing, sales work and customer service. Two themes were strongly emphasised in the skills needs of the future: digital skills and interaction skills. (Pakarinen 2022).

The survey results were expanded via interviews with stakeholders, company representatives and employees from different regional industries. The interviews were mainly conducted through Teams, and 23 people participated. Business and network representatives were asked to look at the challenges and competence needs in their own organisations and operating environments from a personal perspective. The perspective of the employees, on the other hand, was professional growth. The project advisory board members also looked at the competence needs more broadly from the perspective of the project's objectives and new training models. Fifteen themes

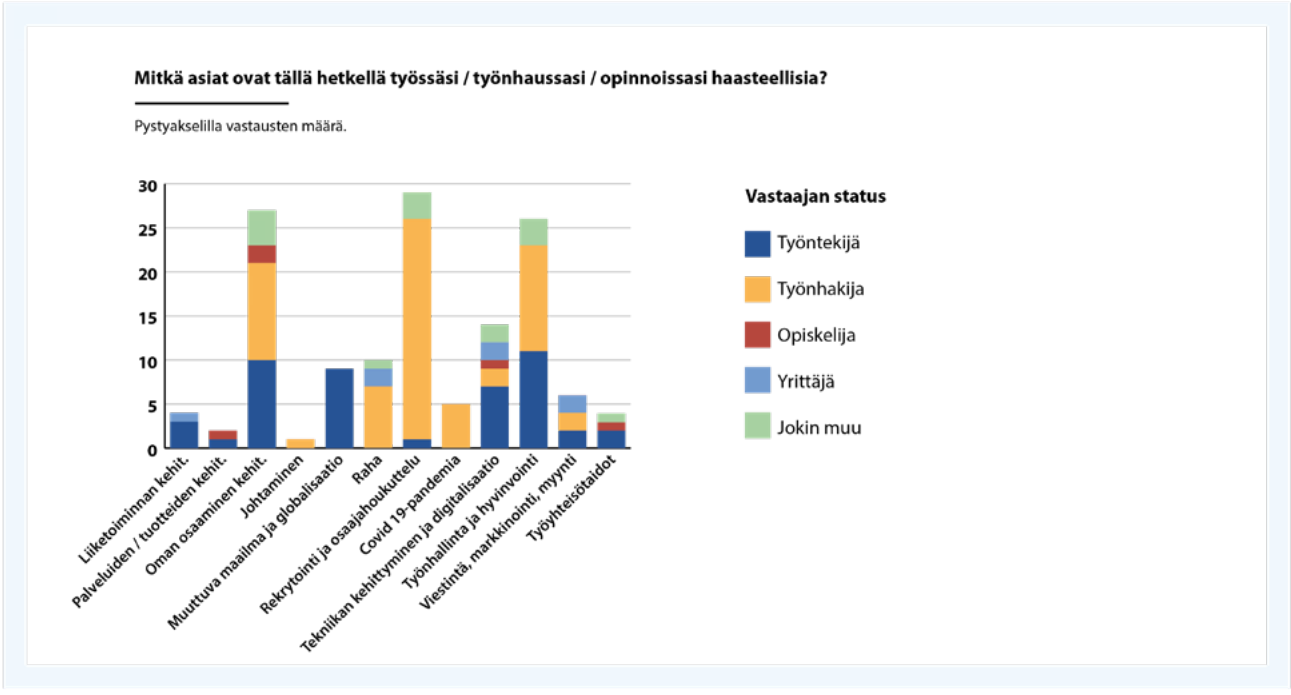


Figure 2. Description of the answers to the question: What is currently challenging in your work/job search/studies? The vertical axis shows the number of responses. (Pakarinen 2022)

emerged from the interviews, each containing several more specific headings: 1) a changing world and working life, 2) the COVID-19 pandemic, 3) the development of technology and digitisation, 4) sustainable development, 5) strategic business development, 6) money, 7) commercialisation of services and products, 8) communication, sales and marketing, 9) future competence and foresight, 10) recruitment and talent attraction, 11) customer understanding, 12) competence development, 13) work community and interaction skills, 14) work management and well-being at work and 15) management. (Pakarinen 2022).

To broaden the viewing angle even more, the team gathered the views and insights of the teaching staff at the Institute of Design with a survey (12 respondents) and interviews (5 interweaved). Strengthening pedagogical competence, mastering ICT skills and tools and facing challenging customer-student encounters emerged as the most important training desired.

Testing and developing educational models with customers

The themes mentioned above were used as a base for educational themes in the first training pilots, which were designed, tested and developed continuous education models with customers. Educational modules were tailored to meet the needs of employees, job seekers and the business community. The training content was based on background research and the latest knowledge, and it utilised design thinking, customer-oriented and user-oriented methods and service design.

During spring 2022, one customer event and three training pilots were held. The opportunity to participate in the training pilots was offered openly through the project's communication channels to the entire target group.

The first educational pilot was themed The morning of Future thinking and foresight. It was held online via Zoom in March 2022. Thirty-seven participants attended the training in addition to the project team. The pilot introduced future thinking and examples of emerging trends and signals. Participants also had an opportunity to try out a few foresight tools with the expert. The participants experienced the opportunity as an insightful, positive and inspiring experience that broadened their thinking. The new sources of foresight were praised, and some mentioned that they plan to follow the changes with completely fresh eyes in the future. (Nurminen 2022).

In April, a second educational pilot, Business Design Bootcamp, bought together 33 people to learn, network and ideate for two days. Business representatives, students and experts attended the Bootcamp. Common to all the participating companies was a solid desire to develop and innovate their own operations and services and take over their futures effectively. The content of the Business Design Bootcamp consisted of four expert speeches, workshops and a joint discussion. The themes of the speeches were future thinking, digital marketing,

Picture 1. (Photo collage) Participants described Business Design Bootcamp as an intense, inspiring, informative, idea-rich and joyful educational event. (Pictures: Katariina Pakarinen)

responsibility and customer orientation and customer experience. The topics were based on real customer needs mapped in project interviews and surveys. The newly learned skills were put into practice after the lectures in workshops. Each company had framed a development challenge for the Bootcamp in advance, and solutions to the challenge were sought together with service design students from the LAB University of Applied Sciences. Based on feedback, the representatives of the companies felt that the experts and students gave them new information and concrete tools to promote the measures. On the other hand, the students said they received confirmation of their professional identity. Genuine encounters, empowering interaction and impressive networking were appreciated by all who participated. (Pakarinen & Suokas 2022).

Between April and May, a third pilot, The Business Design PT coaching concept, was tested with the target group. The ensemble included five separate coaching sessions. The themes were: project management and performance-based work and well-being, customer-oriented service development and the customer's path in services, customer-oriented communication, marketing and information visualisation in support of communication, network collaboration and co-development and design, and resilience and creative methods of ideation. Representatives of eight companies, five experts from the JATKO team, and a project trainee participated in the coaching. The PT pilot responded concretely to the goal defined in the project plan to teach employees flexible adaptation to new professional requirements, the ability to co-develop and collaborate and new problem-solving skills. The coaching sessions included exercises during the coaching and homework that allowed participants to practice the themes and use tools independently. A comprehensive workbook was created for the participants from homework and other materials. In addition, the training group filled out a joint PT friendship book to encourage networking. (Tsokkinen 2022). Based on the open feedback, the PT coaching offered continuous positive pressure and methods for mutual networking. The training themes were considered interesting, and the joint work was praised. Along the way, changes and improvements were made to running the training days according to participant feedback. For example, the feedback illustrated the hope for a more general discussion in the first coaching session. To boost discourse, coaches added more time for conversation and creative group assignments.

Analysing results and redesigning subsequent training pilots

Qualitative and quantitative methods have been used to analyse the results of the training pilots. The analysis has been carried out by the project's own team of experts. In reviewing the results and feedback, special attention was paid to the success of the experiments, challenges encountered, areas for development and new themes. Based

Picture 2. (Photo collage) Coaching sessions were varied. For example, on day three, the group visited Ace Cafe to meet with a local entrepreneur Riku Routo to discuss the importance of marketing. Participants also built a wearable smart device from paper. On day four, the group assignments helped the participants notice that networking challenges are very similar regardless of industry and that solutions are often found faster together. (Pictures: Seesam Tsokkinen)

on the interviews, survey results, peer review and data collection, customer segments and personas were created—these help to plan and market pilot trainings in the right way for the right target group.

The analysis highlighted that training pilots have been topical and have responded well to the competence needs of the target group. Pilots have supported the development of intangible products and services through selected themes. The theme of sustainable development has been included in all trainings. Participants said they received new information and practical guidance on responsible customer-oriented product and service development. They have also been able to network and continue to share their own expertise. Accumulation of new knowledge has empowered participants and promoted their skills. The training pilots have also improved future working life skills and well-being. The pre-combined training themes have helped the participants to understand more broadly the competence needs related to developing their own competence. An example is the Bootcamp combo: customer understanding, marketing, responsibility and future thinking.

The project's approach has been effective since it considers the changing needs of the business community and tailors the in-service training accordingly through an iterative approach. The results already obtained will help to shape and develop the following pilots, future training offerings and in-service training model in a customer-oriented manner. Customer feedback and observations have guided the team to fine-tune upcoming educational pilots. For example, in autumn 2022, the upcoming *Strategic and systemic planning pilot* will respond directly to customers' needs to understand complicated systems more deeply. A pilot with the theme *Working life is changing—are you ready?* will help to understand the themes of future working life while building resilience, competence and happiness in a vastly changing world.

References

Institute for the Future. 2019. Ready, Set, Future! Introduction to Futures Thinking. Cited 3 Aug 2022. Available at https://www.coursera.org/learn/introduction-to-futures-thinking/home/welcome

Nurminen, P. 2022. Tulevaisuusajattelun ja ennakoinnin aamupäivä. LAB Focus. Cited 3 Aug 2022. Available at https://blogit.lab.fi/labfocus/tulevaisuusajattelun-ja-ennakoinnin-aamupaiva/

Pakarinen, K. & Suokas, M. 2021. Developing new models for lifelong education with customer-oriented mindset and methods. In Kristiina Soini-Salomaa (ed). LAB Design Annual Review 2021. Lahti: LAB University of Applied Sciences. The Publication Series of LAB University of Applied Sciences, part 35. 55-62. Cited 3 Aug 2022. Available at https://urn.fi/URN:ISBN:978-951-827-390-8

Pakarinen, K. & Suokas, M. 2022. Business Design Bootcampiltä uutta oppia kehittämiseen. LAB Focus. Cited 3 Aug 2022. https://blogit.lab.fi/labfocus/business-design-bootcampilta-uutta-oppia-kehittamiseen/

Pakarinen, K. 2022. Kohti uudistuvaa ja uudistavaa täydennyskoulutusta. LAB Pro. Cited 3 Aug 2022. Available at https://www.labopen.fi/lab-pro/kohti-uudistuvaa-ja-uudistavaa-taydennyskoulutusta/

Tsokkinen, S. 2022. Business Design PT -koulutus pilottivaiheessa. LAB Pro. Cited 15 Aug 2022. Available at https://www.labopen.fi/lab-pro/business-design-pt-koulutus-pilottivaiheessa/

Katariina Mäenpää

Universities developing further education to tackle the challenges of AI

Abstract

In Finland, we have a strong faith and long tradition in education. Currently, both traditional education as well as regeneration of knowledge and skills in practice are challenged by digitalisation. The project Leadership as a trigger for behavioural change when creating AI cultures in companies and organisations (LEADBEHA) has taken on the task by surveying the needs of companies and other organisations to develop new higher education according to the needs in the field. The purpose was to upgrade the content of existing master's degree programmes in six universities in Finland. The perspective of business was strongly emphasised. In this way, LEADBEHA has strived to develop a new, innovative, agile, and practically useful higher education offering. LEADBEHA has produced new knowledge of the companies' and other organisations' needs for flexible master's degree study units to maintain and improve the skill of their employees and respond to the challenges of the competitive environment. Also, experiences and knowledge about national-level collaboration between universities in producing an educational package for companies and organisations were reviewed. In brief, LEADBEHA contributes to the competitiveness of several fields of businesses in modern society. The article concentrates on the LAB Design Institute's contribution to the project.

Keywords: Digitalisation, Further education, Higher Education Institution collaboration, Systemic Thinking, Artificial intelligence

Description of the premises

Radical changes in operational environment and needs for competence caused by digitalisation were the root cause for the LEADBEHA project. To tackle the challenges of this multidimensional phenomenon, a consortium of multidisciplinary higher education institutions with enthusiasm to narrow the gap between the offering of higher education and the needs of companies

and working life decided to combine their existing international substantive areas of expertise. It was considered important that the members of the consortium already had strong cooperation with working life and companies in their respective regions. Particularly, the focus was on Artificial Intelligence (AI) and the elements of smart technologies that already permeate nearly all sectors of society, and hence affect almost every person's life currently and even increasingly in the future. Because of this, a technological approach alone was not enough, but an understanding of human behaviour and economics as well as requirements of organisational culture are also needed as these technologies continue to develop. Leadership, the systemic impact of solutions, and the management of change through them are crucial. During the project, a national network-like way of working was also born to refine high-level knowledge and skills into practical entities that meet the needs of companies.

In the consortium, the members were committed to update higher education and university pedagogy to better respond to the challenge brought by the upheaval caused by AI and digitisation. With the digitisation of society, solid technological knowledge and

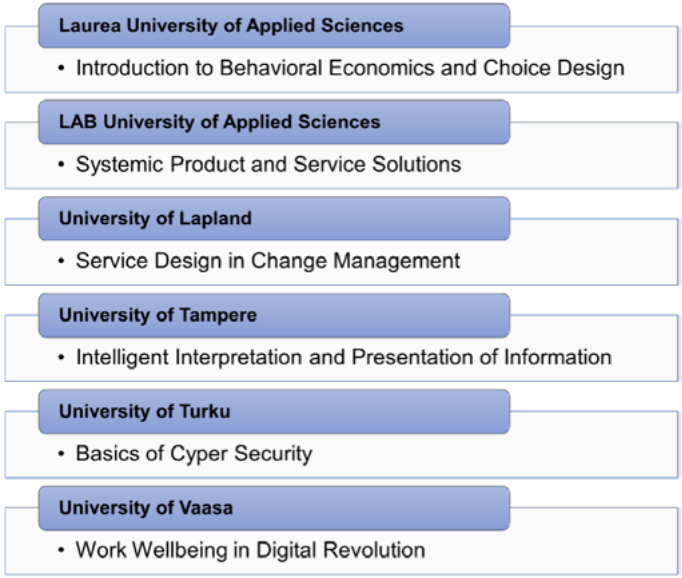


Figure 1. The project consortium and expertise areas (Figure: Katariina Mäenpää)

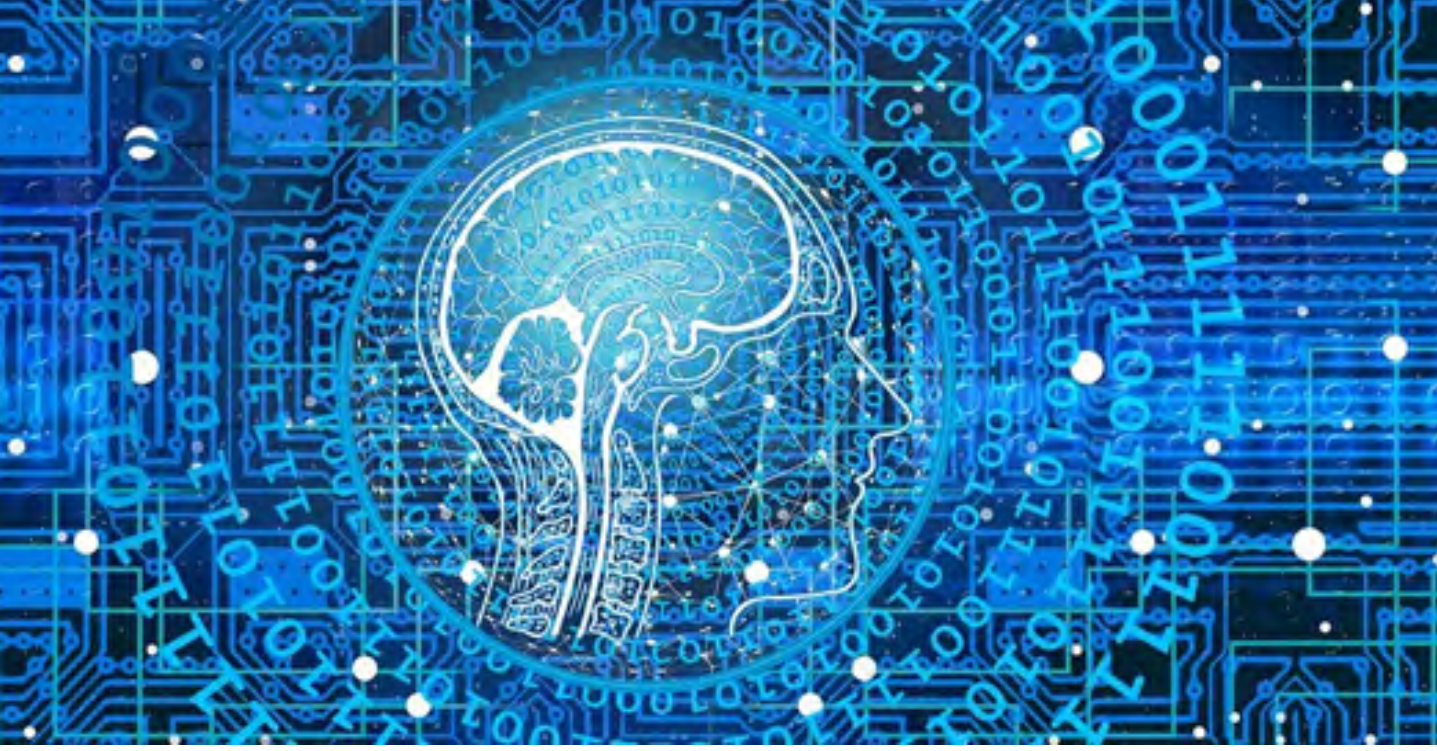
know-how are needed, but this is not enough. In addition, a deep understanding of human behaviour, economics, the design of products and services, and management are essential. Thus, the content of LEADBEHA had to reflect the diversity of the phenomenon. The concrete aim of the project was to develop an introductory course for professionals to digitised society and to accomplish this, each member of the consortium brought a study content of one-credit in scope of their expertise to the educational entity. The starting point was existing five-credit master's level courses, which were intended to be refined into one study entity.

Product and service solutions course in LAB Design Institute - background

People are fundamentally at the core of every complex system but are often completely ignored when designing the systems. For its part, digitalisation has opened up completely new dimensions for the development of products, services, and systems, but at the same time, there is a danger of alienating users with an overly technological approach. To understand the systems and enable a human user experience, it is good to combine the analytical tools of systems thinking with the creative ways of thinking of human-centred design, in which case complex challenges are easier to understand, the bottlenecks of operations are identified, the views of stakeholders are considered, and it is possible to create sustainable solutions.

The secret of every successful invention created in this world has been based on three characteristics: simplicity of use, usefulness, and versatility. The people-oriented approach carries great power thanks to usability, functionality, and experience. The idea of comprehensive usability shapes the human-centred design approach, which is a great driver for improving the user experience of user interfaces. Human-oriented design sets the basis of digital design on human characteristics. The "human first" principle means putting users first, because instead of designing interfaces where users adapt to the system, a human-oriented approach encourages designers to develop interfaces adapted to the needs of users. Designed with a human focus, the user interface is intuitive, user-friendly, and easy to learn, the possibility of making mistakes is minimised and ethical aspects are considered (Ambreen 2021).

Systems thinking is a comprehensive approach that needs to be connected to human-oriented design. Systems thinking differs from traditional analysis, which studies systems by dividing them into separate elements. In systems thinking, the system is viewed as a whole whose parts are interconnected and function over time in the context of larger systems. Systems thinking can be used in many areas of research, such as medicine, environment, politics, economics, human resources, and education systems, and according to it, the behaviour of a system arises because of the effects of reinforcing and balancing processes. The strengthening process leads to an increase in some component of the system, while



Picture 1. Digitalisation provides a limitless amount of application possibilities. (Chatterjee et al. 2018)

the balancing process tends to maintain balance in a certain system (Lutkevich 2020).

The all-encompassing system of data networks has given birth to the Internet of Things (IoT). The IoT connects objects through countless sensors and operating devices, offering the possibility to collect, share and analyse information to enable innovative applications (Gubbi et al. 2013). IoT enables interaction between many kinds of objects, such as home appliances, surveillance cameras, wearable devices, smartphones, industrial sensors, and vehicles, and it can facilitate the development of many new services for citizens, companies, and authorities. Connecting objects and the environment of the digital world means the possibility of developing new applications and services for different stakeholders.

IoT is not only about connecting sensing devices but also includes generating insights or knowledge from data that help solve a problem or automate a process without human intervention (Chatterjee et al. 2018). Thanks to the huge amount of data collected through connected IoT devices, AI algorithms and techniques can analyse the data and learn from them to create new and improve existing public services, in other words create value for users. The proliferation of artificial intelligence that offers advanced data analytics options greatly

improves the use of IoT, and reciprocally, by providing large amounts of data as input, IoT also enables the application of artificial intelligence in numerous different sectors (Tewari & Gupta 2020).

This jungle of possibilities created by technologies is therefore in dire need of professionals to research and develop useful and commercially viable products and services. Human-oriented design is the basis for a permanent competitive advantage and a way to reach a critical user mass - that's why it is necessary for a university of applied sciences to offer education that meets the demand for the competence needs of system thinking and human-oriented design, as well as the management of AI and IoT solutions.

Implementation of the course as a part of LEADBEHA

The future requires a new kind of education that responds to changes in competence needs. The LAB University of Applied Sciences course was selected for the LEADBEHA project as part of the LAB Design Institute's master's degree in culture. The studies are especially intended for design and media professionals and focus on user- and people-oriented, community-based (co-design) and experimental development, as well as planning and management of activities based on design thinking but containing research justifications (evidence-based). A trained design or media professional knows how to apply design thinking to the development processes and strategic planning of companies and organisations. He knows how to target professional expertise in the design or media industry in accordance with his own orientation in the themes of service design, information design, brand development, business and urban design, public sector and well-being development, and environmentally responsible design. The training enables professionals creative fields to find new career paths in the ever-changing realm of working life (LAB University of Applied Sciences 2021).

In the five-credit implementation of the systemic product and service solutions course, user-oriented design of product-service systems as part of business was discussed and practised. This included understanding user-oriented service design and practicing human-technology interaction planning in connection with IoT-type solutions. In terms of business organisation, the conceptualisation of systemic solutions and the assembly of the necessary operational networks were practised. To complete the course, the students were instructed to reserve 133 hours of work.

The learning goal of the course was to be able to recognise the benefits of the IoT for the company, for enhancing its current business operations and for new business operations, and for increasing the value of products and services. In addition, the student should have the skills to identify and evaluate the impact of the IoT on society, as well as evaluate the consumers' perspective on digitalisation through the generalisation of the concepts of the IoT and the IoT and systemic service solutions.

The systemic product and service solutions course was preceded by a preliminary assignment, the scope of which, including materials and tasks, required about 25 hours of work. In the preliminary task, the material on the smartservicedesign.com website was taught to students to familiarise them with the theme and to briefly evaluate the approach presented in the material to the development of services that apply artificial intelligence, to consider the difference between services that apply artificial intelligence and IoT solutions, and to come up with at least 10 functional application areas where IoT solutions could be viable. As additional reading, the trends of data analytics in 2021 were presented, along with the application possibilities of Big Data, the applications of IoT, among others, articles created in the retail and health care sectors.

The actual teaching started with a preliminary task in group workshops of user-oriented service design and IoT solutions. The concepts related to the theme were opened to ensure a common understanding - user orientation and user experience were the most important - the differences between user experience and usability were emphasised, and the user experience and usability solutions used in industry in the context of complex systems were introduced through practical examples. A peek into systemic thinking and homework in groups of three were also presented during the first meeting. In the group work, the task was to identify the phenomena and megatrends that will influence people's behaviour in the future, and thereby guide the demand for IoT solutions and business development. Ideas had to be mirrored in articles dealing with the latest IoT innovations and their competitive advantages compared to other similar solutions had to be analysed. The observations and results had to be compiled into a PowerPoint presentation, which was presented at the next lesson.

On the second day of systemic solution planning, the process, and methods of developing IoT solutions were introduced. When selecting the method, the nature of the information needed in terms of the set goal was emphasised as a factor guiding the selection of the method, the use of work templates in the analysis of the effects of consumer trends was practiced, the necessary factors in preparing a design strategy were considered, as well as the structure, parts, and goals of the design process. In connection with the day, a description of the conceptualisation of a systemic product and service, the importance of customer understanding, and the stages of conceptualisation were reviewed. The personal development task created as the result of the study course was carried forward by means of joint planning. Overall, among the designer's methods, the tools, and methods of service design were important tools of systemic design, which were gathered to cover the second day. The skills of joint planning are generally seen as very important skills that can be applied in working life, which are practiced to a considerable extent during the master’s studies.

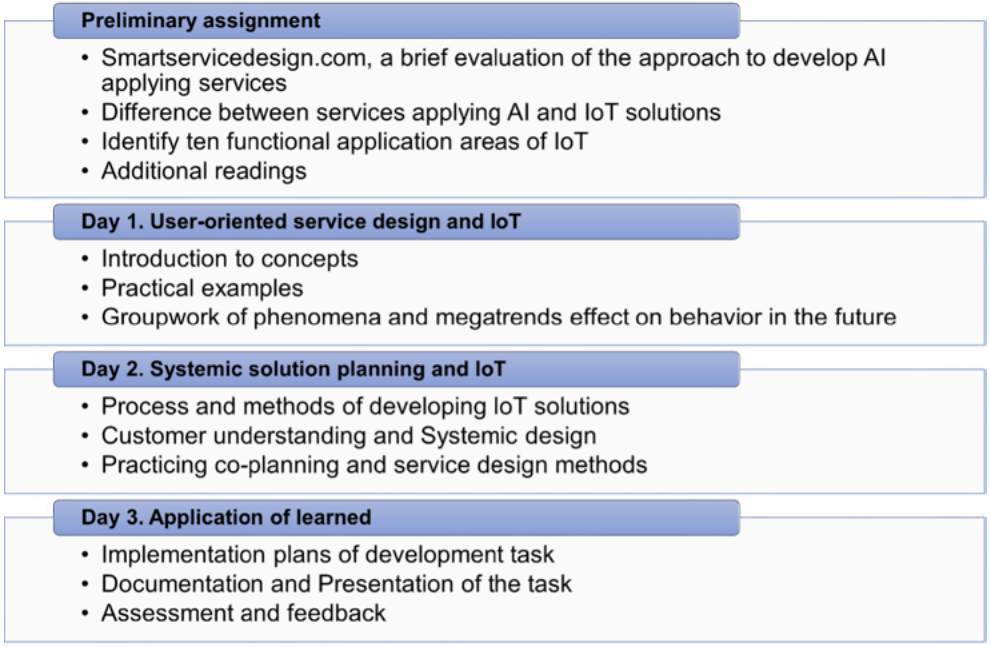


Figure 2. Structure of the course (Figure: Katariina Mäenpää)

On the third day, the focus was on the practical application of the tools presented in previous sessions, the implementation plans of the participants' development tasks were worked on in groups, and a plan for documenting the development of the task and presenting the results was drawn up for each participant, suitable for each of their goals. Since the course included practical co-planning work and its supervision, participation in face-to-face teaching days were necessary. The assessment of the Systemic Product and Service Solutions course was based on a preliminary assignment, active participation in the exercises of different modes of innovation activity in groups, independent application of the development perspectives and their methods that have been reviewed and practised during the course, and an exercise assignment targeting one's own development task. Of these, the first two made up half of the grade and the third task the rest of the grade.

The Systemic Product and Service Solutions course began on April 7th and ended on June 12th, and students who started their master's studies in the fall of 2020 participated in it. The marketing of the studies was basically the responsibility of the communication service of LAB University of Applied Sciences

and LUT University, naturally regarding the entire degree programme without focusing on this specific course. On behalf of the project, the course was marketed at various company meetings and events as well as on social media channels. At the same time, the needs of companies regarding the development of education were also investigated. A total of 12 students participated, which was significantly less than the previous year, when 26 students completed the master's course. Basically, students were in working life, willing to update their own skills and represented a wide range of industries, although the emphasis lies somewhat on companies with a design background. Feedback on the course from students was not available when the article was being prepared.

Findings of the implementation

The goal of the LEADBEHA project was to map the educational needs related to the AI cultures in companies and working life, to prepare – based on the feedback – master's degree courses that open the theme, and to pilot these course units as supplementary further education for company and working life personnel. The purpose was to produce an operating model that meets the current needs of companies and organisations in accordance with the challenges of working life. In this way, a concrete benefit of the further education related to change management and competence development would meet the needs of companies.

In the project, the LAB Design Institute piloted the systemic product and service solutions study unit, which was a part of the master's degree, and thus, a total of 12 students completed the course implementation in question. When the purpose was to try out the study course separately for representatives of companies and working life as its own entity, a sufficient number of students could not be gathered. The reasons for this were discussed among the partial implementer's own project group, and the result was to limit and reorient the content of the study unit to make the implementation clearer and more focused. It was concluded that systemic thinking could appear too abstract a concept in the form of a single course without the supporting broader content of the master's programme, which in part would introduce the theme and prepare the students to comprehend more challenging conceptual phenomena.

On the other hand, marketing was also perceived as a challenge, because articulating and opening an abstract theme in terms of practical benefits was perceived to be difficult, and thus, the targeted target group could not be convinced of the usefulness of the course in relation to the time spent and work effort. These experiences underlined the pain points of course aimed at companies and working life: the efficiency ratio must be balanced, the content must be unquestionably relevant in terms of the job description and the critical competence of the industry, and the content must be written in a target group-oriented manner. Marketing communications must bring concrete, practically immediately realised benefits as well

as the investment required by training in an unambiguous and clear way - otherwise the investment decision to increase competence will remain on shaky ground and will not be made until then.

In the future, the demand for the efficiency of education will be met by increasing the number of self-directed studies, as freedom from time and place seems to be important for those studying while working. This is understandable, since the appreciation of free time is growing all the time and the working days themselves are often very busy, which makes it difficult to fit the fixed times required by face-to-face teaching into the working day or everyday life in other ways. The preparatory task for the course seemed to work perfectly as an orientation to the future, and correspondingly, the personal development task to be prepared independently summed up what was learned in the course well, because its preparation effectively showed the student's learning and summed up the skill of applying what was learned in practice. It will be challenging to develop the teaching of joint design skills in a digital environment, because in the current implementation, most of the face-to-face teaching was seen as necessary to hone these skills.

It is necessary to analyse what has been implemented, correct mistakes and further develop a dialogue between representatives of working life and those who decide on the implementation of continuing education, because the failure of the actual pilot group may partly indicate a failure to map the needs of companies, both in terms of the content of the education and its communication. Since the group could not be gathered, it is necessary to make a thorough survey of the reasons for the failure and to carry out corrective actions in the planning to make the actual training experiment a success.

References

Ambreen, A. 2021. Human-centered design approach: Designing interfaces that enhance experience. Cited 1 April 2022. Available at https://uxplanet.org/human-centered-design-approach-designing-interfaces-that-enhance-experience-a1c1dcef17b8

Chatterjee, S., Kumar, A. & Gupta, M.P. 2018. Success of IoT in smart cities in India: An empirical analysis. Government Infomation Quaterly. Vol. 35(3), 349-361. Cited 2 Nov 2022. Available at https://doi.org/10.1016/j.giq.2018.05.002

Gubbi, J., Buyya, R., Marusic, S. & Palaniswami, M. 2013. Internet of Things (IoT): A vision, architectural elements, and future directions. Future Generation Computer Systems, 29(7), 1645–1660. Cited 2 Nov 2022. Available at https://doi.org/10.1016/j.future.2013.01.010

LAB University of Applied Sciences. 2021. Kulttuuriala (ylempi AMK), muotoiluajattelu ja muotoilujohtaminen, Lahti, 60 op. Uusia urapolkuja luovan alan ammattilaisille. Cited 1 Apr 2022. Available at https://www.lab.fi/fi/koulutus/kultuuriala-ylempi-amk-muotiluajattelu-ja-muotilujohtaminen-lahti-60-op

Lutkevich, B. 2020. Systems thinking. Definition. TechTarget. Cited 14 Feb 2022. Available at https://www.techtarget.com/searchcio/definition/systems-thinking

Tewari, A. & Gupta, B.B. 2020. Security, privacy, and trust of different layers in Internet-of-Things (IoTs) framework. Future Generation Computer Systems. Vol. 108 (July), 909-920. Cited 1 Apr 2022. Available at https://doi.org/10.1016/j.future.2018.04.027

Katariina Mäenpää

PARK explores gamification as a trigger for development and change

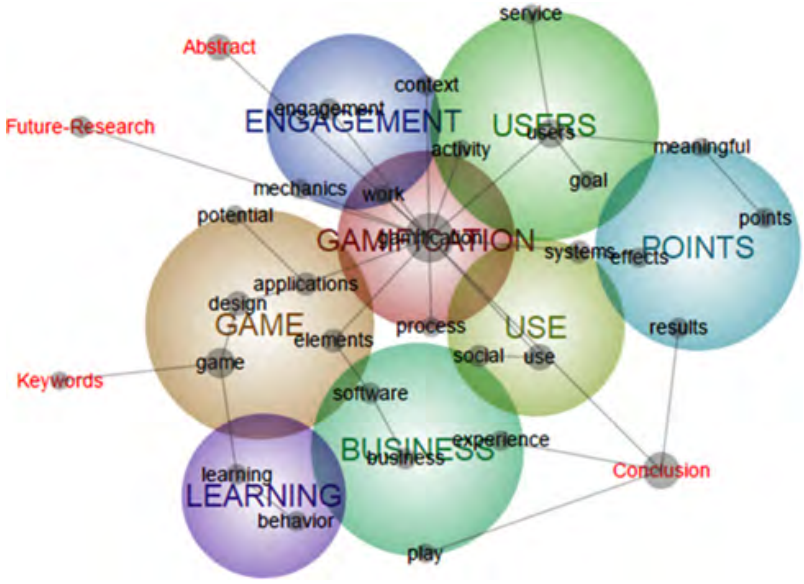
Abstract

The success of the digital and global gaming industry has arisen from the ability to develop new businesses, mindsets, development methods and organisational cultures, which have continued effectively throughout the coronavirus crisis and contribute to sustainable development. Gamification is the essence of the gaming industry, and it means bringing elements, principles and features familiar from games to other industries and to situations where they are not usually present. The logic of the gamification motivates and rewards in ways that can bring about a fundamental change in behaviour. The PARK project selected the highlights from the gaming industry to share them at a common table. The project utilised the growth potential, development methods, and the technical and service-related innovations of the gaming industry, as well as gamification itself, to develop other industries and pandemic-resilient education in order bring about continuing behavioural change.

Keywords: Gamification, Higher Education Organisation Collaboration, Regional Development, Sustainability

Purpose of the project

Agility is a characteristic of the gaming industry that becomes crucial when unforeseen changes in the operational environment occur. The PARK (gaming industry leading towards pandemic-resilient education) project was implemented between 1 March 2021 and 31 August 2022 and was targeted at small and medium-sized companies (SMEs), although students, as well as educational and municipal organisations were also essential elements. The project was implemented by Southeast Finland (XAMK), Kajaani (KAMK), Jyväskylä (Jamk) and Lahti (LAB) universities of applied sciences. The goal of the project was to improve companies' capabilities to react to unexpected changes in the operating environment, as well as to develop the ability



Picture 1. Conceptual map of gamification (Rodrigues, Oliveira, Rodrigues 2019)

of educational organisations to respond to rapidly emerging needs. The idea was to select well-proven operating models and practices from the gaming industry and gaming technologies, and apply them to other industries, especially in the creative, tourism and event sectors, which have suffered from the COVID-19 pandemic and the restrictions it caused. By utilising these models and practices, the companies were able to develop pandemic-resilient services and to find new ideas to develop their own businesses.

Gamification is a multidimensional concept that can be utilised in various contexts for different purposes (Rodrigues, Oliveira, Rodrigues 2019). The objectives of the PARK project were to increase the resilience to the pandemic, the utilisation of pandemic-resilient business opportunities and the understanding of organisational challenges caused by the pandemic. In addition, there was an aim to increase the amount of company investment in RDI activities. The project also strived to intensify educational cooperation between universities of applied sciences and different fields of education, as well as innovative collaboration between different business sectors. Finally, the project was expected to enhance the resilience of education to pandemic and pandemic-like conditions and

the regional effectiveness of universities of applied sciences through business cooperation. In particular, with creative skills being a specific area of this project, the use of creative skills was integrated into various growth and restructuring sectors, educational institutions and the public sector, in order to improve the opportunities for the workforce in creative sectors to earn from their own work.

In the PARK project, there was an aim to improve the quality and relevance of education by matching the needs of working life and internationalisation to the competence of professionals in creative fields and teachers in the sector. There was also a goal to bring about new business among actors in the creative fields at the interface of art, science, technology, as well as various intangible value creation production and in cooperation with other growth and structural change industries. Creative skills were sought to be applied in new ways in the development, management and innovation activities of working life in different fields.

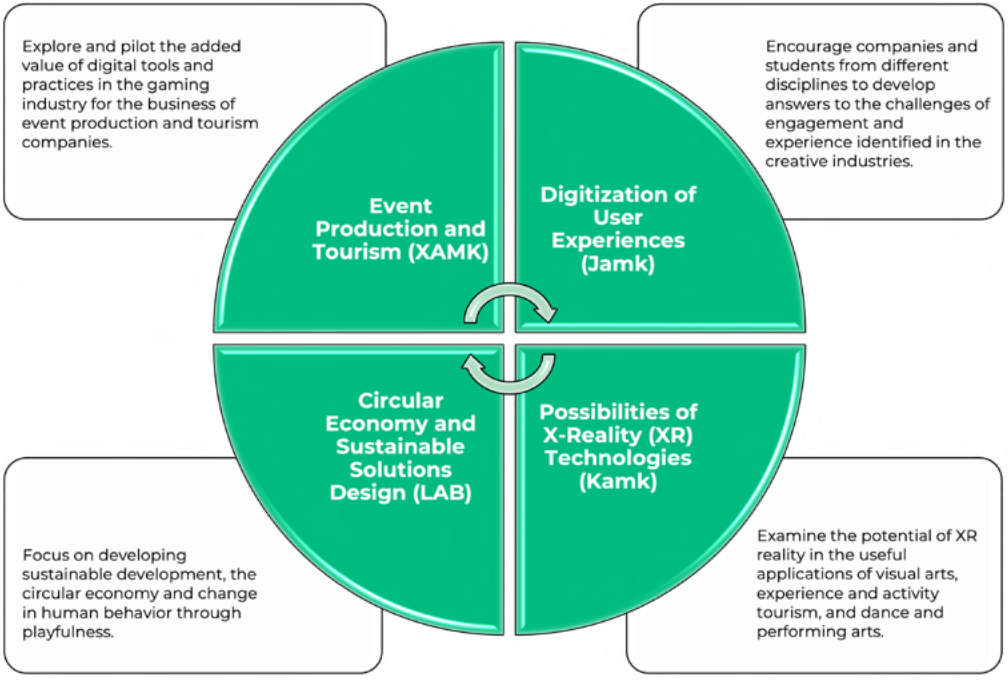


Figure 1. Themes and measures of the PARK project (Figure: Katariina Mäenpää)

Also, there was a desire for the advisory and support systems of the creative economy and expertise to be developed in order to strengthen the expertise and professionalism in the field.

The aim of the project was to produce the methodological know-how of a decentralised innovation process and product development familiar from gaming processes for non-gaming sectors, which are characterised by more traditional ways of operating. This model of decentralised co-development is also applied to the development of educational collaboration between universities.

The core of the project consisted of multidisciplinary innovation workshops utilising service design methods, which addressed the challenges of companies and public organisations to develop a pandemic-resistant approach.

Implementing a design sprint at the LAB Design Institute

In the PARK project, the task of the LAB Design Institute was to bring together the region's strategically important circular economy and related actors, as well as experts in the creative fields who are interested in the gaming industry, utilise gamification, and are involved in game development. The purpose was to arouse interest in the possibilities of gamification and to plant seeds of cooperation between these operators. These experts in the creative fields were entrepreneurs and freelancers in the gaming industry and were closely related to the gaming industry, as well as active hobbyists and game developers, especially members of IGDA (International Game Developers Association) Finland. Cooperation was also planned through the business networks of LADEC (Lahti Regional Development) and, for example, the expertise of housing professionals. Students and lecturers were also essential elements in the activity.

The idea of emphasising the circular economy was natural: It was one of the top themes of smart specialisation recorded in the Päijät-Häme regional strategy, together with design, sport, and experiences. In addition, in 2021 Lahti was the European Environmental Capital, which means that the interface with the circular economy and sustainable development was obvious (Kivelä 2021, Green Lahti 2021). According to the regional strategy, directing regional RDI expertise to the growth and development of companies and the creation of new regional business activities based on the cooperation of actors in the region served as the basis for the project. At the same time, efforts were made to build bridges between the circular economy and other areas of smart specialisation, especially experiences and design. The situation was considered to require new, bold business development solutions from companies in the region, which can be helped by the know-how of creative fields and the utilisation of gamification.

Due to COVID-19, contacting companies and getting them involved turned out to be more challenging than expected, and in the autumn a decision was made to focus on attracting participants to develop their own

activities in line with sustainable development. The idea was that the positive experiences of gamification and the combination of development measures would motivate the participants to continue cooperating in the follow-up project, and at the same time, the development tasks developed in the design sprint would provide the materials for the content of new projects – this concept worked and a total of seven companies with their own development tasks were brought along, as well as four company representatives to spar with the teams working on the development tasks. One of the latter was a one-woman company with a YAMK degree providing guide services, two were companies developing and producing digital services, and the fourth was a gaming industry participant representing IGDA ry. The table below gathers together the participants and their development tasks.

The actual design sprint was preceded by an orientation day organised on 12 October that introduced gamification and the principles of sustainable development. Lectures were given by Lecturer Antti Heinonen from the LAB Design Institute concentrating on gamification, and the representative of Planet Centric Design, Anton Schubert from Vincit Oy, on sustainable design. After

Kuutio Galleria	How to inspire hairdresser to collect hair and hair fibres for further processing? hiukkahyva.fi/
Lindström Oy	How to get employees to take care of the required level oh hygiene in workwear? lindstromgroup.com/fi//tyovaatteet/
Painovoima ry	How to motivate outdoor enthusiasts to take care of the environment on the Lehmusreitti? lahdenseudunluonto.fi/lehmusreitti
Purkupiha Oy	How to improve workers' safety at work? purkupiha.fi/
SenioriSolu Kodit	How to inspire seniors to move around in a familiar environment? seniorisolukodit.fi/
Validia	How to encourage customers to stay calm in queuing / waiting situations? validia.fi
Wau Sensei	How to engage players in the Wau Sensei character game? Wausensei.fi

Figure 2. Participating firms and their development tasks (Figure: Katariina Mäenpää)

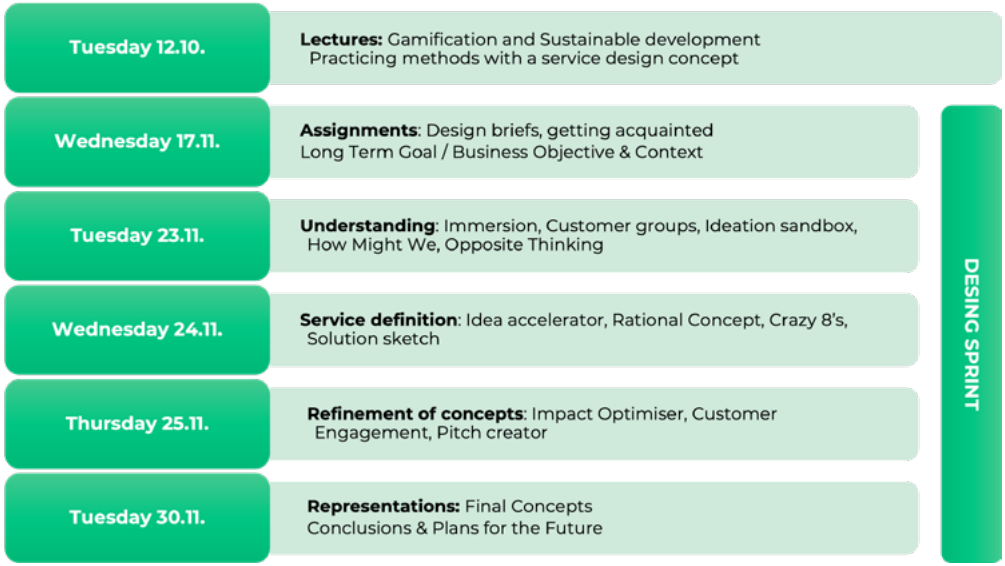


Figure 3. Schedule and content of the project implementation (Figure: Katariina Mäenpää)

the lectures, participants were divided into virtual breakout rooms to practise the service design methods presented during the morning. A total of 45 students participated in the event.

The design sprint started on Wednesday 17 November, and it was carried out in a compact way over a period of three weeks, with a total of five active days in the latter half of November. A description of the sprint is presented below.

Initially, the ambitious aim was to run the whole process on site at the campus, but eventually we had to give in to a hybrid implementation and Zoom was used for guidance, while teamwork was run using Microsoft Teams. In addition to these, the teams made use of Miro and the communication channel of their choice. Although the official design sprint is a method developed by Google in 2010 for the implementation of complex development tasks (Knapp and Zeratsky 2022), we also used templates from Futurice's Lean Service Creation (LSC) method (Futurice 2021) and the Board of Innovation's Ideation Workshops (IW) method (Board of Innovation 2021).

The work started on a Wednesday by grouping the teams and presenting the development tasks (i.e. design briefs), after which sleeves were rolled up and each team started to tackled its assignments by using the Business Objectives & Context canvas (LSC). As a homework assignment for the

Tuesday of the following week, the teams were instructed to look for inspiring benchmarks and familiarise themselves with the theme of the development task in more detail. The next time, we focused on identifying the problem and brainstorming possible solutions. During the morning, Futurice's Immersion, Customer Groups and Ideation Sandbox templates (LSC) helped, while in the afternoon the participants worked with Board of Innovation's How Might We and Opposite Thinking templates (IW), which challenged the teams to think about not-so-obvious options and to question ideas that had already been formed.

The design sprint got its name specifically from the fast-working rhythm, which aims to get effective solutions on time. Therefore, the next day we dived deeper into the review of ideas and used LSC's Idea Accelerator and Rational Concept templates, until a point in the afternoon when we started sketching the solution concept in terms of service definition (Crazy 8's, Solution Sketch, IW). After all, everyone knows that it's good to strike while the iron is hot, and that's why the work continued at a good pace on Thursday morning by going through the generated concepts, which were examined with the support of LSC's Impact Optimizer and Customer Engagement templates. After lunch, the afternoon was reserved for finalising the concept for the final presentation using the Pitch Creator template. We had already reached the final straight, which appropriately ends with crossing the finish line. This happened on Wednesday of the following week, when all seven groups presented their final results. Due to illnesses and overlapping study units, a total of 14 students participated in this event.

At the end of the last day of the design sprint, each participant had the opportunity to give their feedback in a Figma-based four-field, where they enquired about things they liked, what they had learnt, and what was missing. The respondents seemed to have been mainly students, although the opportunity to answer was also offered to representatives of companies. Thanks were given to the companies' stimulating development tasks and the participation of company representatives, practical work, teamwork, and variation in remote working. Lessons had been learnt from working with companies, facilitation practices and new working methods (including work templates) and defining the problem. Challenges were experienced in the technical implementation (connections did not work, Zoom crashed completely, and those who used remote programs less had problems finding the right place and the right documents), but of course the limited opportunities of the organiser to prepare for everything were recognised. More orientation, theory and reasoning, customer orientation and communication in general were needed. More close working would have been desired, as well as more detailed information about the selected work templates and justifications for why certain work templates were chosen.

After the sprint, the project manager held a mutual summary meeting with the other two experts who were responsible for the

design sprint implementation. Allocating more time to the preparation of the design sprint would have been good, but due to the other responsibilities of the experts the best possible performance was achieved with the available resources. Commonality between the companies and their development tasks would have made the implementation easier, but when recruiting companies there was no opportunity to select only certain development tasks: the companies were given instructions in advance for planning the development tasks, but there seemed to be challenges in locking them in for some companies.

Final remarks

A feedback survey was sent to the representatives of the companies after the design launch, but unfortunately no responses were received. The comments received by e-mail and in informal discussions praised the great progress of the projects and the engaged activity of the teams. A company representative sent their thanks by email: *'I think the sprint well quite well; it was a bit more effort on my side than I initially expected, but indeed I can see the positive impact of the invested time on the final results, with which I am very happy. To sum up, it was a very positive experience and I think the team did a great job.'* Based on this comment, we have kept in touch with all the participants during the spring of 2022 – naturally more closely with some than with others – and it would seem that the majority are willing to continue the project cooperation.

As a result of the workshops, the participating companies' own development toolkit grew with the gamification mindset and methods. At the same time, concrete ideas emerged for businesses, as well as new concepts for product and service innovations. Participants also networked with each other and created new innovative ways of working, from which new joint ventures might be expected. Also, cross-sectoral practical cooperation increased between students and employers and businesses. This contributes in the long run to student employment and potential entrepreneurship after graduation through better work life skills and contacts.

The project developed models for cooperation between higher education and R&D, which were piloted by implementing project workshop activities between participating universities. In the future, the results can be utilised in the further planning of project activities, study courses and workshops. In addition to the workshops, new project ideas were created for cooperation between creative industries and other fields, based on which it will be possible to build project applications in the coming funding period.

References

Board of Innovation. 2021. Ideation workshop guide. Cited 5 May 2022. Available at: https://www.boardofinnovation.com/guides/ideation-guide/

Futurice. 2021. Lean Service Creation. Cited 5 May 2022. Available at: https://futurice.com/lean-service-creation

Green Lahti. 2021. Lahti – European Environmental Capital 2021. Cited 5 May 2022. Available at: https://greenlahti.fi/

Google. 20 Design Sprint Methodology. Cited 5 May 2022. Available at: https://designsprint-kit.withgoogle.com/methodology/overview

Knapp, J. & Zeratsky, J. 2022. The Design Sprint. Cited 5 May 2022. Available at: https://www.thesprintbook.com/the-design-sprint

Kivelä, R. (toim). 2021. Älykäs erikoistuminen ja tiekartat. Maakuntastrategiassa 2018–2021 esitettyjen kärkien ja tiekarttahankkeiden yhteenveto. Päijät-Hämeen liitto. Cited 5 May 2022. Available at https://paijat-hame.fi/wp-content/uploads/2021/04/Alykas_erikoistuminen_ja_tiekartat_190421.pdf

Rodrigues, L.F., Oliveira, A. & Rodrigues, H. 2019. Main gamification concepts: A systematic mapping study. Heliyon 5. Cited 10 October 2022. Available at: https://www.sciencedirect.com/science/article/pii/S240584401935618X#fig3

Aino Vepsäläinen

Design for Sustainable Business growth platform

Abstract

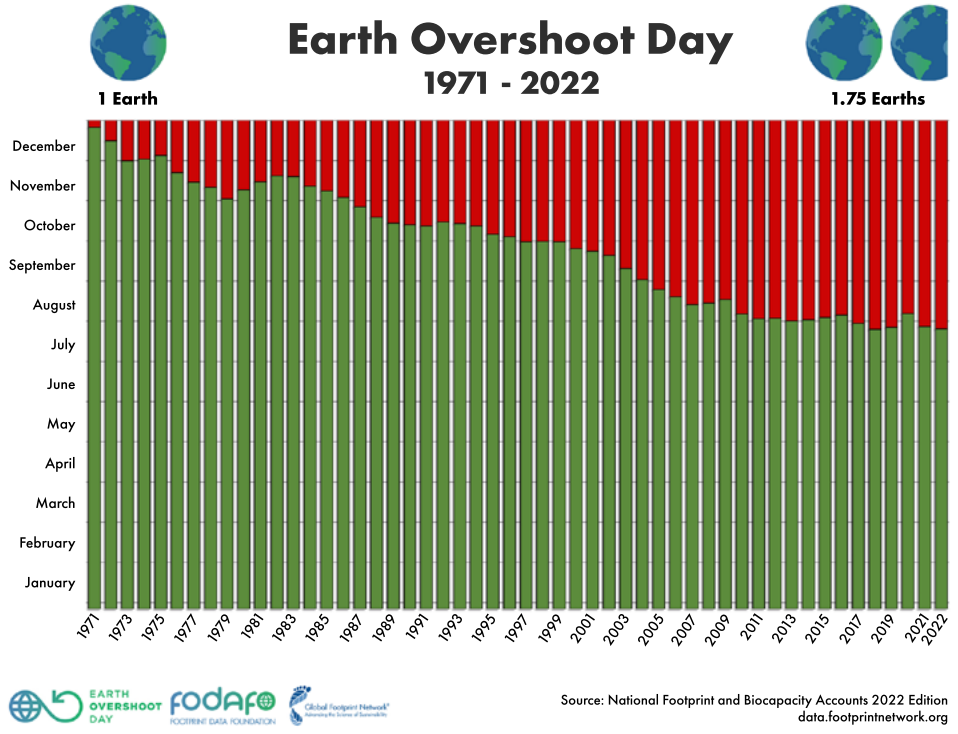
The need for sustainable solutions is undeniable and they are needed more than ever. The consequences of climate change create global challenges that affect everyone regardless of geographic location or nationality. The effects have a significant impact not only on the environment but also on social and economic levels. The Design for Sustainable Business platform at the Institute of Art and Design at LAB University of Applied Sciences focuses on the role of design in the current operating environment and meets future needs by utilising design. The platform targets the opportunities of sustainability and circularity with an emphasis on our ecological and living environment.

Keywords: circular economy, circular design, sustainable design, sustainable business, design thinking

The role of design in sustainable development

The current use of natural resources and the impacts of overconsumption are environmentally unsustainable both locally in Finland and globally. The Earth´s ecological carrying capacity is being exceeded at an alarming level. Globally, the world's overshoot day was in August, which means that we would need almost two earths to produce the natural resources we use. Finns used their share of the Earth's annually renewable natural resources even earlier in 2022 – Finland's overshoot day was 31 March. If everyone on Earth consumed like us, we would need almost four earths to produce the natural resources used. But we only have one planet, and together we must find ways to ensure that it provides us with well-being in the future too (National Footprint and Biocapacity Accounts 2022a).

Positively, new skills and the development of technology, among other developments, support the transition towards sustainability. And fortunately, our society and companies have already realised the importance of sustainable and responsible solutions for their business and for the environment.



Picture 1. Earth Overshoot Day (National Footprint and Biocapacity Accounts 2022b)

It has been estimated that 80% of a product's environmental impacts are defined in the design phase (Ellen McArthur Foundation). Design offers ways to preserve value, both in terms of product design and the entire service process. Design as a method provides solutions for circularity and sustainability with its ability for problem solving. This is related to a solution-oriented mindset and a participatory operations model that combines empathic understanding, creative ideating and experimental development, which are all typical for a design process (Tikka & Gävert 2018, 135).

The circular economy aims to reduce the overuse of natural resources and restrain climate change, and thus also affects the preservation and increase in biodiversity. In a circular economy, the value of materials and products is kept as high as possible for as long as possible. When products are designed to be high-quality, durable and easy to repair, they are also long lasting and the value remains high in the product at the

same time. As a result of the products and materials staying in circulation for as long as possible, it also increases the creation of added value and more efficient and economical use of raw materials.

The expectations of sustainability among consumers

Future consumers expect more sustainable and environmentally responsible products from companies. A recent international report by Alice Labs discovered what kinds of expectations people place on their relationship with physical products. Various design opportunities emerged in the research. The common factors of these opportunities are consumers' more critical attitudes towards overconsumption and the use of depleted natural resources (Greene & Korkman 2022, 4).

The report presents four new areas of opportunity that have the potential for design and innovation. 'Useful Stuff' brings out the fact that the longevity of goods is significantly important for consumers in different markets. The growing interest in the longevity of goods supports the special nature of design related to functionality and usability to increase the usefulness of products in the long term. 'Joyful Stuff' describes consumers' efforts to satisfy their longing for novelty by acquiring new and innovative products without feeling guilty. 'Stuff Linked to Nature' presents people's growing desire to find products that are less harmful to nature. These products could even regenerate nature and communities. 'Flowing Stuff' highlights consumers' growing expectations that goods should 'flow' smoothly from one owner to another and from one purpose to another. Consumers expect physical materials and goods in future to move forwards and see themselves as temporary owners and users (Greene & Korkman 2022, 4).

According to the report, the factor that connects the four possibilities is that rather than just looking at the products, we should focus on the products in a wider context: where, what, how and by whom they are made? How they are used and how they are disposed of? (Greene & Korkman 2022, 41)

As the study of Greene & Korkman shows, design not only provides solutions for the product's life cycle, usability and value retention – it also takes into account aesthetics, joy and purpose. Understanding the motivation and needs of the future customer makes it possible to create holistic value and benefit for them. With these perspectives the solutions and products for more sustainable everyday life can be provided.

Design is becoming more and more important right now

Awareness of the climate emergency and the loss of biodiversity is significantly increasing. Despite this fact, the business world has not yet taken significant steps to change its course towards sustainability. The problem is not in the research and knowledge or the will, but as long as we face challenges at the systemic level, we are not able to produce strategic solutions that have an impact on the whole business, the value chains of companies and entire ecosystems. Design alone

does not solve this systemic challenge, but it can offer specific, good and useful tools for multidisciplinary collaboration. This is what we strive for at LAB University of Applied Sciences with the help of the Design for Sustainable Business platform.

Fortunately, the time of transition that we are living through right now is favourable for the implementation of design and the development of the design industry in pursuit of sustainability. This can be seen, for example, in the fact that decision-makers have recently taken into account the importance of design in building a more sustainable and circular Europe.

The Finnish Government adopted a resolution on promoting a circular economy in April 2021. Finland's vision with measures and targeted results is that Finland will be a carbon-neutral circular economy society by 2035. According to the resolution, the consumption of non-renewable natural resources will decrease and the sustainable use of renewable natural resources will increase significantly. Resource productivity must also double from 2015 levels by 2035. In addition, according to the resolution, the circular economy of materials should double by 2035 (Finnish Government, 2021). The initiative also recognises design as enabler of the circular economy in Finland, and related actions have already been taken. A national Circular Design programme for Finnish companies developed by several stakeholders has kicked off. The Circular Design programme is globally unique, being the first national circular economy programme with a design focus (Kiertotalous-Suomi 2022).

Global goals have also been set to solve the challenges that have arisen as a result of climate change. The European Green Deal is a package of policy initiatives that aims to set the EU on the path to a green transition, with the ultimate goal of reaching climate neutrality by 2050. These objectives affect the future business of all actors (European Council 2019).

Industry and manufacturers are some of the biggest producers of the global carbon footprint. But attention should not only focus there – brand owners, product developers and designers are responsible for the resources and materials used and have a crucial role in contributing to and influencing overconsumption and consumer behaviour. In order to support sustainable product design and manufacturing, the European Commission published an initiative in March 2022 that aims to ensure that by 2030, a significant share of products on the EU market are designed to be more sustainable, more energy and resource efficient, more repairable and recyclable, and preferably also made from recycled materials (European Commission 2022a).

The New European Bauhaus forwarding the European Green Deal

In addition to the proposals launched March 2022, a progressive initiative, The New European Bauhaus, was started by the Commission in 2021. The New European Bauhaus takes into account the importance of design at the European level and involves people

Picture 2. The New European Bauhaus Festival in Brussels, June 2022 (Picture: Aino Vepsäläinen)

and organisations, including educational institutions. The New European Bauhaus is an environmental, economic and cultural project aiming to combine design, sustainability, accessibility, affordability and investment in order to help deliver the European Green Deal (European Union 2021).

In June 2022, the Commission organised a festival dedicated to the New European Bauhaus for the first time. The festival showcased the power of European networks and brought together people from all over Europe, including leading decision-makers, to debate and shape a beautiful, sustainable and inclusive future (European Commission 2022b).

During the festival, the European Regions Research and Innovation Network (ERRIN) organised EU Design Days in Brussels, to which LAB University of Applied Sciences was invited, and the Design for Sustainable Business growth platform was introduced. Design and creativity stakeholders and practitioners from all parts of Europe gathered at the EU Design Days event. The event consisted of speeches, discussions and workshops.

Aino Vepsäläinen, Chief Specialist of the Design for Sustainable Business platform, spoke in the event as a presentative of LAB University of Applied Sciences and took part in a panel discussion with a topic 'New models of policy and governance'. The goal of the Design Days was not just to reflect on the challenges of implementing the Green Deal and foster sustainability through design and creativity, but also to collectively identify solutions, learn from each other and build synergies between different international practitioners (ERRIN 2022).

As the examples above show, the Finnish authorities and the Commission have defined several important policy instruments and measures. These policies as well as the activities in the European networks significantly support the transition towards sustainable development through design and, alongside this, offer opportunities to develop capabilities and activities in sustainable design at LAB University of Applied Sciences. Participating in these networks and initiatives creates value for the Design for Sustainable Business growth platform in many ways.

Picture 3. EU Design Days in Brussels, June 2022 (ERRIN 2022)

Learning from other European stakeholders deepens our own expertise and at the same time we are able to offer others the knowledge and solutions we have built and created. This supports our own networks and future opportunities in terms of the development of collaboration and expertise

Strengthening sustainable and circular design expertise at LAB

LAB University of Applied Sciences strengthens its competence with its strategy on many levels. Fourteen growth platforms have been established to build multidisciplinary capabilities and ways to collaborate between disciplines. The platforms also aim to create excellence in four focus areas in the fields of design, circular economy, well-being and innovation. The platform of Design for Sustainable Business started its activities this year, 2022. The purpose is to deepen the competence of sustainable design in education, research, development and innovation, as well as to build up collaboration with working life.

Global changes affect all areas of sustainable development, directly or indirectly. Several challenges, even crises, have been faced in many different areas, many of which are related to loss of nature and climate change. Changes in the operating environment also change the need for design, thus the discipline of design has to transform and develop. Design for Sustainable Business platform focuses on environmental sustainability and how responsible design can be used to produce new and more sustainable solutions.

The Design for Sustainable Business platform focuses on the applications of sustainable design in:

1. Solutions and models based on life cycle thinking (repairability, modularity, modifiability, reusability, recyclability, longevity)
2. Solutions for new sustainable material innovations
3. Solutions utilising new technologies
4. Influencing consumption and behaviour towards sustainability
5. Increasing the capability and competence of companies and designers

Building purpose with design

Despite upheaval and growing global challenges, at LAB University of Applied Sciences we already have lots of experience and the abilities to solve them. Even though the Design for Sustainable Business platform only started its activities this year, our work has strong roots. Design education in Lahti started over 50 years ago and has been highly valued over the decades. The institute has been developing itself along with changes in the operating environment. One of the biggest assets of our time is the ability to combine different skills. For this development of multidisciplinary, the operation of the platforms provides a basis. The Design for Sustainable Business platform gathers together the work that is currently being done at LAB University of Applied Sciences and further develops the themes that support the utilisation of design in companies

and organisations. The work done at LAB aims to produce genuine value for individuals, companies, society and the planet. As the above-mentioned national Circular Design programme shows, we are pioneers in both design and the circular economy here in Finland. By combining these skills, we can create a new type of value for both companies and society.

When looking back at what has been done in the area of sustainable design in recent years at LAB University of Applied Sciences, it can be stated that a significant number of sustainable development and circular design projects have been carried out.

The basis for sustainable development is to understand the environment and business climate in which we are operating. The tools for this are foresight thinking together with design methods. Currently the 'Combining foresight thinking to product development' project (EKY) at LAB is supporting this development (LAB University of Applied Sciences 2021a).

Life cycle thinking is the starting point for circular design, and the trailblazing project 'Long Life and Recyclability Through Product Design' (KISU) is where the tools for circular design were crystallised and a guide published. KISU's results are far-reaching and support many other projects (LAB University of Applied Sciences 2021b).

From the material resource perspective, there is a huge need for substitutes for fossil materials. A great initiative in this field is 'Hiukka 2.0' project. The aim of the project is to study possibilities of organic fibers in replacing plastic-based materials and improve the understanding and knowledge of the actors in the region about business in accordance with the principles of the circular economy. In Hiukka 2.0, hair fibres are researched and solutions and best uses for hair fibres are sought. (LAB University of Applied Sciences 2021c)

The 'Coaching for responsible and effective product and service development' project (VPK) is focusing on developing companies' expertise in environmentally responsible product and service development to enable companies to meet the demand for environmental responsibility for product and service solutions emerging from the customer interface (LAB University of Applied Sciences 2022).

Another current topic related to the megatrend of ageing populations is housing solutions for older people that is researched and developed in the 'Sustainable Service Housing Ecosystem' project (KEKO). New growth and business potential can be discovered by developing and piloting novel solutions and technologies relating to smart and sustainable living and housing – in this case, senior service housing and its solutions regarding interior design, safety, health and communication (LAB University of Applied Sciences 2021d).

In addition to these past and ongoing projects, we have implemented several other projects related to sustainable and circular design that support us to develop new content and grow expertise.

Transition towards sustainability has kicked off

Although a lot has already been done, there are still plenty of challenges to tackle. Climate change doesn't 'pause' while we are developing a better world. This means that at the same time as we are creating new tools and new solutions we need to act, there is no time to waste and we are globally late with the actions. However, the unpleasant consequences that we are already experiencing as a result of climate change are accelerating the change. It is now easier for a wider group of citizens and professionals in different fields to understand why now is the time to take action, when extreme natural phenomena strain our economy and hinder our free time, for example in the form of drought or extreme rain.

The COVID-19 pandemic and the war in Ukraine have also shown for people what it means when raw materials are not available and prices rise. These changes make the effects of diminishing materials and natural resources concrete as the effects of climate change grow. For this reason, the circulation of materials and the preservation of the value of goods as high as possible in circulation become relevant and significant to everyone.

Design plays a vital role here, and we at LAB University of Applied Sciences have the opportunity and obligation to develop, iterate, test and pilot. As an educator, innovator and developer, LAB is a place for experiments and development. We are an actor that should bring sustainable design to the core of the business of organisations and companies to ensure a better and sustainable future. As part of the next steps, we need to expand our activities from simply minimising harmful effects to making a positive impact through regenerative design.

References

Finnish Government. 2021. Finland's Circular Economy Programme sets targets to curb overconsumption of natural resources. Cited 10 Sept 2022. Available at https://valtioneuvosto.fi/en/-/1410903/circular-economy-programme-sets-targets-to-curb-overconsumption-of-natural-resources

Ellen MacArthur Foundation. Recycling and the circular economy: what's the difference? Cited 3 Sept 2022. Available at https://ellenmacarthurfoundation.org/articles/recycling-and-the-circular-economy-whats-the-difference

European Commission. 2022a. Green Deal: New proposals to make sustainable products the norm and boost Europe's resource independence. Cited 3 Sept 2022. Available at https://ec.europa.eu/commission/presscorner/detail/en/ip_22_2013

European Commission. 2022b. First-ever New European Bauhaus Festival starts today in Brussels and around Europe. Cited 12 Sept 2022. Available at https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3486

European Council. 2019. European Green Deal. Cited 3 Sept 2022. Available at https://www.consilium.europa.eu/en/policies/green-deal/

European Union. New European Bauhaus. Cited 3 Sept 2022. Available at https://new-european-bauhaus.europa.eu/about_en

ERRIN. 2022. EU Design Days 2022. Cited 3 Sept 2022. Available at https://errin.eu/eu-design-days

Greene, S. & Korkman, O. 2022. The Stuff People Want – A New Horizon for Design in Finland. Design Forum Finland. Cited 10 Sept 2022. Available at https://www.designforum.fi/app/uploads/2022/05/The-Stuff-People-Want_A-New-Horizon-for-Design-in-Finland.pdf

Kiertotalous-Suomi. 2022. Circular Design – kehityspolku kohti kiertotaloutta. Cited 4 Oct 2022. Available at https://kiertotaloussuomi.fi/aineisto/circular-design-kehityspolku-kohti-kiertotaloutta/

National Footprint and Biocapacity Accounts. 2022a. Country Overshoot Days. Cited 3 Sept

2022. Available at https://www.overshootday.org/newsroom/country-overshoot-days/

National Footprint and Biocapacity Accounts. 2022b. Earth Overshoot Day. Country Overshoot Days. Cited 3 Sept 2022. Available at https://www.overshootday.org/newsroom/visuals/

LAB University of Applied Sciences. 2021a. Combining foresight thinking to product development. Cited 4 Oct 2022. Available at https://www.lab.fi/en/project/ennakointiosaamisen-kehittaminen-pk-yrityksissa

LAB University of Applied Sciences. 2021b. Kiertotalouden mukaisessa suunnittelussa muotoilija huomioi tuotteen koko elinkaaren. Cited 4 Oct 2022. Available at https://lab.fi/en/node/10479

LAB University of Applied Sciences. 2021c. HIUKKA 2.0 - Hius- ja muu orgaaninen kuitu muovin korvaajana. Cited 4 Oct 2022. Available at https://lab.fi/en/project/hiukka-20-hius-ja-muu-orgaaninen-kuitu-muovin-korvaajana

LAB University of Applied Sciences. 2021d. Sustainable Service Housing Ecosystem. Cited 4 Oct 2022. Available at https://www.lab.fi/en/project/sustainable-service-housing-ecosystem

LAB University of Applied Sciences. 2022. Coaching for responsible and effective product and service development. Cited 4 Oct 2022. Available at https://lab.fi/en/project/coaching-responsible-and-effective-product-and-service-development

Tikka, V. & Gävert, N. 2018. Designin uusi aalto. Helsinki: Kustannusosakeyhtiö Siltala.

Mirja Kälviäinen, Anna Palokangas, Kati Kumpulainen
& Enna Eloranta

Developing customer-driven sustainable business

Abstract

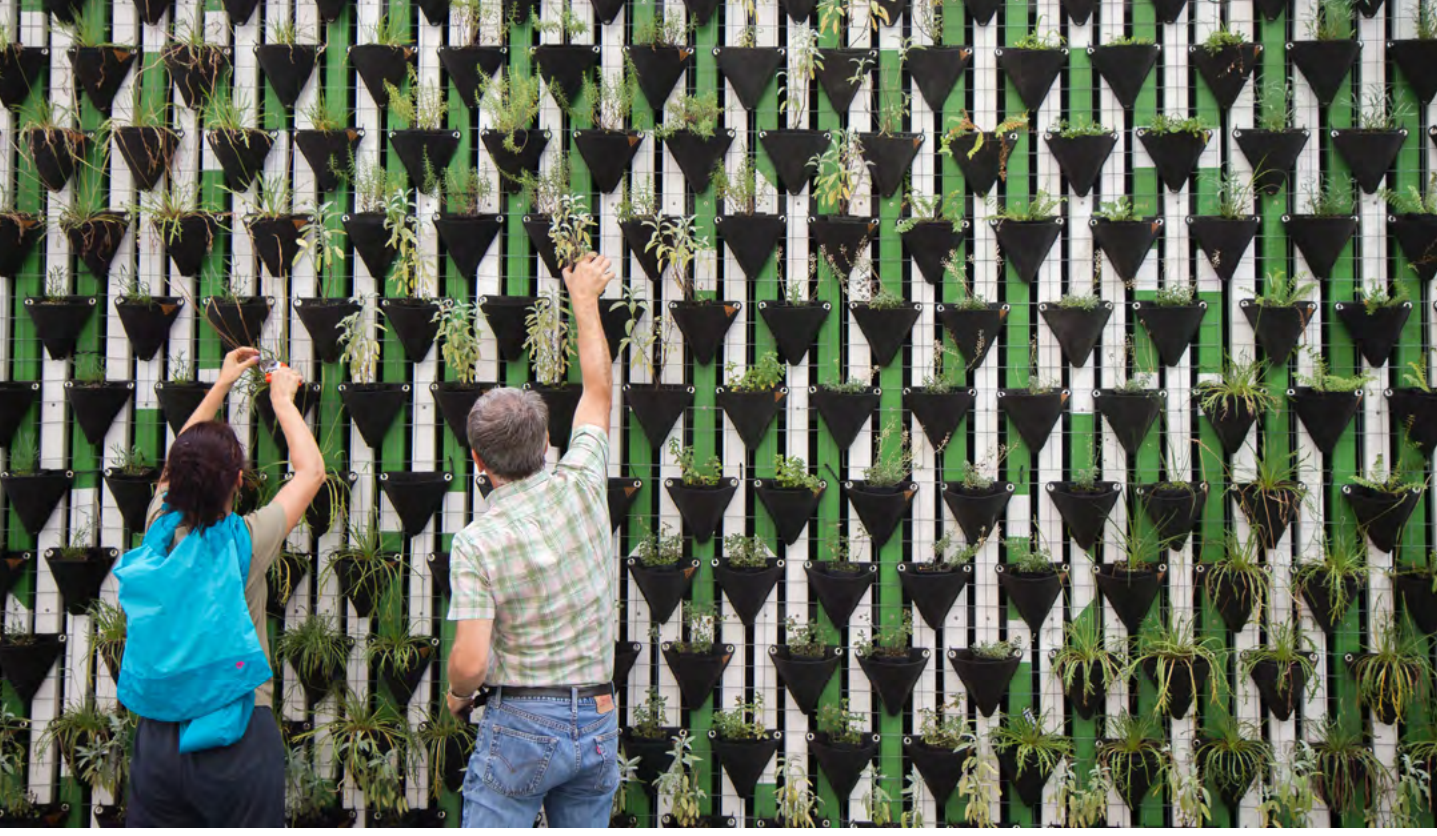
The requirements for corporate environmental responsibility have increased. In addition to reducing the carbon footprint associated with companies' operations, they now also cover the requirements of increasing their carbon handprint, which means lowering the environmental impact in the use of their offerings. Both the VPK and VPKE projects aim to promote and support this environmentally responsible, customer-orientated product and service development in small and medium-sized companies as an answer to the societal demand and customer trend for these kinds of double-responsibility business solutions. The support for companies is provided by training them in customer-driven design and in the development of environmentally responsible products and service solutions that help customers lower their environmental harm. The training includes steps also of communicating about their solutions efficiently. The support applies visual modelling of the double responsibility based on the companies' existing resources and, at the end, providing a MOOC-type online course for the companies to explore the materials by themselves.

Keywords: business responsibility, environmental responsibility, sustainable consumption, behaviour change, carbon handprint

Introduction

The development of environmental business responsibility has become an urgent focus of economic development, as the threats of climate change, drastic decline in biodiversity and resource scarcity are clearly visible. The most important factor affecting the future is responding to the ecological sustainability crisis, which requires reforming economic operation models (Lettenmeier et al. 2019, 4–5).

In order to mitigate climate change, consumption patterns must change significantly in countries that function according to Western consumption patterns (Lettenmeier et al. 2019, 4–5). Companies and their



Picture 1. Building a sustainable future requires both companies and consumers. (Funes 2017)

offerings play an essential role in bringing about this change. Consumers have woken up, and trends are changing in an environmentally responsible direction—consumers' expectations about customer-oriented alternatives to sustainable consumption have increased.

Environmental business responsibility must therefore be directed towards supporting the change in consumption and developing internal environmental responsibility or environmental responsibility in supply chains. The VPK and VPKE projects develop training for responsible service and product solution design at the LAB University of Applied Sciences, aiming to help companies with customer-oriented environmental responsibility by utilising design thinking and service design. The projects' results for customer-oriented environmental responsibility are provided as a MOOC (Massive Open Online Course) implementation.

Based on the information gathered in the initial interviews, benchmarks and the selected companies' operational analyses, the project has developed double and triple-loop models to facilitate the analysis and development of customer-oriented

environmental business responsibility. The models help to understand how and at what stages the company's services and products can help customers with environmentally responsible behaviours.

VPK + VPKE taking action

The VPK and VPKE projects aim to promote environmentally responsible product and service development in small and medium-sized companies so that they can react to the demand for such customer-driven solutions as a rising trend. Individual customers expect companies to support their changing desires for low-impact consumption and provide products and services based on their sustainability values. At the same time, a parallel development of pressure on environmental responsibility requirements can also be seen in the B2B segment.

The Coaching for responsible and effective product and service development (VPK) project was implemented in the Päijät-Häme area at the beginning of 2022. The project started by examining national and international product and service development solutions that support customers' environmentally responsible activities. The interaction methods for engaging and supporting customers from the perspective of environmentally responsible consumption were assessed. Related training and MOOC online material were planned to improve regional environmental expertise and competitiveness.

Due to the topic's relevancy, in August 2022, the Anticipating responsible service and product development (VPKE) project started as a sister activity to reach out to companies in the South Karelian area. It began by assembling a peer learning group for the purpose of co-creating a pre-training for companies to map their present

Picture 2. Responding to the crisis of ecological sustainability requires the renewal of economic operating models, for example, the sharing economy. (Pop & Zebra 2019)

situation and help them plan their next steps for customer-driven development of environmental responsibility. The South Karelian companies are piloting MOOC-based training, ensuring it is suitable for the target group, small and medium-sized companies. The role and benefits of the peer learning group combined with MOOC-based training are also under observation through the VPKE project.

The need for companies and consumers to act together

Mitigating climate change requires radical changes, especially in Western consumption patterns. Calculations of staying within the 1.5-degree global temperature rise indicate that the environmental impacts of consumption in Finland should be reduced by 70% by 2030 and even 90% by 2050 (Lettenmeier et al. 2019, 4–5). Companies and their products and services are essential in bringing about the necessary change.

The daily consumption of residential households causes around 70% of Western CO2 emissions. Consumption can be steered in the low-carbon direction by reducing the use of living space, heating, energy, electricity and water, switching to more ecological energy solutions, using low-impact means of mobility, avoiding high-carbon food choices and food waste and reducing the purchase of goods (Salo & Nissinen 2017, 14–22). Significant findings in consumer research are consumers' positive attitudes towards acting environmentally responsibly, but there is still a lack of responsible actions (White & Habib 2018, 9).

The importance of customer experience has dramatically increased as a means of market competition. Customer values and attitudes influence consumption decisions, and consumer demands towards corporate responsibility are growing both in Finland

Picture 3. Consumption can be steered in a lower carbon direction by companies and consumers switching to more ecological solutions. (Spiske 2020)

and internationally. Several of the latest trend forecasts at the beginning of 2022 indicate related consumption flows (Euromonitor International 2022; Accenture Interactive 2022, 17). The global change in product relationships is illustrated by Stuff in Flux 2 research, which highlights the already discernible shift of the consumer perspective from the satisfaction of needs and desires to an adequacy-based way of consuming (Greene & Korkman 2022).

The gap between consumers' environmentally positive attitudes and not-so-responsible behaviour is influenced by the various motivational consumer interests, pressures of busy daily life, emotional decision-making and individual capabilities. Information about environmental business responsibility and responsible business solutions is contradictory, confusing and difficult to find and understand. (Kälviäinen 2022, 145–201; Kuluttajaliitto 2022). Consumers need support and help seamlessly integrated into their daily lives to reduce their environmental impact. (Kälviäinen 2022, 209–211).

It is therefore justified to use interaction methods that increase understanding of the factors affecting customers' consumption behaviours and purchasing decisions since this brings opportunities and insight to companies to support customers in making environmentally responsible choices. Furthermore, customer-oriented product and service design methods can identify factors that motivate change and produce solutions promoting environmentally responsible actions. The product or operating environment may contain verbal and visual information to choose a low-impact environmental way of acting. The user can also be supported with feedback, rewards, penalties or reducing options only to the most environmentally favourable choices. A low-impact approach can also be built through design into the product as a script, directing consumers to a low-impact way of using it. (Kälviäinen 2022, 6, 21–23).

Since most Western consumers are concerned with environmental issues, but in practice, they cannot change their consumption habits, the companies should be interested in conducting customer studies to clarify which obstacles deter consumers from implementing their good intentions and what could help them do this. Development activities such as product design and service design can produce solutions aimed at overcoming obstacles and utilising interests as long as these factors are known, and there is a rich understanding of them. (Kälviäinen 2022, 6). The development potential from user orientation is applicable both for commercial producers desiring to offer environmentally responsible products and service systems and the public sector, which, for environmental reasons, should promote the change in consumer activities in an ecologically sustainable direction.

Field research notes

The VPK project examined the current state and needs of environmental responsibility and customer orientation in companies in the Päijät-Häme region by interviewing 17 company representatives. It proved

challenging for small and medium-sized enterprises to have enough know-how, resources, and information to design, implement and maintain environmentally responsible activities. It is unclear what are the most reasonable or profitable solutions for each company regarding environmental responsibility. From the corporate point of view, solutions that increase the company's competitiveness, provide an opportunity to stand out amongst competitors and achieve greater success in competitive markets are considered profitable and worthwhile, even in environmental responsibility.

In the companies, it was challenging to identify all the solutions that can be counted as environmentally responsible. However, if solutions were identified, communication about them was weak or nonexistent. This was evident for every company studied. Communicating about environmental actions was also challenged by the doubt that small environmental actions are not significant enough. The significance of the environmental action was also doubted if the measure seemed general, such as choosing renewable electricity. Social media channels were seen as a low-threshold way to communicate about environmental responsibility. Companies are also afraid to communicate about environmental responsibility if there is no information about the environmental responsibility of subcontracted products or services. For example, when it comes to materials, it may even be impossible to be entirely sure about the primary production of the material and the related responsibility. Communicating about environmentally responsible actions was identified in the companies as one area needing development.

The interviews revealed that some companies are afraid of greenwashing when communicating about the environment, so they avoid addressing the subject. The ever-expanding amount of marketing communications highlighting the ecological benefits of various products has made consumers wonder what to believe. The continuity of the company's activities and its parallelism with its presumed ecological products seem to play a significant role in building credibility. If there is inconsistency and even a hint of deception, it will considerably impact credibility, willingness to buy and the company's reputation. In consumer information, there are findings of doubts regarding the motivation of companies to go green and the extent to which their products truly represent their ecological benefits. (Gleim et al. 2013, 47–48; Kälviäinen 2022, 137–139).

According to the VPK interviews, the concept of customer orientation was perceived quite narrowly in the companies studied. Several company representatives mentioned that feedback surveys were conducted or they had received feedback concerning customer encounters. However, deep customer understanding was lacking or customers were not really involved in developing products or services.

The VPK Loops for business analysis

The VPK project has benchmarked companies and organisations that provide

customer-oriented, environmentally responsible solutions and analysed these actors' business models and product and service solutions. The project has also benchmarked business models made for describing sustainable business. The study showed that there are few business models based on customer-oriented environmental responsibility that SMEs could directly utilise.

By using the collected data, the project has analysed and developed a double-loop model for companies to use (Figure 1). It describes the actions of the company and the customer in parallel. It makes it easier for the company to see how environmental responsibility can be shifted from a business-oriented approach to a customer-oriented approach. On the right side, the model takes into account serving the company's customers and solution users, the possibilities of the company's solutions to reduce the customer's environmental impact, and the creation

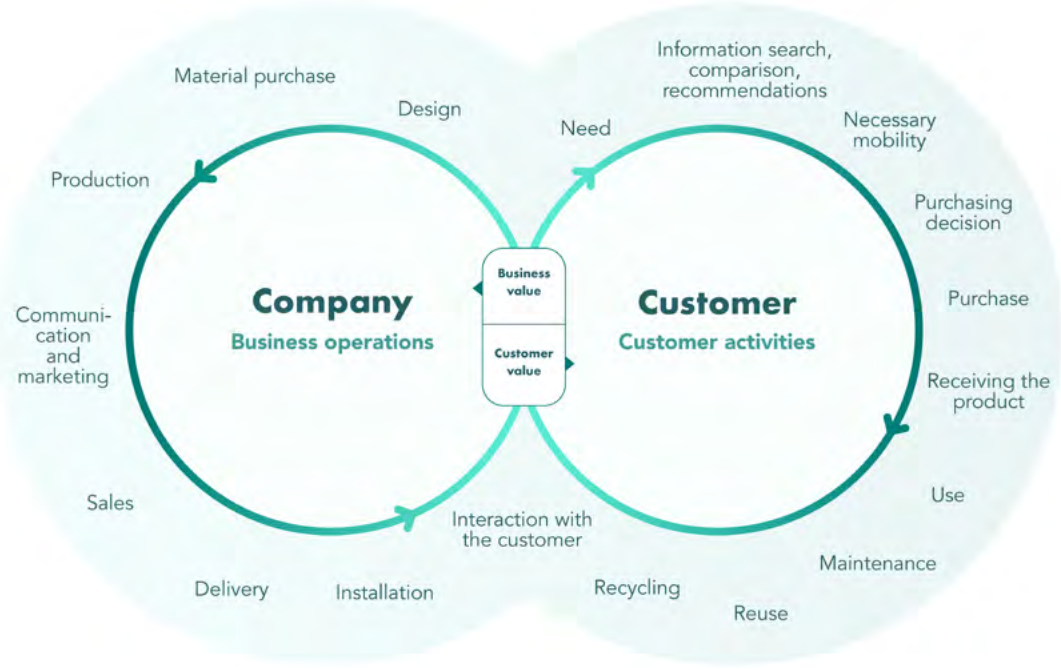


Figure 1. The double loop helps to understand the current state and opportunities of the company's customer-oriented environmental responsibility. (Figure: Enna Eloranta)

of customer-orientated communication regarding the company's environmental responsibility and its solutions. On the left side, environmental responsibility activities related to the company's production are considered.

The double loop template helps the company model in developing products, services and solutions how the customer is helped with making choices for sustainable everyday consumption and motivated to implement sustainable solutions and change daily operations accordingly. When representatives of companies in Päijät-Häme were interviewed in the VPK project, customer orientation was perceived as a somewhat distant matter, and communication about environmental responsibility was perceived as difficult. For these reasons, business modelling can help to see what a company should do and when customer value should be communicated.

When the project analysed companies and mirrored them in a double loop, the need for a triple loop-type solution was also noticed. It makes it possible to model the multi-level operations of co-working companies and find areas for development and content for communications. The loop can

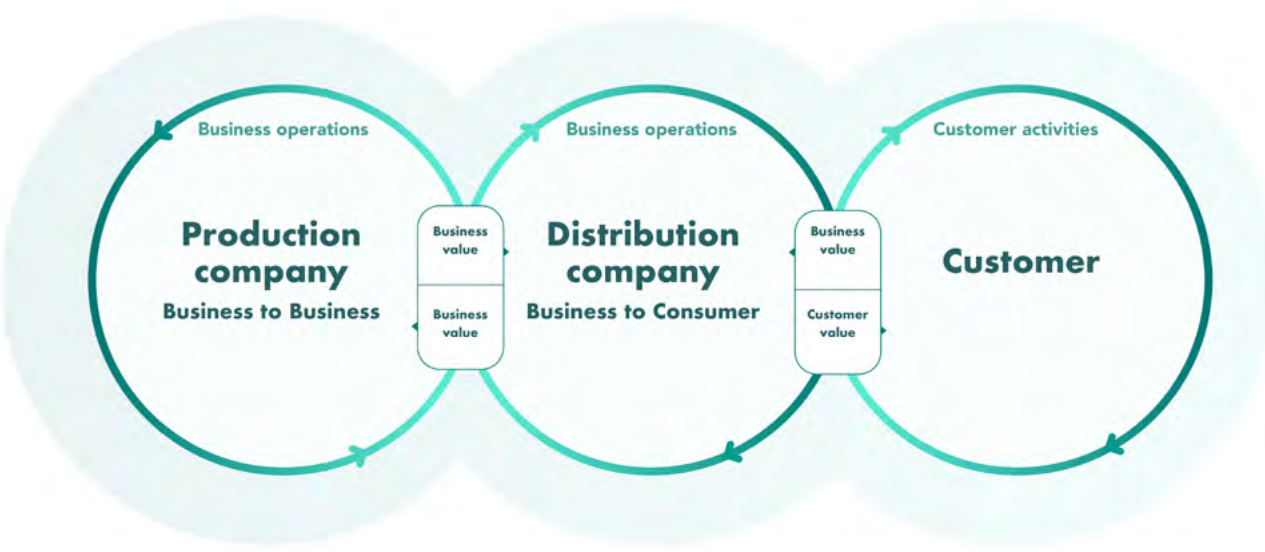


Figure 2. The triple loop is suitable, for example, for modelling the environmentally responsible operations and interaction of a production company, a retailer and a customer. (Figure: Enna Eloranta)

be used to model, for example, the activities and interactions of a company that produces and processes food products but sells them through a company that represents a distribution channel (Figure 2).

The triple loop in Figure 3 describes a business activity in which the company's customers produce services or products, and the company delivers them to the customers who need them. In this case, the company's platform serves as the interaction between the company and its customers. Such business models, for example, based on the use of a digital platform, are becoming more common. For example, many online resale sites or flea markets operate according to this model.

Many models of circular economy or other environmentally responsible business operations are presently described through exemplary companies that have been established in recent years in such a way that they already meet the requirements of customer-oriented environmental responsibility. However, a large group of companies established before these requirements for sustainable consumption should also be able to transform into bearers of double

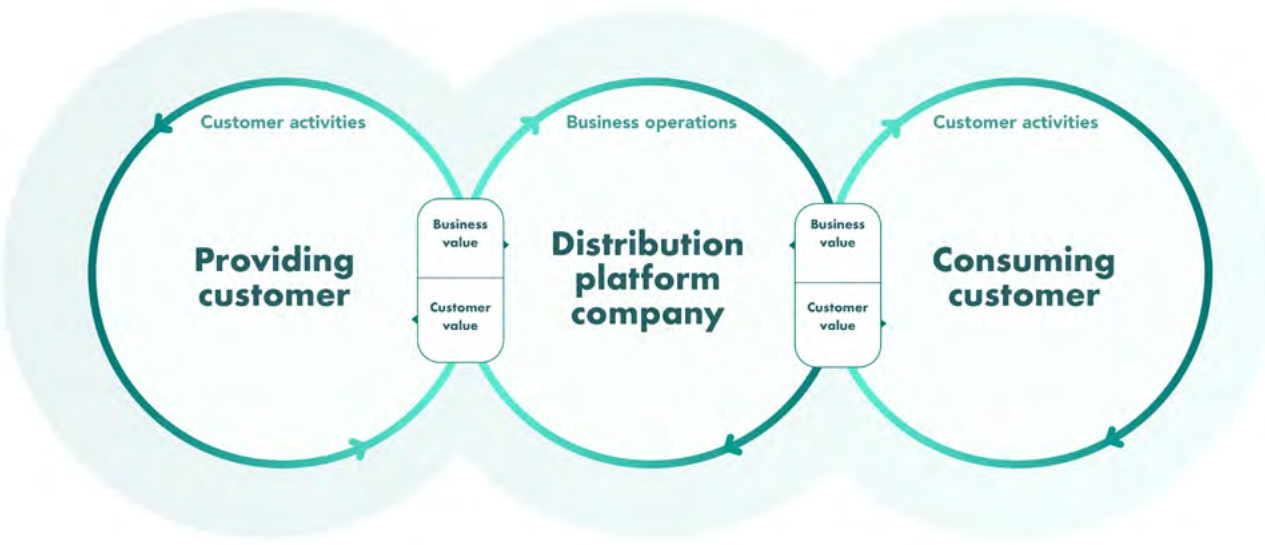


Figure 3. The triple loop is suitable for modelling the environmentally responsible operations and interactions of a customer providing services or producing products, the company that mediates through a platform and the consuming customer. (Figure: Enna Eloranta)

responsibility and decrease not only their production carbon footprint but also increase the carbon handprint that supports customers' environmental responsibility actions.

The VPK and VPKE projects want to help companies find a sensible way to take on dual responsibilities. The direction of change is sought by analysing existing activities and resources and planning meaningful change based on this. It is imperative to rethink from the customers' point of view the customer value that the company can produce. This also involves finding the most relevant content for building credible and effective environmental responsibility communications.

Based on the experiments carried out in the VPK project, it has already been established that comprehensive modelling of environmental responsibility measures in business operations helps to find suitable development points and directions, as well as customer value for communicating environmental responsibility. This is also possible for companies established during the era of the traditional market economy. Modelling in the project was tested through company analyses, interviews and analysis and development ideas carried out together with companies. Modelling the operating methods and means of environmentally responsible business also provides a sound basis for designing and converting such modelling into an actual business model, in which the need for resources and sufficient review of revenue streams are analysed according to the envisioned responsible solutions.

Towards the MOOC

During the autumn of 2022, three training seminars related to customer-oriented environmental responsibility were organised for companies. The themes of the seminars were based on the studies carried out at the beginning of the project and on the feedback received at the start-up event held in the spring with a panel discussion with company representatives (Picture 4–5).

The first training seminar dealt with customer orientation and how it can be utilised to develop the company's environmentally responsible operations. The programme consisted of expert speeches, case examples and practical development work together with the participating companies. The second seminar dealt with environmentally responsible service and product development in accordance with the same programme framework. The third seminar focused on environmental responsibility communication. The communication event introduced companies how to communicate understandably and avoid the pitfalls of greenwashing. In the practice-based stages, the companies could work on their own development targets in a guided manner, using practical models and gaining applied expertise from the seminar in addition to mere information. It was possible to participate in the events on-site and remotely.

In the autumn of 2023, the projects will launch a MOOC for customer-orientated environmental development for the companies. MOOC courses are online courses that are open to everyone. MOOC format allows

Picture 4-5. The first event had participants from a wide range of companies in different industries and organisations. (Pictures: Enna Eloranta)

for learning regardless of location and time, and companies can continue to appropriate the materials created in the projects through this solution. The purpose of the online course is to contain easy-to-understand, transparent materials in a business-oriented manner. Companies also receive templates through which they can concretely examine the possibilities of their own businesses from the perspective of customer-oriented environmental responsibility.

When designing a MOOC course for companies, the needs of companies regarding the content, structure and scope of the course must be considered. Through the VPK interviews in spring 2022, it became clear that small and medium-sized companies want the course to be easy to use as a course platform, with targeted information from field experts, plain language use and the opening of concepts. In addition, company examples from the companies' own industries and practical tasks applied on a company-by-company basis were considered beneficial.

In accordance with the principles of customer-oriented development, the aim is to meet these needs by co-creating course

content with the companies. Co-creation means that users participate in the design and testing of products and services. The peer learning group of the VPKE project in South Karelia is first involved in developing the mapping part analysing the starting point of companies and eventually the group pilots the entire training package, ensuring a seamless and functional whole.

The customer-oriented approach to environmentally responsible solutions offers companies unlimited opportunities for business sustainability. The material created and gathered for the MOOC course means to support companies in identifying their starting points and taking advantage of consumers' growing interest in environmentally responsible everyday life. This inevitably brings the company operations to a more environmentally sustainable basis. Everyone is a winner in the double responsibility presented: the customer, the company and the planet.

References

Accenture Interactive. 2022. Fjord Trends 2022. Cited 29 Aug 2022. Available at https://www.accenture.com/_acnmedia/PDF-169/Accenture-Fjord-Trends-2022-Full-Report.pdf#zoom=40

Euromonitor International. 2022. Top 10 Global Consumer Trends 2022. Cited 29 Aug 2022. Available at https://go.euromonitor.com/white-paper-EC-2022-Top-10-Global-Consumer-Trends.html

Gleim, M. R., Smith, J.S., Andrews, D. & Cronin, J. J. Jr. 2013. Against the Green: A Multi-method Examination of the Barriers to Green Consumption. Journal of Retailing 89(1), 44–61.

Greene S. & Korkman, O. 2022.The Stuff People Want- A New Horizon for Design in Finland. Cited 29 Aug 2022. Available at https://www.designforum.fi/app/uploads/2022/05/The-Stuff-People-Want_A-New-Horizon-for-Design-in-Finland.pdf

Kuluttajaliitto. 2022. Ympäristöväitteet ja viherpesu. Cited 4 Jan 2022. Available at https://www.kuluttajaliitto.fi/viherpesuviisari/

Kälviäinen, M. 2022. User-driven Service Design for Environmentally Responsible Consumption.

LAB University of Applied Sciences publication series, part 4. Lahti: LAB University of Applied Sciences. Cited 10 Aug 2022. Available at https://urn.fi/URN:ISBN:978-951-827-412-7

Lettenmeier, M., Akenji, L., Toivio, V., Koide, R., Amellina, A. 2019. 1,5 degree lifestyles. Targets and options for reducing lifestyle carbon footprints A summary. Sitra studies 149. Cited 8 Aug 2022. Available at https://www.sitra.fi/app/uploads/2019/06/1-5-degree-lifestyles.pdf

Salo, M. & Nissinen, A. 2017. Consumption choices to decrease personal carbon footprints of Finns. Reports of the Finnish Environment Institute 30/2017. Helsinki: Finnish Environment Institute.

White, K. & Habib, R. 2018. SHIFT - A review and framework for encouraging ecologically sustainable consumer behaviour. Helsinki: Sitra. Sitra Studies 132.

Figure 1. Funes, D. 2017. Unsplash. Cited 1 Sep 2022. Available at: https://unsplash.com/photos/TyLw3IQALMs

Figure 2. Pop & Zebra. 2019. Unsplash. Cited 1 Sep 2022. Available at: https://unsplash.com/photos/kJZSIXoXrUE

Figure 3. Spiske, M. 2020. Unsplash. [Cited 1 Sep 2022. Available at: https://unsplash.com/photos/i5tesTFPBjw

Figure 4. Heftiba, T. 2017. Unsplash. Cited 1 Sep 2022. Available at: https://unsplash.com/photos/4xe-yVFJCvw

Mirja Kälviäinen

Extended business purpose and responsibility — Example from Lahti Houses

Abstract

This development case is part of the Ministry of the Environment's Suburban Research Project (Lähiöohjelma). The case looks at the Lahti Houses (Lahden Talot) rental organisation's possibilities to develop behaviour-changing measures to reduce the carbon footprint of their residents. In this student-based design for behaviour change project, the aim was to create ways to inspire residents living in rented apartment buildings to save water and electricity and sort waste appropriately. The development case serves as an example of companies' carbon handprint and extensive social and environmental responsibility.

Keywords: Behaviour change, environmental responsibility, carbon handprint, rental houses

Corporate carbon handprint example of environmentally responsible living

Finland's sustainable development strategy for 2022 emphasises carbon neutrality, a sustainable energy system, consumption and lifestyle (Suomen kestävän kehityksen toimikunta 2022). The transition to environmentally responsible consumption is an essential target for urban development. In Finland, our daily consumption accounts for about 70% of environmental impacts and housing accounts for about 30%. The total consumption effects should be reduced by up to 70%–90% from the current level to maintain global warming within only 1.5 degrees of limits (Akenji et al. 2019).

The Joint Mukkula project of the Ministry of the Environment's Suburban Programme also wanted to carry out research and measures on this key consumption change challenge of urban development. Lahden Talot, Lahti Houses, which has a rental housing stock in Mukkula, was chosen as a partner for the development. The starting point was also the Future Carbon-Neutral and Self-Sufficient Suburb project 2020–2022 of LUT University's Laboratory of Sustainability Change, which operated in parallel with the

Joint Mukkula project.

Consumers and, in this case, residents of rental houses are often tied to the actions of the concrete infrastructure and the services they use in terms of how they can reduce their environmental impact. Because of this bond, the actions of companies are needed to support consumption change towards environmental responsibility. (Kälviäinen 2022). The environmental responsibility of companies, in addition to their actions, also extends to helping consumers to reduce their environmental impact. In addition to reducing their carbon dioxide emissions and other environmental impacts, companies must calculate what climate benefits their product, process or service could offer. The question is, what emissions reduction potential could they offer to their users? This suggests whether they can produce some important social good, such as, in this case, the environmentally responsible activities of residents. In addition to the company's own carbon footprint reduction, such actions represent the perspective of a positive carbon handprint that is needed. (Sitra).

This article presents a development case carried out in the spring of 2022, in which the LAB University of Applied Sciences' Sustainable Service Design master's degree course researched and developed communication and interventions guiding environmental responsibility in the three Lahden Talot Mukkula housing units consisting of apartment buildings. In order to protect the privacy of the residents, the participating housing units are not identified in this article. The development targets were first, the sorting and recycling of waste and, second and third, the reduction of electricity and water use.

Methodologically, this research-based development case applies the design advice produced by behaviour change research and contextual resident information and observation. The guidance produced by the psychology of behavioural change and influencing has been applied through general behavioural psychology development tools and using tools explicitly created for design-type development. (Kälviäinen 2022).

Lahden Talot showing extended environmental responsibility

Since the carbon footprint related to housing accounts for about 30% of Finland's total consumer carbon footprint, the measures to reduce this have been considered in various ways for years by Lahden Talot Oy. The city of Lahti owns the company and provides rental housing services. In 2022, approximately one in ten Lahti residents lived in Lahden Talot dwellings, so reducing the carbon footprint of residents is of great importance on a city-wide scale.

At the heart of Lahden Talot's strategy is the resident experience. The company's actions aimed to reduce the environmental impact in terms of property maintenance, renovation projects, new construction and environmental measures for housing. In addition, the company's social purpose and extended environmental responsibility have included, as an essential part, influencing the residents' consumption activities. In the past few years,

various encouraging competitions have been held for residents in terms of reducing energy use and sorting waste. The Environmental Committee of Lahden Talot has planned environmental development projects and events, such as flea market events or counselling, in which residents have had the opportunity to participate. In 2021, the city of Lahti received the title of European Green Capital, and Lahden Talot shared information with the resident committees about the year's events. Residents were activated through campaigns in the form of yard cultivation and tree plantings, among other things, as well as by a beehive experiment. (Lahden Talot Oy 2021) .

Elina Rantanen, Environmental Manager of Lahti Houses, described the situation of tenant activities in such a way that although Lahden Talot provided good conditions for sorting waste and reducing water and energy consumption, the resident had the final responsibility for achieving the goals. There are also differences in the measures in terms of targeting the entire housing unit and its costs or directing activities at the tenant's own home and the expenses paid separately from the tenant's rent or fixed housing fees. In some housing units, the results of the environmental measures have been worse than in other units, and efforts were made to find such units in Mukkula as targets for resident-oriented development. Due to the significant housing service activities of Lahden Talot in the city of Lahti, it is possible to scale and apply the findings and solutions from Mukkula to similar housing units in the entire Lahti area.

Starting points for resident-oriented planning of sustainable housing

Design and media master's degree students carried out the development work in the Sustainable Service Design course in May 2022. The purpose of the course was to introduce them, through an applied project, to the psychological and service design means of transforming consumption into an environmentally responsible direction. The students were divided into three groups of five to six people, each dealing with a single activity: sorting and recycling waste and reducing electricity or water use. As a starting point for their work, each group examined the Finnish society's situation regarding these activities, future trends and stakeholders.

Vilma Halonen, a researcher in LUT University's Laboratory of Sustainability Change research group in the Future Carbon-Neutral and Self-Sufficient Suburb project, also presented them with a 2021 questionnaire study's results on the formation of the carbon footprint of Finnish-speaking Mukkula residents. Results from 264 respondents reported that the impact of housing in Mukkula reached 29% of the total consumer footprint. In response to the development case, 34% said they had considered switching to green electricity, and 86% said they had recycled all household waste. Young respondents were more interested in switching to green electricity, and older baby boomers said they were doing more about recycling and repairing.

In order to achieve real resident orientation, the students were arranged to carry

out contextual fieldwork as observations and resident interviews in the target houses. For the interviews, Lahden Talot's representative and the course teacher prepared a press release, which was distributed to the front doors of the targeted housing units. The press release clarified that the students came to interview the residents for a couple of hours on behalf of Lahden Talot about the environmental responsibility measures. The residents noticed the well-presented bulletins and were looking forward to sharing their views on the challenges and actions related to environmental responsibility.

The qualitative data produced by the interviews and the resident comments related to the development topics were analysed in a content analysis-type manner, looking for categories and emerging themes. User personas were also created from the material to describe the actors living in housing units, even very different actors and their needs or attitudes towards the development topic. Based on fundamental research, the user persona describes an actor profile belonging to a particular group of people in an archetypal way. It involves a possible description of the demographic characteristics of the people in question and attitudinal and customary descriptions. (Stickdorn et al. 2017, 40–41).

In order to assist the development of interventions that activate residents in targeted environmental activities, students were presented with user understanding related to the psychology of behaviour change and guidelines produced by related psychology. These included defining the influence of thinking biases in fast thinking and various factors of behavioural change and the need for a service path-type of process in behaviour change, where guideline-based interventions and change factors could be located (Kälviäinen 2022; Kälviäinen 2021). Figure 1 shows how different factors that support starting behavioural change, capabilities and habit formation fit into different, related phases of the action in the change process.

Tools related to these theories were made available to students as the means of analysis and stimulus for brainstorming. Sitra's SHIFT tool for design that supports sustainable consumption describes social, habit-bound, identity-bound, emotional and thought-appealing factors and factors related to concretisation (White & Habib 2018). The COM-B model explains the simultaneously needed capabilities, opportunities and motivational factors for knowledge, environmental affordances, social interaction and interest points which are prerequisites for transforming behaviours (Michie et al. 2011). The behaviour change support cards explicitly developed for design and development ideation were Design with Intent cards built on the foundations of behavioural and environmental psychology and Flashcards based on the psychology of behaviour change (Lockton 2018; Center for Advanced Hindsight 2018). In addition, decision-making moments were discussed since they are interesting spots in actions where the prompts that stimulates action in the right direction should be placed (Fogg 2020).

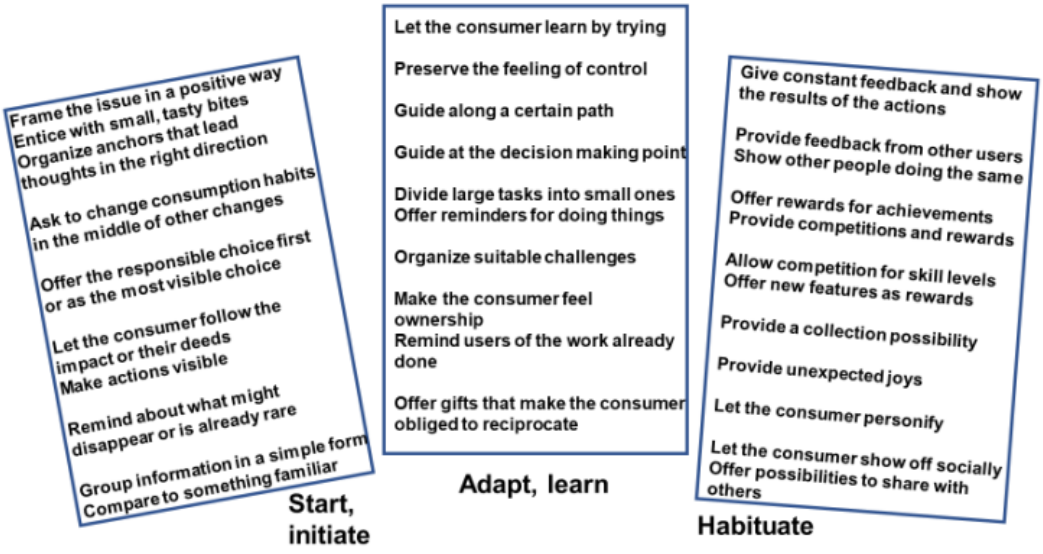


Figure 1. Examples of guidelines from the psychology of behaviour change that are suitable for shaping the different stages of the behaviour change process. (Kälviäinen 2021)

Results of research and design to activate residents

The sorting and recycling of waste promotion design was carried out in a housing unit with 63 apartments and 153 inhabitants. The unit in question had sorting problems, and things that did not belong to the waste shed, such as furniture, ended up there. The communication for resident immigrants' language challenges and cultural differences made suitable communication difficult. An important starting point was that there would be a significant change in waste management when the sorting rules and waste management operator changed at the beginning of 2023.

As a result of the interviews, it became clear that some residents did not even understand the benefits of sorting. Their view was supported by a lack of transparency related to waste management, which made one think that the waste eventually ended up in one landfill. There was also a lack of knowledge about sorting, as some residents felt they did not even produce sortable waste. The inhabitants even felt their

landlord (the *city*) did not care, so they did not have to care either. Residents who tried to sort their waste thought that too much was accumulated, put in the wrong bins, the wrong things were left in the waste shed, and waste was even thrown from balconies, which also increased waste management costs. The housing unit's waste shed was also perceived as unpleasant. One main user group for the waste canopy was children who could not see the waste bins or instructions or could not read. In this case, the waste problem arose even if adults at home had filled the garbage bags correctly.

Observation and documentation of the waste shed revealed it was in an unpleasant state and carelessly arranged. Signs and waste bins were miscellaneous, and the labels and terminology were confusing. The observation reinforced the view pronounced by the residents that the shed was in an untidy state and operated poorly in a functional sense.

As a solution, the student group proposed two different waste sorting games created with very concrete images and their distribution both to homes and in an event called the rubbish rampage that might be organised. Figure 1 shows an example of a game aimed at learning how to sort waste from the pictures or brought to the site by the residents. The different coloured and

Picture 1. A general view of a Bin it! waste sorting game where different waste cards and bin cards should be combined in a correct sorting manner. (Picture and the game idea: Anu Niiranen, Elina Köngäs, Kirsi Heininen, Miina Isoranta, Daniel-Jose Hänninen, Sanna Kaitakari and Riina Riihonen).

well-marked bins serve as a stimulus for thinking about sorting, and the rewards are different types of badges.

The student group also planned to rearrange the waste shed and clarify the associated signage. The purpose of the proposed solutions was to create an image of recycling as a matter of social and societal importance. The gamified solution had a significance related to the learning of sorting and the ability to perform it, as well as a reward meaning, as various competence badges accompanied the game. The game's purpose was to make sorting a joyful and inspiring thing and to allow teaching the subject to children in an engaging way.

Saving electricity proposals were directed at two housing units in two blocks of flats, one of which had 62 dwellings and the other 68. It was possible to promote electricity savings in the common areas of the housing units and in the residents' apartments, for which they made their own electricity contracts and paid separately. In the context of the energy crisis in 2022 and the related considerable rise in electricity prices, rates and reducing electricity use were widely discussed in the media.

Based on the interviews, the group created different user personas with varying attitudes towards electricity use. The personas clarified the relationship between residents and their actions regarding electricity use and the running of daily life as a whole. The older adult residents included a single Freezer persona who spent a lot of time at home, wanted stability in things and picked a lot of mushrooms and berries in the traditional spirit of self-subsistence. Such a person was happy to save electricity but also needed advice. The Everyday Life Heroes were younger inhabitants with families who had already switched to eco-electricity and engaged in small acts that did not change daily life. They, too, were hoping for more saving tips. The Easy and Cheap personality type consisted of families living alone or with older children, for whom an easy life at the lowest possible cost was essential. They had no interest in electricity-related matters, they did not think that they could influence the adjustments in the house, and the lowest price solved the choice of electricity. However, they were curious about the change but were waiting for ready-made solutions.

As a solution, this development group proposed practical electricity-saving tips as advice cards that could be distributed to residents' homes and also presented as posters next to the house notice boards or in similar communication places (Figure 2). The saving tips had been pre-selected so that getting started wouldn't fall on the difficulty of deciding on the target to start up with, and they had also been made so simple that everyone could implement them. In connection with the card, the residents were thanked for their current good activities of saving electricity, and the cards further stressed the importance of small transactions. A communal competition and award were proposed as a 10% electricity savings target per year in the housing unit, which was promised to be celebrated together in a year. The message also

Picture 2. A sample card that distributes selected electricity-saving advice (Picture and saving instruction ideas: Anna Leinonen, Paula Nurminen, Henna Parkkinen, Eija Pimiä and Janne Suontaus).

activated peer-to-peer activities by monitoring one's own electricity consumption and telling the neighbours how much each person has saved and how.

The minimisation of water consumption was investigated in a housing unit of three apartment buildings with 137 inhabitants and a water consumption of 211 litres per day per inhabitant. The inhabitants did not pay for the water consumed and could not monitor their water consumption. The residents of this housing community mainly consisted of elderly couples who had lived in this housing company for a long time, as well as large families.

According to the interviews, the old residents already saved water, and the water consumption of large families with children living in the house was naturally higher than that of older adults. This housing unit was marketed to families with children because the apartments were reasonably large. The interviews revealed that residents needed more information about water consumption and its environmental impact. Until now, the communication of information has taken place in Finnish, providing only basic information. The housing units also had Facebook groups, mainly used by active residents who had lived in the houses for a

Picture 3. An image of a rubber duck to be used as stickers was created to inspire the saving of water consumption. (Picture and the duck sticker nudging: Jenni Jokela, Lotta Lanamäki, Salla Anttila, Taru Kantonen, Oona Rouhiainen)

long time. Common spaces, such as the sauna, might also serve as essential spaces for transmitting the information.

The proposed solution was designed specifically for families with children since they had a high water consumption. The housing company has many families from different cultures, and communication in Finnish for adults can be ineffective. The solution aimed to address the children and create messages that could be understood visually. In the messages, a rubber duck, executed as static stickers, carried our adventures at the contact points related to water use in the common areas (Figure 3). The idea of a sticker allowed water-saving reminders

to be attached to different places. It was also possible to distribute the same stickers to residents' homes in resident letters. The key contact points of water use were the public laundry room, the club room washing basin and the shared shower. The information was based on Sitra's three water-saving tips. This more extensive information could be attached to labels. In the future, residents could be enabled to monitor the housing company's water consumption on the website with the help of a QR code in the corridor. This monitoring service should also contain information on the environmental impacts of water savings and its benefits for daily life. As a reward for the savings incurred, concrete gifts were proposed to be given to the housing company, for example, flowers or a new tree for the yard.

Feedback from Lahden Talot

A feedback discussion on the results of the development work was held with the Environmental Manager of Lahden Talot, Elina Rantanen, in August 2022. She considered the results well thought out but not very new considering the many things Lahden Talot had already tried. However, she pointed out that in the interviews and solutions, the right things had been asked from Lahden Talot's point of view, so the end results were good and exportable to practice in different ways.

Solutions that had sought to promote an interest in adults through children were of particular interest. Lahti Houses had even set bans stopping children from taking out waste, but it was also possible to think about it by inspiring children to take the right course of action. It was also important in the solutions to observe the public places in housing communities where Lahden Talot can bring out different operating messages.

The inspiring, easy-to-implement, and scalable solutions were attractive for Lahden Talot since it is impossible to implement laborious solutions related to only one housing site due to a lack of resources. Regarding the produced information material, one model to utilise it would also be when there are inquiries from residents. The information related to the inquiry could be sent targeted to the resident asking for advice. Current interest or change situations are also good times to start a campaign. Saving electricity during the high-price situation in 2022 would be an excellent opportunity to execute an electricity-savings campaign or guide waste sorting when the sorting ways and the operator change at the beginning of 2023.

Rantanen also saw that versatility was influential in the solutions so that a letter carried home for adults and a combination of a game for children could work to reach different target groups. Rantanen also considered it essential for the company to see from the resident interviews that the information provided electronically on the website did not reach older Mukkula residents. Yet, Lahden Talot had often provided information in this way. Messages sent concretely to residents' homes and information communicated understandably seemed necessary when trying to spread environmentally responsible behaviours among residents.

Regarding resident information, an important understanding that emerged from the interviews was that the things that Lahden Talot had thought they had communicated sufficiently were unclear or even unknown to the residents. This further suggests the need to communicate more with the residents, by different means and in an engaging, understandable or illustrated way. Especially in the case of language problems affecting immigrants, it would help to concretise things through visual communication. Still, it would also help reach the children as a resident group. The necessary information and instructions should be presented in channels suitable for different residents and in ways that different customer groups can understand. Concepts like carbon dioxide emissions are difficult to understand, and it is worth thinking about ways to communicate them to the residents clearly and understandably. User data and user persona descriptions further clarified the understanding that not all residents of rental apartments are the same.

Because Lahden Talot has many housing units, it is impossible for an environmental manager to constantly observe concrete issues related to the housing units' environments. In the observational images documented by the student groups, the state of the waste shed was particularly surprising in relation to how it had been instructed to be managed and the necessary information to be placed. This also refers to the importance of providing the maintenance personnel with understandable instructions on organising the living environment. The operating infrastructure and the motivation or steering are very important in supporting sustainable consumption activities. The discovery of key operational environments and locations related to the decision-making moments of the consumption activity and their steering power is also associated with the targeted observations carried out in this development work, and identifying some of the hot spots where guidance and motivational information should be placed was possible.

The end result of this development case is that Lahden Talot will start to disseminate the material designed to engage the inhabitants to change their consumption habits. Typically, Lahden Talot launches 1–2 campaigns per year directed at residents. In the autumn of 2022, a campaign related to saving electricity is launched, as due to the energy crisis, it is an important requirement even from a societal point of view, and it involves considerable financial savings opportunities for both the housing company and the residents. The residents also expressed concern about electricity consumption and how that consumption will affect rents as the price of electricity rises.

Perspectives of the methodology for behaviour change

In the interviews, the residents of the housing units were interested and enthusiastic in sharing their own user information and developing their views. Since the representative of Lahden Talot stated that it is not always possible to go to the housing units themselves

and, for example, observe everything about their operating environment, it would be possible to activate resident reporting for this. This could be a place for sending pictures taken with a mobile phone so that they are accompanied by information about the type of challenge or problem connected to the environment and from which housing unit the picture was taken.

An essential point in the resident interviews was that the residents did not feel that the company or the city behind it cared about them. Versatile communication, helping with challenges, such as sending information material to inquirers, increasing the possibilities for interaction, and giving feedback by various means, would inhibit this kind of concern. A well-functioning and clean living environment would also bring a sense of caring to the residents and guide them to take care of their living environment, even when it consists of rental apartments.

For an actor such as Lahden Talot, the use of the psychology of behaviour change has highlighted the opportunities to change partly automated daily activities and habits during moments of change in societal situations or operations. An actor such as Lahden Talot plays a key role in managing the implementation of socially agreed large changes in the general operations of housing units or by influencing practices related to sustainable consumption on an individual basis when residents move into a new apartment and housing unit.

Developing solutions by combining current societal and trend information related to the target activities, carrying out contextual fieldwork and applying the design guidelines produced by the study of behavioural change was worthwhile. Even a fast project can use the combination of such methods to produce valuable and applicable results for promoting environmentally responsible consumption and housing in the suburbs. Concretization, suitable distribution channels and ensuring comprehensibility are essential issues in the solutions produced. In this kind of work, residents could be activated to carry out the necessary contextual fieldwork and self-reporting to cover a diverse selection of housing sites.

References

Akenji, L., Lettenmeier, M., Toivio, V., Koide, R. & Amellina, A. 2019. 1.5-Degree Lifestyles: Targets and options for reducing lifestyle carbon footprints. Technical Report. Hayama, Kanagawa: Institute for Global Environmental Strategies. Helsinki: Aalto University and D-mat ltd.

Center for Advanced Hindsight. 2018. Resources Uploads Flashcards01. Cited 12 May 2022. Available at https://advanced-hindsight.com/wp-content/uploads/2018/02/CAHFlashcards01.pdf

Fogg, B. J. 2020. Tiny Habits: Why Starting Small Makes Lasting Change Easy. Virgin Books.

Kälviäinen, M. 2021. Heuristics in Design for Behaviour Change. In Özge Cordan, Demet Arslan Dinçay, Çağıl Yurdakul Toker, Elif Belkıs Öksüz, Sena Semizoğlu (Eds). Game + Design Education. Proceedings of PUDCAD 2020. Online June 24-26, 2020. Springer Cham. Springer Series in Design and Innovation Vol 13, 109-117.

Kälviäinen, M. 2022. User-driven Service Design for Environmentally Responsible Consumption. The Publication Series of LAB University of Applied Sciences publication series, part 4. Lahti: LAB University of Applied Sciences. Cited 10 Aug 2022. Available at https://urn.fi/URN:ISBN:978-951-827-412-7

Lahden Talot Oy. Vuotemme 2021. Cited 8 Oct 2022. Available at https://vuosikertomus2021.lahdentalot.fi/

Lahti Houses. 2022. Reducing the carbon footprint of housing and measures at Lahden Talot Oy. Power point presentation.

Lockton, D. 2018. Design, behaviour change and the Design with Intent toolkit. In Niedderer, K., Clune, S. & Ludden, G. (Eds.) Design for Behaviour Change. Theories and Practices of Designing for Change. Abingdon: Routledge, 58-73.

Michie, S., van Stralen, M. & West, R. 2011. The behaviour change wheel: A new method for characterising and designing behaviour change interventions. Implementation Science. Vol. 6 (42). Cited 18 Oct 2019. Available at https://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-6-42

Sitra. Carbon handprint. Dictionary. Cited 28 Aug 2022. Available at https://www.sitra.fi/en/dictionary/carbon-handprint/

Stickdorn, M, Lawrence, A, Hormess, M. & Schneider, J. 2017. This is service design doing. Applying Service Design Thinking in the Real World. A Practitioners' Handbook. Sebastopol, CA: O'Reilly Media.

Suomen kestävän kehityksen toimikunta. 2022. Kestävän kehityksen toimikunnan strategia 2022–2030. Luonnon kantokyvyn turvaava, hyvinvoiva ja globaalisti vastuullinen Suomi. Helsinki: Valtioneuvoston kanslia. Valtioneuvoston kanslian julkaisuja 2022:6. Cited 8 Oct 2022. Available at https://julkaisut.valtioneuvosto.fi/handle/10024/163958

White, K. & Habib, R. 2018. SHIFT – A review and framework for encouraging environmentally sustainable consumer behaviour. Helsinki: Sitra. Sitra Studies 132. Cited 8 Aug 2020. Available at https://www.sitra.fi/julkaisut/shift/

Annariina Ruokamo

Towards the unknown – How to study clothing's use phase

Abstract

LAB University of Applied Sciences is a partner in the Telavalue project, which started at the beginning of 2022. Telavalue is part of the Telaketju cooperation RDI network, which is a national ecosystem of knowledge. The network enables the development of circular economy business models and the national circular economy system in Finland. This time, in the Telavalue project, LAB is playing a leading role by studying the design process in circular economy business models and in the relatively novel research field of a garment's lifespan and the expected lifetime of a garment. This article reviews how to study the environmentally impactful use phase of clothing. There are several research methods for studying the use phase, but with the help of technology the collected data is more reliable. What makes the use phase research essential is that prolonging a garment's lifespan is one of the most effective approaches to sustainable consuming. To understand the consumer habits and personal patterns of use, we should get to study the insight information provided by personal wardrobes.

Keywords Circular economy, textiles, clothing, garment use, lifespan, use phase of clothing

LAB is continuing the ambitious work on circular design in the Telaketju network

Started in February 2022, the Telavalue project's main goal is to support and build value chains for the sustainable production, use and cycles of textiles. The aim is to ensure efficient product use via circular design and novel business models, and to ensure efficient textile material circulation via recycling. Telavalue is part of the Telaketju cooperation network that has promoted textile recycling since 2016. More than just one or two projects, Telaketju is a national Finnish R&D initiative for textile recycling and sustainability. The latest of the Telaketju projects, Telaketju 2, ended in April 2021. The Telaketju 2 project developed the collection, sorting and refining processes of end-of-life textiles. Product design for circularity was

Picture 1. The Telaketju network enables the development of the circular economy of textiles. In the photo there are different stages of processing end-of-life textiles into new recycled fibre. The first Nordic textile recycling facility opened in 2021 in Paimio, Finland. (Picture: Annariina Ruokamo)

one of the main subjects under research at the Institute of Design and Fine Arts at LAB University of Applied Sciences.

The work developed in Telaketju projects 1 and 2, in which LAB University of Applied Sciences has played a major role in researching, among other subjects, the end-of-life-textile identifications and circular design practices. In February 2022 the Telavalue project started, which is directly linked to earlier Telaketju projects. The vision of Telavalue is to solve sustainability and waste problems related to the current textile system through the circular economy. It is, again, a Business Finland Co-Innovation project that consists of a public research project and company projects.

In autumn 2021, a sorting and recycling plant for discarded textiles was opened in Finland. The plant is operated by Lounais-Suomen Jätehuolto and Rester Oy and is now fully functional. It has the capacity to recycle both post-consumer textile waste and textile waste from companies. The end product is recycled textile fibre that can be spun into yarns and knitted into fabrics, but in Finland we currently do not have a yarn spinning mill that could turn this fibre into yarn. Building a recycling ecosystem in Finland is urgent, since the European Union is

Picture 2. The Designer's Guidelines for Circular Clothing Design summarises the basic information on textile collecting, sorting and recycling to help the designers to understand how certain design choices affect product circularity. (Picture: Iida-Maria Remes)

demanding that all EU Member States must establish systems for the separate collection of textiles by 2025. Finland has now prepared to arrange these systems in the next year. Also, the European Union is preparing a textile strategy that will guide the circular economy from as early on as during the design stage.

For recyclability to be possible, it must be taken into account already at the design stage. From autumn 2019 to spring 2021, LAB University of Applied Sciences surveyed the role of product design in the circular economy of textiles and clothing in the Telaketju 2 project. As a summary of the research, *The Designer's Guidelines for Circular Clothing Design* was published at the end of the project by LAB's RDI specialist Annariina Ruokamo and Wearable Design alumna Mirka Uunimäki, who at the time was involved in an internship for Telaketju (Ruokamo & Uunimäki 2021). The Finnish publication aims to raise awareness of how large the impacts and opportunities of designers'

actions are in the clothing industry. With the right information, the designer can more easily balance the design choices for the circular economy. The guidelines summarise the basic information of textile collecting, sorting, and recycling to help the designers understand the processes aiming for the circular economy. This information helps designers to visualise how certain design choices affect product circularity.

In the ongoing Telavalue project, the product design research work at LAB will now focus more on designing for different circular economy business models such as product-as-a-service models, renting, leasing, repairing, and so on, with the main question being what kind of requirements there are for a designer to design for these different circular economy business models. One novel point of view being studied at LAB is the research into a garment's use phase. As part of garment manufacturing, the use phase is responsible for a significant proportion of the environmental impacts of the garment's total life cycle. Still, the lifespan of the clothing is hardly studied, since collecting data on the use phase is considered difficult.

Doubling the number of times a garment is worn would play a significant role in cutting down the emissions of the textile industry

Customer behaviour changes are sometimes hard to forecast – the pandemic has shown that the world we live in is hardly predictable and that the future might not have been this unpredictable after a certain degree of stability achieved before the hit of the pandemic and the war in Ukraine. The changes in consumer habits in the field of fashion have affected the forms of consuming fashion. In addition to the prolonged coronavirus crisis, the clothing industry has been affected by a significant structural change. Even before the pandemic, the growth of online shopping, multi-channel and more casual clothing were on the rise, but the pandemic strengthened these trends (Suomen Tekstiili ja Muoti 2021a).

While the instability in clothing production during the pandemic may have increased consumer interest in sustainably and locally produced goods, ultra-fast fashion has overtaken fast fashion at an ever-increasing pace. The brands like *Shein* have entered also the Finnish market, mainly via social media platforms such as TikTok. The videos made on these platforms are mostly *unboxing* and *haul* videos, meaning that typically young female users open a package they ordered from Shein and present the products therein. Similar videos are made for other stores' products, but on TikTok, Shein-themed videos already have 35.2 billion views. In spring 2022, Shein, founded in 2012, became bigger than H&M and Zara combined when measured by market value. Shein publishes an average of 6,000 new products on its website every day (Harju 2022).

The rise of ultra-fast fashion is alarming, since the lifespan of clothing has already shortened from the golden days of vintage fashion, and it is causing an enormous

environmental burden. The Ellen MacArthur Foundation has stated that the average number of wears per garment is 160. This means that, if worn once a week, a garment is in active use for slightly over three years. It is estimated that greenhouse gas emissions from the textile industry could be decreased by 44% by doubling the wears of garments. In Finland, the lifetime of clothing was surveyed by the TEXJÄTE project in 2015. The findings of the survey were that Finns use blouses for approximately five to six years and T-shirts for four and a half years (Suomen Tekstiili ja Muoti 2019).

Studying the use phase – how to collect insight information from personal wardrobes

Interest in product lifespan research is growing and designers are working to develop clothes that last longer. Still, the lifespan of clothes and the factors affecting it have been studied very little. However, it is possible by carefully constructed surveys that provide key data relating to actual garment use. To study a garment's overall footprint during its whole lifespan, the research is mainly based on a life cycle assessment (LCA). In the LCA calculation of products, *functional units*

Picture 3. The popularity of ultra-fast fashion has increased, especially on social media platforms such as TikTok. The environmental impact of fast fashion and ultra-fast fashion is enormous, and these kinds of disposable fashion trends are in contradiction to the fact that, from the point of view of climate change, clothes should be worn more often and for longer. (Unsplash 2020)

serve as measurement units. In clear contrast to this, LCAs in the context of clothing often use a number of garments or a certain amount of material as a unit, leaving out the use phase of the products (Klepp et al. 2020).

An LCA-based study was also performed at LAB by the Wearable Design student Mirka Uunimäki, who graduated in May 2022 after writing the thesis *Life cycle assessment as a sustainable clothing design strategy for women's wear collections*. The result of the study was that an LCA can be used as a strategy for guiding conscious design choices under certain conditions. As with many LCA studies, this thesis also leaves out most of the garment's life cycle, i.e., the use phase. The effects of the patterns of use on the product lifespan and the emissions caused by it easily cover up to two-thirds of the environmental effects during the product's life cycle. This is one of the weaknesses of LCA, since as it is based mainly on the evaluated information and data banks, it does not consider the product's longevity or usability, which are recognised requirements for sustainable clothing (Uunimäki 2022).

In the Nordic countries, the study that is most referred to in this sector is *Environmental assessment of Swedish clothing consumption — six garments, sustainable futures* by the cross-disciplinary research programme Mistra Future Fashion in 2011–2019. In the study a life cycle assessment of six garments was used to evaluate the environmental impact of the selected garment's overall environmental impact during its total lifespan, including the use phase. These calculated environmental impacts were then scaled up to represent Swedish national clothing consumption over one year (Sandin et al. 2019). In order to study the patterns of the use phase, what is needed is data on use – considering the number of times a garment is worn, washed, ironed and tumble dried.

Determining the length of the use phase is simpler for products that are usually in continuous active use throughout the use phase (such as electrical products). When they no longer work, they are replaced by a new one. The use phase of garment includes both active and passive periods, and the purchase of new clothes does not necessarily replace the existing product and might even expand the owner's wardrobe. The concept of duration of use is therefore complicated (Klepp et al. 2020).

There are already other existing methods for consumers to calculate the number of wears. Olof Hoverfält has created a formula for this in order to calculate the average cost per wear by creating a table that also visualises the category frequency of use to be shared across all days on which any item has been used (Hoverfält 2022). Hoverfält has already collected 427 garments in his open-access report, and half of them are still in active use. Anyone can follow the project via his site. He has also photographed each piece of clothing on his website, and the site automatically draws various graphic elements from the use of the products (Sjöholm, E-L. 2021). Also, if you are interested in your own personal wardrobe data, a

student group at the Amsterdam Fashion Institute have created the Closet Mass Index (CMI) for tracking every single item in your wardrobe. This tool was invented for the sorting and organisation of a closet, but it could also be a meaningful tool for consumers to take part in the research on the use phase (Dirty Laundry).

In research, there are also some methods that can be used for measuring the use phase of clothing: qualitative interviews, focus groups, registrations, diary studies, wardrobe studies, wardrobe surveys, automatic data capture and experiments. One of the used – and relatively new – methods is the *wardrobe study*. This method is for gathering knowledge about clothing usage and asks questions about all the garments in one's wardrobe. The study, which can be recorded and photographed, gives the researcher access to experiences and opinions of the garment owners. A wardrobe study provides a lot of information and data to study, but on the other hand it is costly, time-consuming and difficult to complete for entire wardrobes and populations. *Wardrobe surveys* combine the advantages from both studies and surveys: from a survey the possibility of quantitative material, and from the study focusing on individual garments and their characteristics. This method is expensive and takes a long time, but it enables quantitative analysis (Klepp et al. 2020).

The use of clothing can be monitored using new technologies, such as radio frequency identification (RFID) for reading tags attached to clothing. Tags may contain electronically stored information. Using these technologies makes it possible for researchers to get precise information about the lifespan of clothes, which could also be combined with consumer research (Klepp et al. 2020). In the future, the use phase data might be more easily collected via technology if we had a digital passport: a system and garment-integrated microchips that would automatically collect the necessary information with the help of the right technology. Finnish Textiles & Fashion is preparing this kind of digital passport together with Technology Industries of Finland (Suomen Tekstiili ja Muoti 2021b).

Slowing down consumption is still key for sustainable actions

Despite the rise of ultra-fast fashion, research in 2020 states that consumers want durable goods to last between 1.7 and 3.6 times longer than they are currently (Wieser et al. 2020).

What needs to be taken into consideration is that expectations for a product's lifetime and the actual product lifetime may vary. The expectations might vary because of personal consumer habits, for example. Product quality is something that many Finnish brands are also aiming for. Quality products are also seen as sustainable. According to Mistra Future Fashion, if each garment is worn twice as many times before disposal, nearly half of the impacts are mitigated. Extending the active life of clothing requires manufacturers and retailers to produce and market more durable clothing,

and it also requires users to buy less of it (Sandin et al. 2019).

One of the main study questions in Telavalue's study considering end-product requirements is: how can we ensure that the expected lifetime and the actual (quality-based) lifetime are met? Currently, companies lack information on what consumer expectations are in terms of a product's lifespan. For example, Voglia has launched *The Product Promise* for their customers, which makes a promise to ensure the high quality of a product and one year of product warranty together with the product care service (Voglia 2022). To create these kinds of promises and services, companies would benefit from the insight information of customer expectations.

Ultimately, clothing is something to feel, something to wear, and it includes so many emotional aspects that may even be impossible to study. In the meantime, we can try to find ways to inform consumers about conscious garment use not only in sustainable purchasing, but most importantly, in slowing down consumption and taking care of existing garments in one's wardrobe.

The solutions for slower consumption lay not only in using old clothes for longer, but also in novel circular economy business models, such as a sharing economy and product-as-a-service models. Naturally, and not so surprisingly, there has been a debate going on with regard to the emissions side of sharing economy business models: whereas a rented garment might be washed more often than an owned garment, it may increase the emissions of one product at a time (Karasti 2021). There is still much research to be done by considering all the aspects from functionality to emotionality, and all kinds of routines that we as consumers might have. This research will continue in the Telavalue project, where LAB is leading the way for ambitious research on the design and consumption of fashion.

Picture 4. Prolonging a garment's lifespan is one of the most effective ways of achieving sustainable consuming. (Unsplash 2020)

References

Dirty Laundry. Amsterdam Fashion Institute. Cited 2 Sep 2022. Available at https://dirtylaundryamfi.wixsite.com/mysite

Harju, I. 2022. TikTok on täynnä Shein-videoita, vaikka ultrapikamuotijätti on ”pahin kaikista”. HS Nyt. Cited 2 Sep 2022. Available at https://www.hs.fi/nyt/art-2000008956671.html

Hoverfält, O. 2022. Wardrobe Diary. Cited 2 Sep 2022. Available at https://hoverfalt.github.io

Karasti, K. 2021. Vaatevuokraamot löivät läpi Suomessa – vaatteen lainaaminen voi aiheuttaa jopa enemmän päästöjä kuin omaksi ostaminen ja hävittäminen. Helsingin Sanomat. Cited 5 Sep 2022. Available at https://www.hs.fi/hyvinvointi/art-2000008156259.html

Klepp, I.G., Laitala, K., Wiedemann, S. 2020. Clothing Lifespans: What Should Be Measured and How. Sustainability. Vol. 12 (15), 6219. Cited 2.9.2022. Available at https://doi.org/10.3390/su12156219

Mateus Campos Filipe. 2020. Unsplash. Cited 2 Sep 2022. Available at https://unsplash.com/photos/ZKJQCWsKmPs

Markus Spiske. 2018. Unsplash. Used Blue Jeans. Cited 5 Sep 2022. Available at https://unsplash.com/photos/RDZZs9F53LE

Ruokamo, A., Uunimäki, M. 2021. Suunnittelijan opas kiertotalouden mukaiseen vaatesuunnitteluun. LAB-ammattikorkeakoulu. Cited 2 Sep 2022. Available at https://urn.fi/URN:ISBN:978-951-827-360-1

Sandin, G., Roos, S., Spak B., Zamani, B., Peters, G. 2019. Environmental assessment of Swedish clothing consumption – six garments, sustainable futures. Göteborg: RISE. Mistra Future Fashion report. Cited 5 Sep 2022. Available at https://research.chalmers.se/en/publication/514322

Suomen Tekstiili ja Muoti. 2021a. Tekstiilialan yritysten kasvu jatkuu, vaatealan tilanne epävarmempi. Cited 2 Sep 2022. Available at https://www.stjm.fi/uutiset/tekstiilialan-yritysten-kasvu-jatkuu-vaatealan-tilanne-epavarmempi/

Suomen Tekstiili ja Muoti. 2021b. Suomen Tekstiili & Muoti ja Teknologiateollisuus käynnistävät digitaalisen tuotepassin kehittämishankkeen. Cited 2 Sep 2022. Available at https://www.stjm.fi/uutiset/suomen-tekstiili-muoti-ja-teknologiateollisuus-kaynnistavat-digitaalisen-tuotepassin-kehittamishankkeen/

Sjöholm, E-L. 2021. Herra käyttökertakustannus. Helsingin Sanomat. Cited 2 Sep 2022. Available at https://www.hs.fi/elama/art-2000007811695.html

Uunimäki, M. 2022. Elinkaarilaskennan hyödyntäminen vaatesuunnittelussa. LAB-ammattikorkeakoulu. Cited 5 Sep 2022. Available at https://urn.fi/URN:NBN:fi:amk-2022052311289

Voglia. Tuotelupaus. Cited 2 Sep 2022. Available at https://www.voglia.fi/pages/tuotelupaus

Wieser, H., Hübner, R. Troeger, N. 2015. The Consumer's Desired and Expected Product Lifetime. In Cooper, T., Braithwaite, N., Moreno, M. & Salvia, G. (eds). Product Lifetimes And The Environment Conference Proceedings. Nottingham, UK. 17–19 June 2015. Nottingham: Nottingham Trent University. 388–393. Cited 2 Sep 2022. Available at http://www.plateconference.org/pdf/plate_2015_proceedings.pdf

Annariina Ruokamo

Immersiveness is leading the way for a new digital era of Fashion

Abstract

The past years of the pandemic revealed the unpreparedness of many textile and fashion companies for new sudden situations. The pandemic has shown the companies' rigidity in responding to these abrupt incidences, called *black swans* and *wild cards,* in the future forecasting field. As the pandemic will not be the last black swan in the future, companies need to develop their operations to enable profitable and continuous business in unexpected future situations. Such a sustainable operation responds more nimbly to consumers' changing ways of searching and obtaining information about the company or its products and services, primarily online.

Digitality is seen as one of the key elements in the change to more agile and sustainable operations. The LAB University of Applied Sciences' Digital & Sustainable Fashion Showroom project focuses on mapping these possibilities and developing solutions in the digitality of the clothing business. This article dives into the phenomena of ever-changing consumer behaviour and the solutions for companies to tackle the changing ways of consuming fashion. Digital fashion is often referred only to online shopping and webstore management. Still, digitality should be seen as a tool for so much more: sustainability management, sustainability communications and an operative tool for companies' sustainable growth in an unstable future. In the Showroom project, three Finnish clothing companies accompanied a development process where digital solutions and prototypes were designed to answer each company's challenges.

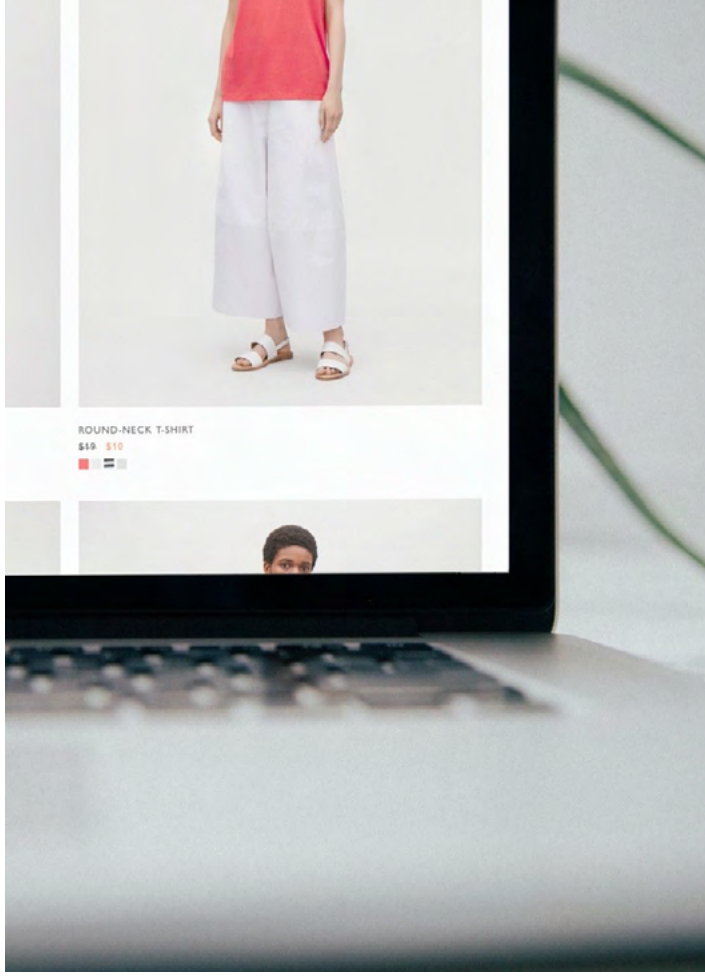
The Showroom project is funded as part of the European Union's efforts in response to the COVID-19 pandemic.

Keywords: Digitalisation, fashion, clothing business, digital fashion, sustainability, consumer behaviour, digital solutions, e-commerce, online shopping

The present and future of fashion is online

Online shopping and its digital services and opportunities are developing rapidly. From the consumer's point of view, buying is expected to be as effortless, easy and fast as possible. Efficiency can save natural resources, but what does digitalisation mean from a sustainability point of view? It is known that the unsustainable speed of the clothing industry should be curbed from the perspective of responsibility and climate change. In terms of business sales, fast-running e-commerce shipments are desirable for consumers and companies. Still, from a sustainability point of view, we should focus on targeting sales to meet the real needs of consumers. This, in turn, could also reduce the return rate of e-commerce orders.

The Finnish Textile & Fashion reported in June 2022 that the global clothing trade had become the most extensive online trade sector (Suomen Tekstiili ja Muoti 2022). According to Fashion Finland, the fashion store is going online and changing its shape at an ever-increasing pace. (Fashion Finland 2022). The popularity of online fashion shopping has been witnessed for a few years already, but the pandemic accelerated the explosive growth of online shopping. (Suomen Tekstiili ja Muoti 2021a) In 2021, the growth of online sales in clothing and footwear slowed to 10.4%, while in 2020, online sales grew by 18.9%. In 2021, Finns bought clothes and shoes from foreign online stores totalling more than half a billion euros and from Finland online stores totalling 126 million euros.



Picture 1. The present and the future of fashion stores are online. Even though online fashion shopping has been increasing for many years, the pandemic accelerated the explosive growth of online shopping. (de Luvio 2018)

On the other hand, foreign online sports equipment sales shrank by almost 10%. (Muoti- ja urheilukauppa ry 2022).

Many brands see growth potential in global markets, and international online

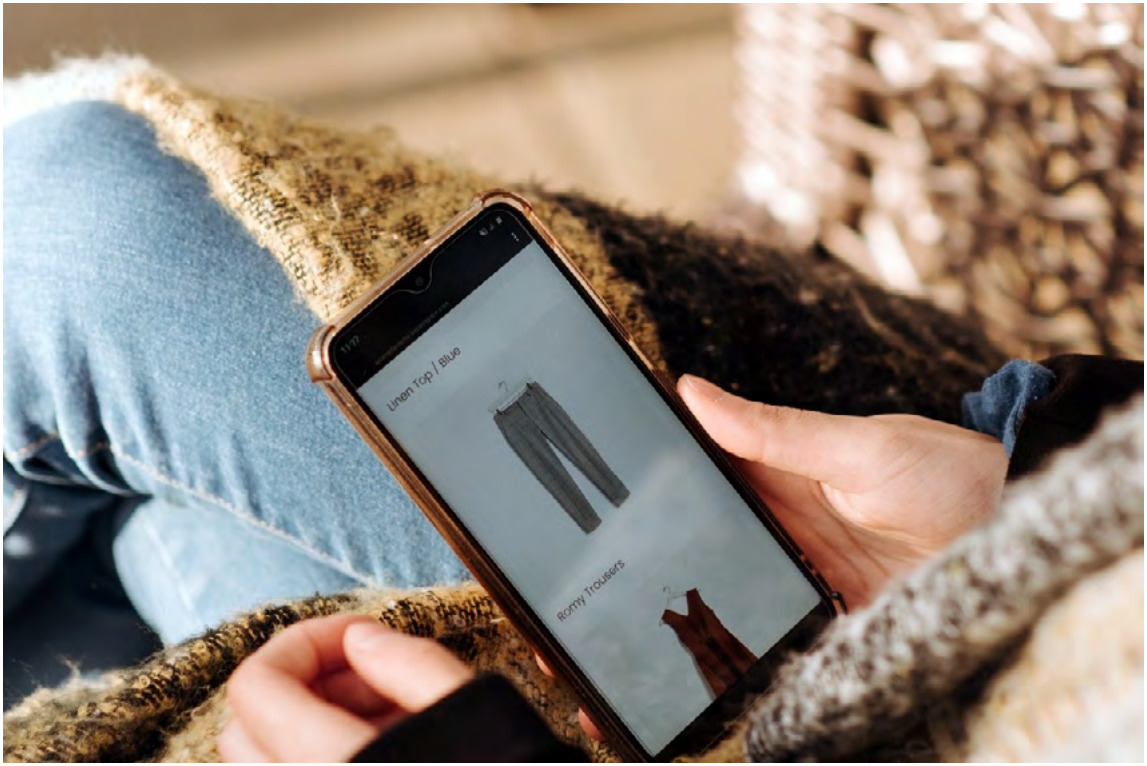
shopping can offer a fast route to conquering the world (Suomen Tekstiili ja Muoti 2022). Online shopping is one of the most central elements in companies' more agile business operations due to changes in consumption habits. However, it is worth remembering that digitality is much more than just online shopping. The possibilities of digitalisation are almost limitless, but on the other hand, the threats it brings cannot be wholly avoided either.

Change in consumer behaviour

In its 2019 NEXT Design Perspectives forecast, WGSN, focused on anticipating consumer trends, published six key trends guiding lifestyle and business, three of which are strongly related to digitalisation. According to WSGN's The Age of Systems forecast, system design will overtake product design in importance. The forecast involves, among other things, a shift from linear production chains towards circular economy models. Interesting and still relevant forecasts related to consumption were also in The End of More forecast, which predicts a change in people's need to own things. According to the forecast, people will seek *access over ownership* instead of owning an ever-increasing amount. The companies' focus will be on fulfilling consumers' wishes. The wish fulfilment will no longer comprehend only the material but will also be based on feelings, experiences and knowledge. People are expected to aim for quality instead of quantity in their consumption. This predicts the rise of the sharing economy in the consumer market. (Dexigner 2019).

According to the State of Fashion 2022 report, *social shopping* originating from social media is used to create a seamless shopping experience from finding a product to the moment of purchase. Different markets work in diverse ways, but mobile application payment methods, live streaming, augmented reality and other technologies are the future of companies (Finnish Textiles & Fashion 2021b). The Future Commerce online seminar organised by Business Finland's Experience Commerce program in November 2021 presented five trading trends, one of which is Live Shopping, which has become common in Finland. Business Finland's program director Aija Kalander states that Live Shopping is here to stay. Live Shopping events are interactive and entertaining events hosted, for example, by well-known social media influencers. According to Kalander, customers want interactive experiences with their favourite brands and expect personal service when shopping online. He states that the possibility to connect virtually with consumers on digital platforms has transformed a static online experience into a personal interaction. (Fashion Finland 2022).

Have we reached the point where buying online, as it is, is too dull? While shopping used to be a popular leisure activity, with the pandemic, currently, it has turned into a quick event where consumers only buy what they need. On the other hand, the longing for shopping events like Live Shopping can also stem from the number of goods: the difficulty of choosing is real when there are so many possibilities in the marketplace.



Picture 2. The future of online shopping is seamless and easy from a consumer's need to purchase. However, the effortless experience should not mean buying over a need. Instead, targeting the market for real consumer needs would support consuming sustainably. (Lusina 2020)

Customers have the right to receive professional guidance and service so that their choices are targeted correctly. That would also make consuming sustainably possible.

Personalised pricing for sustainability?

In addition to interactivity, Business Finland claims that consumers also desire a personalised shopping experience. This means, for example, personalised product recommendations, customised marketing and search results corresponding to the customer's purchasing interests. It is speculated that personalised pricing is also one answer to solve the high return rate in online shopping: the less you return, the cheaper you can buy. According to Fashion Finland,

online store returns significantly burden the environment. For example, Zalando mails half a million packages daily and receives 250,000 returns (Fashion Finland 2022). This will certainly not solve the sustainability problem if the operating model happens to curb the number of returns. Still, it would mean that countless online purchases remain unused in consumers' wardrobes. The utopian ideal would be that together with targeted and personalised marketing; the consumer would end up purchasing products for real needs only.

In the Digiforum event organised by Finnish Textile & Fashion in June 2022, Digital Commerce Specialist Leevi Parsama stated that personalised pricing would improve the sustainability of the clothing store. According to Parsama, Zalando will eventually bring this operating model to its online store. However, despite the considerable number, Zalando's online store returns are not a problem. According to Parsama, returns "hurt the competitors more than them" because Zalando's concept is designed to handle such a constant flood of returns. Parsama also confirms the previously mentioned rule in the future online store, "the less you return, the cheaper you can buy". (Parsama 2022).

Picture 3. Digital fashion is forecasted to decrease the consumption of physical fashion by offering new ways for self-expression online. Immersiveness is one of the leading phenomena in fashion's digitality, which can be created with the help of technologies such as extended reality (XR). (Bogulov 2021)

The era of digital fashion—are we ready for the Metaverse?

Among the seven megatrends listed in VTT's 2022 Megatrends report, the second has been presented as the norm for the emerging future of the digital economy. Digital technologies are expected to accelerate new economic and industrial standards, affecting all parts of society. Technologies are expected to increase productivity, and data is assumed to be a key element in the digital economy. The most important aspect of the digital economy is who manages the data, technologies, and platforms, how secure they are and who decides what content is shown to us. (Kovanen et al. 2022).

According to Fashion Finland, the metaverse will serve as a key field in future trading trends. Towards the end of 2021, Facebook changed its name to Meta. Meta's vision is to build a metaverse, i.e. a seamless merging of digital and real life, with virtual reality tools at the centre. Realising the metaverse has been predicted to take years or even decades. However, the development may also be faster than anticipated. According to Facebook's statistics, 80 billion augmented reality-based operations per month are already performed with its tools. Such are, for example, filters that have gained tremendous popularity. If the metaverse continues as planned, Fashion Finland anticipates it will significantly change the trade by making virtual products and showrooms very quickly every day. (Fashion Finland 2022).

When purchasing moves from product-centricity to experientiality and through this also to engaging customers, the importance of digital dexterity is also emphasised. Digital design, for example, digital fashion, brings new opportunities for Generation Z and millennials to achieve a sense of novelty. (Dexigner 2019). The State of Fashion 2022 report states that fashion brands targeting young consumers should familiarise themselves with the possibilities of the metaverse and the gaming industry—for example, digital fashion and virtual clothes—as new forms of community building and commerce. Representatives of Generation Z spend a vast amount of time playing video games (Suomen Tekstiili ja Muoti 2021b).

The Digital & Sustainable Fashion Showroom project survey has revealed that the customer experience and immersiveness, i.e. experientiality, in shopping are at the centre of the consumers' and companies' interest. Companies compete for customers' attention in diverse ways. Of course, high-level customer service and an uncomplicated shopping experience are the critical elements of immersiveness. In fashion e-commerce, the customer's biggest challenge is knowing how to see the product while wearing it without being able to feel the fabric or try on the garment. How could the fit and quality of clothes be visualised in online sales other than with high-quality product images?

In the digital world, immersiveness can be created with the help of, among other things, extended reality (XR). This includes virtual reality (VR), augmented reality (AR), haptics, holograms and an ever-expanding

range of immersive tools that can enhance our senses. The result is a more intuitive relationship between reality and virtual worlds. (Hännikäinen 2022) Digital clothing or accessory try-on applications based on AR technology are already possible. Especially the luxury brands, such as Gucci and Louis Vuitton, have started to explore the potential of the 3D virtual fitting room through AR. The most familiar form of this technology is used in social media filters and works well for fitting accessories. However, for clothing, 3D design and technology is needed to fit clothes that take into account the unique shapes and movements of the human body.

Digital solutions to help with everyday business challenges

The possibilities of digitalisation have been explored in the Digital & Sustainable Fashion Showroom project in cooperation with three Finnish clothing and accessories companies during spring 2022. The aim was to map the companies' current state and produce a concept that offers a digital solution to a selected development target. The development process was structured using the Design Sprint method. Design Sprint is a workshop-like development method that proceeds step-by-step, typically over five days. The first step in the process is determining the company's operations' status, goals and challenges. Solutions are ideated for the selected challenge. Lastly, a prototype is built and tested by test users. (Fernandes 2016). The design sprint is known for its rapid progress; the solution is not left at an idea level when time is limited.

The cooperation companies were Dusty, Voglia and Vivokauppa. Dusty designs and manufactures avant-garde unisex clothing, Voglia is a fashion house known as a pioneer in sustainability, and Vivokauppa imports Vivobarefoot barefoot shoes. The Design Sprints were facilitated by KUUKI Technology Lab and the LAB University of Applied Sciences.

Dusty is a clothing brand formed around the *Dusty One* collection for rent and the *Dusty Forever* collection for purchase. Dusty's design is driven by sustainability and the freedom to express oneself uniquely. In the Design Sprint, which strengthened the brand's community, Dusty tribe was chosen as a challenge to tackle with a digital solution. The solution was a digital map application to which users could add a picture of themselves wearing a Dusty garment. The map shows and connects the application users globally and is a platform for self-expression and communication with like-minded Dusty tribe people. The longing for community is noticeable among consumers, and as a counterweight to digitality, automation and online shopping, customers still long for connection to others. Social media is changing rapidly, and for companies, it is challenging to keep up with this change. Such a separate application could be a long-term option for strengthening and growing the brand community.

In a brief time, Vivokauppa has established itself as a rapidly growing retailer of barefoot shoes in Finland. In addition to online shopping, the shoes are sold in Central

Picture 4. Design Sprint is an advanced workshop-like method used to map the challenges and rapidly ideate solutions in a limited time. The method aims to build a prototype around one selected challenge that is finally tested by test users. Quick ideating requires lots of post-it notes. (Picture: Mervi Koistinen)

and Southern Finland stores. As the COVID-19 pandemic accelerated in Finland at the beginning of 2020, Vivokauppa's online sales increased significantly. When there is a rapid flow of online purchases, there is a high rate of online returns—especially in footwear e-commerce.

The challenge has been the fragmentation of these complaints into many different channels. Here there is a risk that the customer's contact gets buried in different platforms and remains unanswered. In Vivokauppa's case, the smoothness of daily operations became more important than all the digital finesse and expensive possibilities in, for example, 3D fitting programs etc. To reduce returns and strengthen the customer experience in this kind of negative customer encounter, developing the product complaint process was chosen as a challenge to solve in the Design Sprint. During the sprint, the current complaint process was opened step by step. The result was an automated, easy-to-use complaint formula, including automatic email confirmations and guidance for the customer to proceed

Picture 5. Finnish brand Voglia is known as a pioneer in sustainability. Voglia participated in the the Digital & Sustainable Fashion Showroom project's Design Sprint to develop the growth of its online store and find digital tools to do so. (Voglia 2022)

with their complaint. This automated operating model maintains a good customer experience and helps the in-house complaint management process

Voglia's goal is to design durable clothes to age beautifully and last from generation to generation. Voglia strives to be a sustainable player in the clothing industry and is known for transparently communicating its supply chain management, from material selection to logistics. During the pandemic, Voglia's online store sales increased, and the current challenge was to express the quality and longevity of the clothing in e-commerce. Responsibly produced clothes are more expensive than cheaper-produced products such as fast fashion. The difference should be made understandable for the customer in the online store. The solution developed at Design Sprint was to support the growth of Voglia's online sales, so the result was a visualising tool for the online store to justify the quality and price to the customer. The tool calculates the cost of clothing per year of use and provides information on garment maintenance, which extends the garment's life.

References

Bogulov, V. 2021. Orange sport shoes. Unsplash. Cited 24 Aug 2022. Available at: https://unsplash.com/photos/rAKmYTWmXnk

De Luvio, C. 2018. Spending money on things we might not need. Unsplash. Cited 24 Aug, Available at: https://unsplash.com/photos/tcwNN4B9uWE

Dexigner. 2019. WGSN Reveals Future Trends for Design & Creativity at 2019 Next Design Perspectives Conference. Cited 13 Jan 2022. Available at: https://www.dexigner.com/news/32578

Fashion Finland. 2022. Tämän trendin muotiala on ottanut haltuunsa, mutta millainen on villein spekulaatio muotikaupasta – ja miksi personointi on tulevaisuuden sana? Cited 18 Jan 2022. Available at: https://fafi.fi/ilmoitukset/taman-trendin-muotiala-on-ottanut-haltuunsa-mutta-millainen-on-villein-spekulaatio-muotikaupasta-ja-miksi-personointi-on-tulevaisuuden-sana/?_thumbnail_id=21119

Fernandes, T. 2016. How Google Design Sprint Works. PM101. Medium. Cited 31 May 2022. Available at: https://medium.com/pm101/design-sprints-at-google-85ff62fed5f8

Fashion Finland. 2022. Kuka maksaa verkko ostoksen palautuksen — kauppias vai kuluttaja? Cited 21 Feb 2022. Available at: https://fafi.fi/ilmiot/kuka-maksaa-verkko-ostoksen-palautuksen-kauppias-vai-kuluttaja/

Hännikäinen, O. 2022. Step into the metaverse — Immersiiviset kokemukset rakentamassa tulevaisuuden verkkokauppaa. Presentation at the Finnish Textile & Fashion Digiforum, Helsinki, 15 June 2022.

Kovanen, K., Mäntylä, K., Stafford D. & Komonen, P. 2022. Megatrends report: Leading towards a better future. The 7 megatrends that will help decision-makers crystallise their direction for the upcoming decade. VTT Technical Research Centre of Finland Ltd. Cited 24 Aug 2022. Available at: https://info.vttresearch.com/hubfs/pdf/articles/2022-VTT-megatrends-report.pdf?hsLang=en

Lusina, A. 2020. Woman using smartphone for online shopping. Pexels. Cited 24 Aug. Available at: https://www.pexels.com/photo/woman-using-smartphone-for-online-shopping-6331230/

Muoti- ja urheilukauppa ry. 2022. Muotikaupan myötätuuli vaarassa hukkua koronan aaltoihin — urheilukauppa luistaa. Cited 9 Feb 2022. Available at: https://www.muotijaurheilukauppa.fi/2022/01/21/muotikaupan-myotatuuli-vaarassa-hukkua-koronan-aaltoihin-urheilukauppa-luistaa/

Parsama, Leevi. 2022. Digitaalinen kauppa — tulevaisuuden menestystekijät. Presentation at the Finnish Textile & Fashion Digiforum, Helsinki, 15 June 2022.

Suomen Tekstiili ja Muoti. 2021a. Tekstiilialan yritysten kasvu jatkuu, vaatealan tilanne epävarmempi. Cited 21 Feb 2022. Available at: https://www.stjm.fi/uutiset/tekstiilialan-yritysten-kasvu-jatkuu-vaatealan-tilanne-epavarmempi/

Suomen Tekstiili ja Muoti. 2021b. State of Fashion 2022: tuotantoketjujen ongelmat isoin uhka globaalin muotialan elpymisessä. Cited 21 Feb 2022. Available at: https://www.stjm.fi/uutiset/state-of-fashion-2022/

Suomen Tekstiili ja Muoti. 2022. Textile Fashion Forum Helsinki -juttusarja. Connected Retail suomalaisten vaatekauppojen kasvun vauhdittajana. Cited 22 June 2022. Available at: https://www.stjm.fi/uutiset/textile-fashion-forum-helsinki-juttusarja-connected-retail-suomalaisten-vaatekauppojen-kasvun-vauhdittajana/

Teerlinck, F.T. 2022. Virtual try-on at Louis Vuitton. Bootcamp. Cited 24 Aug 2022. Available at: https://bootcamp.uxdesign.cc/virtual-try-on-at-louis-vuitton-c8a9f6712dec

Voglia Oy. 2022. Voglia collection. Image bank of the Digital & Sustainable Fashion Showroom project at LAB University of Applied Sciences.

Helena Kalliomäki

The change of ownership in the textile and fashion sector — PaaS, Product as a Service pilots

Abstract

The global process of ecological, economic and societal change is influencing the transformation of the textile and fashion sector, where linear business-as-usual and sustainable circular economy are at the water's edge. The most remarkable driver of change is undoubtedly the megatrend of climate change, which should be the primary driver to control the reckless waste of natural resources in the context of producing and consuming goods. The circular economy and sustainable business are seen as the solution to tackling this alarming trend. The Product as a Service model is at the heart of the circular economy, alongside materials recycling and reducing consumption. Increasing the number of uses and extending the life cycle of products such as textiles and clothing can significantly contribute to sustainability and a sustainable future. The most environmentally friendly product is the one that can be used for as long as possible.

The article examines the principles of the Product as a Service model (later PaaS) and argues for the vital shift from owning goods to rental services, especially in the textile and fashion sector. It also discusses how design thinking can contribute to a shift towards new circular economy business models. Using examples from the piloting of the PaaS, Product as a Service research project, the article outlines how transformation can be designed and the challenges and opportunities that implementing new business models provides to businesses.

Keywords: Product as a Service, change of ownership, circular economy, sustainable business, design thinking, textile and fashion industry

Introduction PaaS, Product as a Service pilots research project

The PaaS Pilots project aimed to map the challenges and opportunities of PaaS models in the textile and fashion sector and the added value of service concepts, both for the consumer and the service provider. The project piloted novel PaaS business concepts with partner companies operating in the B2B and B2C segments, and piloting was carried out in their operative environments. As a conclusion of the study and the PaaS Pilots project, a guide was published which provides background on the PaaS model from sustainable business, consumption and environmental impact perspectives. In addition, the guide introduces a scalable service developer path: useful tips, and tools for companies in general, regardless of the operative domain. (Heinonen et al. 2022).

The Finnish Innovation Fund Sitra funded the research project and implemented it with the Turku University of Applied Sciences in cooperation with the VTT Technical Research Centre of Finland and the LAB University of Applied Sciences.

Product as a Service model — what is it?

PaaS is a fundamental circular economy approach to reuse and distribute products, which aims to increase the use efficiency and extend the product life cycle. The products and associated services form PaaS concepts. Servitization is a growing model of business that reduces the use of natural resources and supports the transition towards a carbon-neutral society. (Valtioneuvosto 2021, 26).

In the circular economy, recycling involves much more than the treatment of disposed materials or products by recycling. The context essentially involves the business of sharing products, which allows us to talk about the change of ownership. In the circular economy, five different models can be distinguished based on the circulation of materials and products: **Product as a Service, renewability, sharing platforms, product-life extension, resource efficiency and recycling**. The definition is completed by business models for producer ownership, defined in terms of materials and products: **Product as a Service, materials as a service, performance as a service and function guarantee.** Business models are supported by and operate through various digital service platforms. (Orasmaa et al. 2020, 11–12).

Petänen (2022, 7) sums up that the PaaS model aims to manufacture products in the most material and cost-efficient way possible, offering socially and environmentally sustainable solutions. The PaaS concept offers the customer the desired outcome instead of ownership. Products are offered to customers as a service, where the customer redeems the right to use them by renting or leasing on a one-off basis or for the desired period. The service provider retains ownership of the product and its materials, freeing the customer from needing storage and maintenance. When products are shared and reused, the materials and products are more efficiently used, and environmental

benefits are increased. (Botsman & Rogers 2013, 72). In addition to recycling and reducing consumption, the reuse of products is a core activity of the circular economy. Extending the life cycle of a product through maintenance, repair and customising is also an essential part of PaaS models. (Orasmaa et al. 2020, 11).

The textile and clothing industry has a long experience with PaaS models, especially in the workwear, hygiene and accommodation sectors. Workwear leasing and maintenance services are already a well-known model, providing functional and maintained workwear suitable for the desired task. (Kalliomäki 2021, 42). Clothing as a service model for everyday clothing is still waiting to become mainstream. Still, the available and new, developing service concepts create increasingly attractive and customer-friendly ways to reduce consumption.

According to the Finnish Textile & Fashion Association's Carbon Neutral Textile Roadmap, the sector believes in the potential of the PaaS business models. Companies are believed to be willing to implement PaaS models, for example, alongside linear businesses in their operative domain. This is conditional on consumer engagement with services and making service concepts commercially viable. From a consumer perspective, apart from the value-based attitudes related to ownership, one of the most significant challenges in PaaS models is the cost of services relative to the new products offered, especially for repair and maintenance services. (Heino et al. 2020, 60).

Why Product as a Service model?

With climate change and the alarming loss of biodiversity at the forefront of public debate, it is worrying that according to the Circularity Gab report (Circle Economy 2022, 25), only 8.6% of the world economy operates according to circular economy principles! The global textile sector is one of the largest producers of greenhouse gas emissions from global industry. Clothing represents 60% of all textiles used and produced. In addition to the social, societal and environmental harms caused by production, the challenge is specifically the growing amount of textile waste, the recovery and recycling of which is not yet sufficiently managed. (Ellen MacArthur Foundation 2017, 18).

Even though several sustainable development initiatives have been taken, unfortunately, many solutions have so far been carbon footprint compensatory measures and do not address the source of the problem. According to the principles of the circular economy, the production and consumption of clothing and textiles should simply be reduced. The aim should be to increase product usage, thus preserving the value of the materials in the cycle while reducing textile waste. (Niinimäki 2018, 34). The mainstreaming of circular economy solutions, such as PaaS models, are an essential part of a new sustainable approach.

In a volatile and confusing environment, the consumer and the fashion industry are looking for agility, flexibility and resilience. For example, the second-hand phenomenon, strongly linked to product distribution

and reuse, is expected to grow among consumers and brand offerings. Consumers are increasingly aware of the importance of sustainable consumption, and novel business models related to PaaS models are becoming more mainstream. Shifting from ownership to the use of services reinforces a sense of quality, security and permanence. Sustainability as a concept essentially underpins timelessness and contributes to the transition away from fast fashion. Growing demand for sustainable consumption is seen as the most important factor driving consumer behaviour and industry activity. (Korkman & Greene 2022, 10–13). The pursuit of quality is strongly linked to the change in ownership, which is seen as an emerging trend in the future. According to the WGSN forecast, consumers will value and seek experiences rather than ownership. PaaS solutions will provide access to products without the need to own them and will support consumers' efforts to reduce purchasing goods. (Dexigner 2019).

Embracing digitalisation and technological development is crucial for sustainable business. Advanced solutions will dramatically change consumer behaviour, enabling an increasingly sustainable and customer-centric way of producing and consuming clothes and textiles. Personalised e-commerce, 3D technologies, virtual fitting and even fully digital garments will generate a more sustainable and environmentally friendly dress context for both the consumer and the fashion industry in the future. (Korkman & Greene 2022, 15).

How to design the transformation?

Design thinking or service design thinking

Circular economy business models should balance economic, environmental, and social factors, as the Sustainable Development Goals require. In addition to the sustainability aspect, the development of service concepts must, in addition to the potential business idea, carefully define the added value that the service should offer customers. The service's price, convenience and reliability are essential from the customer's perspective. (Orasmaa et al. 2020, 32). Business in the circular economy is increasingly based on providing services and service concepts instead of trading products. A successful service concept is functional, and the product offered as a service is desirable. Developing a PaaS concept that is commercially viable and value-adding requires a solution-oriented, holistic, empathetic and user-centred approach based on design thinking. (Brown 2019, 10).

When developing PaaS concepts, service design processes are worth using, such as the Double Diamond process, which benefits divergent and convergent perspectives to gather contextual understanding and develop solutions. The process is iterative and consists of discover, define, develop and deliver phases. A variety of tools and templates can be used to transform design services into usable and desirable concepts. (Design Council 2015). Service design draws heavily on design thinking: *as a mindset,*

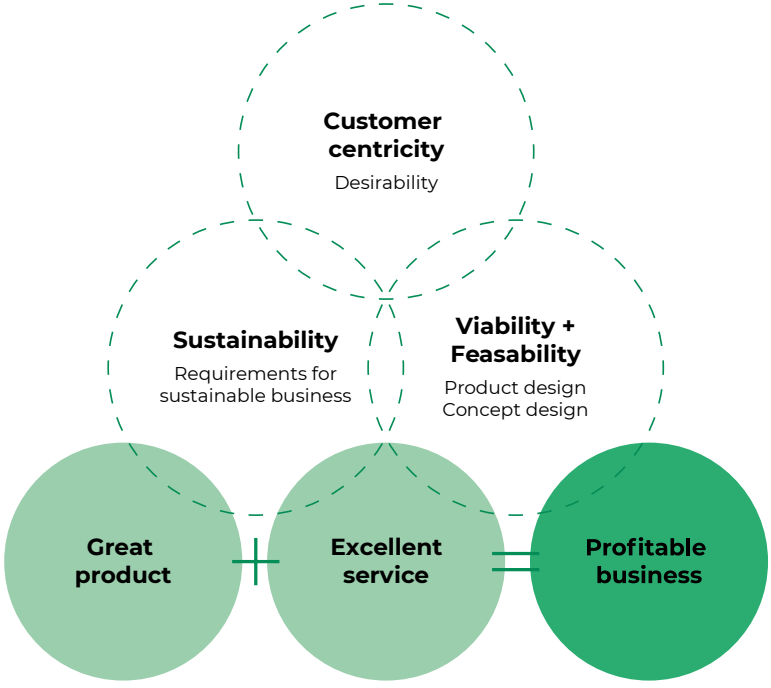


Figure 1. The approach should be user-centred and holistic, based on design thinking principles and service design, to achieve a profitable and sustainable PaaS concept. (Figure: Helena Kalliomäki, Mervi Koistinen)

service design is pragmatic, co-creative and hands-on. It looks for a balance between technological opportunity, human need and business relevance (Stickdorn et al. 2018, 21).

Sustainable design requires considering aspects related to aesthetics, usability and user experience. Designing products to perform well in service concepts requires considering not only the durability of structures and materials but also the maintainability and adaptability of products. According to the Ellen MacArthur Foundation, up to 80% of solutions affecting product longevity, adaptability and proper recyclability can be generated at the designer's desk. In addition to sustainable product design, strategic solutions should be developed to create strong market and brand value, especially in concepts where one product can have multiple users. The demand for repair, maintenance and customisation services that extend the product lifecycle will undoubtedly increase

as PaaS models become more mainstream. According to Niinimäki (2018, 33), exploring what kind of scalable solutions and profitable businesses can be designed and developed in this sector would be essential.

Piloting Product as a Service concept — Workwear as a Service Case

The PaaS project mapped the challenges, opportunities and added value of the novel business model. The data was gathered by piloting rental service concepts in collaboration with companies in the B2B and B2C sectors. The Workwear as a Service pilot tested an existing concept, and the Casual wear as a Service pilot developed a completely new rental concept for a company offering casual wear products. The following will discuss the design process and implementation of the Workwear as a Service pilot.

The Workwear as a Service pilot was carried out in cooperation with the LAB University of Applied Sciences and a domestic company in the workwear sector. Currently, the company operates mainly in the linear manufacturing and retailing of workwear and accessories but has developed a rental concept with the aim of increasing its rental business with selected customer segments. In order to make the rental concept a viable business in the future, it was tested, refined and developed through piloting.

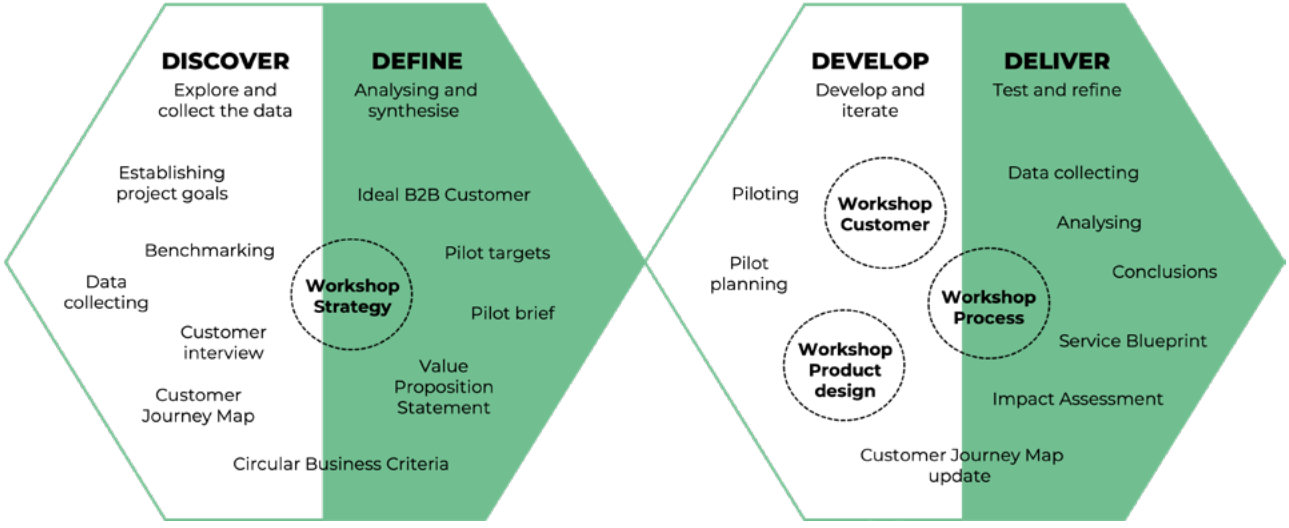


Figure 2. Workwear as a Service pilot design process plan visualised with Double Diamond figure (Figure: Helena Kalliomäki, Mervi Koistinen)

In outlining the action plan, the following aspects emerged as essential questions:

- **Who are the ideal customers for the rental concept?**
- **What are their needs?**
- **What kind of service are customers willing to pay for?**
- **How to respond to customers' needs and expectations within a rental concept?**

The fundamental questions were answered by applying the holistic approach of design thinking and the core approach of service design, the Double Diamond process, and tools to collect the necessary information about the customer, user and the process (Kalliomäki 2022, 32–33). The Double Diamond process was used to outline and structure the essential elements required for data collection and the process design and implementation of the pilot. As the pilot progressed and information increased, the iterative nature of the process allowed us to return to the starting point and examine the concept from a new perspective (Chart 2).

The focus of the Workwear as a Service pilot was to test the current rental concept with selected customers, collect data on the phases of the process and exploit this data for further development. Three main objectives were set for the company's rental concept:

1. **Refine the current concept and process,**
2. **Find out how the rental concept generates a profitable business, and**
3. **Increase customer engagement and added value.**

In addition, rental concept brand designing and targeted marketing need special consideration in terms of customer embracement for renting instead of owning (Kalliomäki 2022, 34).

The pilot's design focused on the product's customer and end-user, the functionality of the rental process and the products to be rented. Before designing the pilot, it was essential to define what kind of data was needed and how it would be collected—data collecting consisted of market benchmarking, team discussions, stakeholder interviews and customer interviews.

The pilot agenda was divided into supportive workshops, which each assisted in figuring out the gains and pains of the concept and process and brightening the focus. Circular business criteria were focused on by considering the issue from the company's point of view, from the customer's side and the net impact in terms of social and environmental aspects. In addition, the Customer Journey Map, Ideal Customer Profile, Value Proposition Statement, and rental process update were defined in several co-design workshops during the pilot. (Kalliomäki 2022, 34).

Mapping the interactive customer steps before, during and after the rental process was an important task to compose before the pilot. The core team framed a provisional Customer Journey Map according to the data and experience the company already

had from the concept frame. The Customer Journey Map was tested and updated with the customers during the pilot.

Value Proposition Statements were framed by mapping the Ideal B2B customer profile and customer needs, values and problems to be solved. When defining value statements, it is crucial to recognise and consider the customers' *job's to be done* to find out the way to solve them. In addition, discussing the gains and pains in the current concept and reflecting them in the customer needs and interactive steps during the rental process led to finding solutions on how to update the concept to benefit both the company and the customer.

The product development workshop involved both the company product development team and the test customers in the pilot, using the design thinking process to examine the rental concept from the perspectives of the customer and the end user, product rentability and sustainability requirements. The workshop brainstormed solutions based on user experience to develop operation models that, on the one hand, increase customer satisfaction and engagement in the rental business and, on the other hand, enhance the company's sustainable product design.

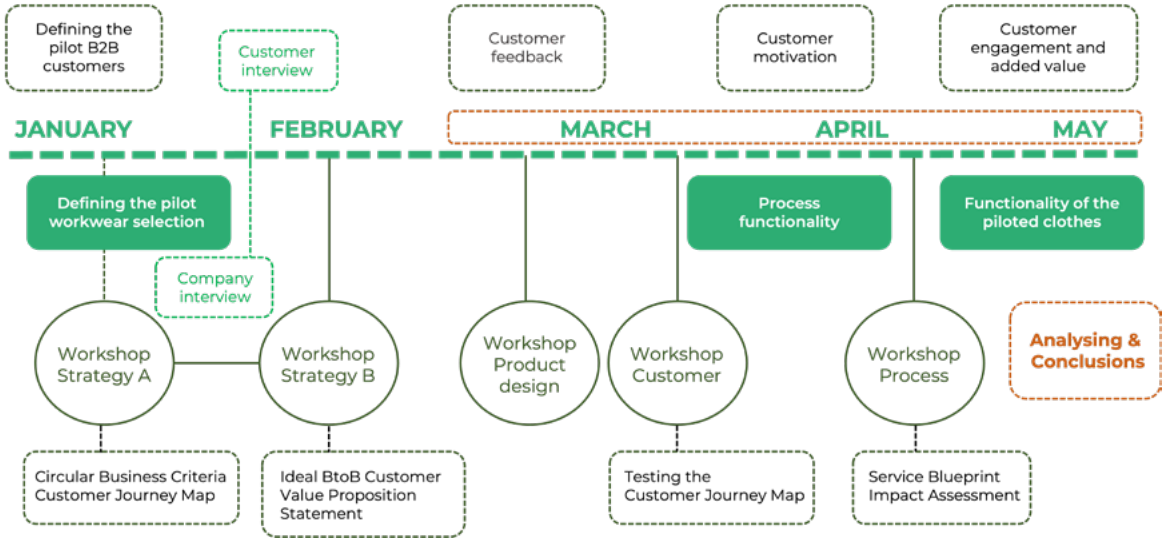


Figure 3. Workwear as a Service piloting timeline and main activities (Figure: Heinonen et al. 2022, 35, modified by Mervi Koistinen)

The concept was tested with selected B2B customers. After piloting, the collected data and feedback were analysed, considering customer feedback and rental process workability in a co-design workshop with all the involved pilot teams. A Service Model Blueprint template was availed to map out systems, processes, content and capabilities needed to launch the concept. (Kalliomäki 2022, 34).

Piloting conclusions

The piloting of the rental concepts aimed to identify the challenges and opportunities of the PaaS model and the activity's added value. Based on the workshops, interviews and piloting, the main themes that emerged were:

- **accessibility and access to products**
- **product distribution**
- **product range**
- **process and stakeholders**
- **environmental benefits and sustainability**

For the consumer and the product end-user, the transition away from ownership is dual. The challenge of product sharing can be highlighted by the cost of the service in relation to the market offer, especially for garments worn daily. On the other hand, distribution gives access to rare and more expensive products, making the financial benefit an important motivator to use the service. The sustainable consumption associated with product sharing can be seen as a driver of motivation, and the approach is also perceived as fostering a sense of community. Issues of self-expression and identity related to clothing may be highlighted when choosing between PaaS models and product ownership, and attitudes towards new models may be slow to change. Pricing and reliability of maintenance and repair services, for example, concerning hygiene issues, may also be critical for consumers.

In the B2B sector, the product end-user does not usually choose the products themselves. Therefore, the service price or value-based ownership questions are not an issue, nor is product sharing or the reliability aspect of product maintenance. In the B2B sector, rental services reduce the need for investment by the client company; therefore, the price of the service is not considered critical. In addition, distribution minimises the customer's risk and storage needs, bringing flexibility, convenience and access to use the required products at an appropriate time.

Choosing the appropriate product range is critical to adopting and using the PaaS model. The style of dress and consumers' needs in terms of usage determine the choice between purchasing and benefitting from a rental service. For the B2B customer, the functionality and suitability of the products in the rental service's range for the function in question are the most critical selection criteria. Ideally, the rental product also supports the customer's brand. It is essential for the service provider to receive feedback from customers on the products and the functionality of the range so that

they can adapt and update the offering to meet their customers' needs. The challenge may be to assemble a product range to meet the requirements of multiple users. Critical issues in this point of view for clothing are sizing and the requirement for maintainability and longevity.

The PaaS model must be an easy and flexible way for customers to access the products. This is why the partners and stakeholders are critical to a smooth rental process, especially maintenance, repair and logistics. In order to provide even more customised services, the concept can be combined with several other elements, such as customer consultation and curation, product take-back services, product validation and lifecycle optimisation, e.g. Recycling as a Service.

As a result of the Workwear as a Service pilot, it can be concluded that the smooth progress of the process is the most critical step in the whole process, as it affects both the service provider's performance and the consumer's experience of the service. Circular economy approaches are often integrated into companies alongside a linear business model because the commercial criteria may not be met at the outset. This requires adapting internal processes and ERP systems to support the new approach. Success also requires strategic commitment and appropriate as well as transparent marketing.

From an environmental perspective, the PaaS model is mainly perceived as a sustainable solution in both the B2B and B2C sectors, but the importance of sustainability varies between customer groups. For consumer customers, environmental considerations are not necessarily the most important criteria for choosing the PaaS model. On the other hand, it was perceived as a decisive motivating factor to increase sustainable consumption. The need to act sustainably was also highlighted for business customers. The business customers who tested the pilot indicated that sustainable development was linked to their core values and felt pressure from the market to provide sustainable solutions. A strong environmental motivation for choosing a rental service is reducing textile waste treatment in the B2B customers' business. The benefits for the service provider include a reduction in the number of products produced in the long term and an increasing the use of products. By operating a circular economy business, the service provider can manage the materials it uses, the take-back and reuse of products and the recycling of discarded textiles.

Although the Product as a Service model is categorically considered an environmentally friendly activity, the shared product's emissions can be higher than those used individually. While the PaaS model increases the utilisation rate of products, it also increases the activities required to distribute the product, such as storage, mobile and logistics services and product maintenance. The sustainability and environmental impact of PaaS models can be assessed through life cycle assessment (LCA), which covers the life cycle of a product from raw materials to disposal. During the pilot, it was commented

that LCA is challenging and expensive to implement. Also, according to Hokkanen (2022, 18), the results of LCA measurements are dependent on several variables and based on assumptions. Therefore, instead of looking at the emissions of a single product, the PaaS model should be considered from the perspective of the active use of the products. In addition, it should be noted that servitisation leads to a substantial reduction in the consumption of raw materials and the amount of waste generated.

For the service provider, the Product as a Service model provides new potential for a sustainable approach to business. As the concepts develop and become mainstream, economic viability will also become more established. The novel service models offer attractive options for consumers to increase sustainable consumption and reduce overall consumption. More research and testing will be needed on emerging novel circular business models and their impact on our environment!

References

Botsman, R. & Rogers, R. 2011. What´s mine is yours. How collaborative consumption is changing the way we live. London: Harper Collins Publishers.

Brown, T. 2019. Change by Design, Revised and Updated. How Design Thinking Transforms Organisations and Inspires Innovation. New York: Harper Collins Publishers.

Circle Economy. 2022. Circularity gap report. Cited 29 Aug 2022. Available at https://www.circularity-gap.world/2022#Download-the-report

Design Council. 2015. Design methods for developing services. An introduction to service design and selection of service design tools. Cited 29 Aug 2022. Available at https://www.designcouncil.org.uk/our-work/skills-learning/resources/design-methods-developing-services/

Dexigner. 2019. WGSN Reveals Future Trends for Design & Creativity at 2019 Next Design Perspectives Conference. Cited 29 Aug 2022. Available at https://www.dexigner.com/news/32578

Ellen MacArthur Foundation. Recycling and the circular economy: what's the difference? Cited 10 Nov 2022. Available at https://ellenmacarthurfoundation.org/articles/recycling-and-the-circular-economy-whats-the-difference
Ellen MacArthur Foundation. 2017. A new textiles economy: Redesigning fashion's future. Cited 19 Aug 2022. Available at https://ellenmacarthurfoundation.org/a-new-textiles-economy

Heino, A., Markkula, A., Saario, M., Sihvonen, H., Ylimäki, L., Kamaja, M., Mikkonen, H. & Mäki, S. 2020. Hiilineutraali tekstiilialan tiekartta. Loppuraportti. Gaia Group Oy. Cited 28 Aug 2022. Available at https://stjm.s3.eu-west-1.amazonaws.com/uploads/20200610133352/STJM-Hiili-neutraali-tekstiiliala-tiekartta_FINAL.pdf

Heinonen, E., Kalliomäki, H., Petänen, P., Hokkanen, M., Heikkilä, J., Mäkiö, I., Antikainen, M., Nurmi, P. & Virta, M. Guide for developing Product as Service business. Turku: Turku University of Applied Sciences. Reports from Turku University of Applied Sciences 291. 17-18. Cited 31 Aug 2022. Available at https://urn.fi/URN:ISBN:978-952-216-820-7

Hokkanen, M. 2022. Environmental viewpoints for developing a PaaS model. In Heinonen, E., Kalliomäki, H., Petänen, P., Hokkanen, M., Heikkilä, J., Mäkiö, I., Antikainen, M., Nurmi, P. & Virta, M. Guide for developing Product as Service business. Turku: Turku University of Applied Sciences. Reports from Turku University of Applied Sciences 291. 17-18. Cited 31 Aug 2022. Available at https://urn.fi/URN:ISBN:978-952-216-820-7

Kalliomäki, H. 2022. Workwear as a Service – Case Image Wear. In Heinonen, E., Kalliomäki, H., Petänen, P., Hokkanen, M., Heikkilä, J., Mäkiö, I., Antikainen, M., Nurmi, P. & Virta, M. Guide for developing Product as Service business. Turku: Turku University of Applied Sciences. Reports from Turku University of Applied Sciences 291. 17-18. Cited 31 Aug 2022. Available at https://urn.fi/URN:ISBN:978-952-216-820-7

Kalliomäki, P. 2021. Vaate palveluna: muuttuvien osaamistarpeiden ennakointi muoti-ja vaatetusalalla. YAMK-opinnäytetyö. LAB-ammattikorkeakoulu, Muotoilu- ja media-alan uudistava osaaminen. Lahti. Cited 1 Sep 2022. Available at https://urn.fi/URN:NBN:fi:amk-2021082717197

Korkman, O. & Greene, S. 2022. Business Finland. International growth of Finnish BeC fashion. Bottlenecks and needed action. Business Finland. Report 1/2022. Cited 29 Aug 2022. Available at https://www.stjm.fi/wp-content/uploads/2022/02/31849498_BF_Bottlenecks_and_needed_action_B2C_Fashion_22_01_14-v3.pdf

Niinimäki, K. 2018. Sustainable Fashion in a Circular Economy. In Niinimäki, K. (ed.) Sustainable Fashion in a Circular Economy. Espoo: Aalto Art Books.12–42.

Orasmaa, A., Laurila, L. & Liimatainen, H. 2020. Rethinking ownership. Producer ownership models in a circular economy. Helsinki: Sitra. Sitra studies 176. Cited 19 Aug 2022. Available at https://www.sitra.fi/app/uploads/2020/12/rethinking-ownership.pdf

Petänen, P. 2022. What are the Product as a Service models? In Heinonen, E., Kalliomäki, H., Petänen, P., Hokkanen, M., Heikkilä, J., Mäkiö, I., Antikainen, M., Nurmi, P. & Virta, M. Guide for developing Product as Service business. Turku: Turku University of Applied Sciences. Reports from Turku University of Applied Sciences 291. 17-18. Cited 31 Aug 2022. Available at https://urn.fi/URN:ISBN:978-952-216-820-7

Stickdorn, M., Hormess, M. E., Lawrence, A., & Schneider, J. 2018. This is service design doing: applying service design thinking in the real world. A practitioners' handbook. Canada: O'Reilly Media, Inc.

Valtioneuvosto. 2020. Uusi suunta: Ehdotus kiertotalouden strategiseksi ohjelmaksi. Helsinki: Valtioneuvosto. Valtioneuvoston julkaisuja 2021:1. Cited 1 Sep 2022. Available at http://urn.fi/URN:ISBN:978-952-383-658-7

Mervi Koistinen & Paula Nurminen

A substitute for plastic-based materials is hanging by a hair

Abstract

Hair waste is not currently recycled or further processed comprehensively. Upcycling hair waste requires research, product development and building an ecosystem from waste recycling to selling and using final products. Developing new materials and replacing plastic-based products with organic solutions can help decelerate the climate crisis. The Hiukka 2.0 project aims to study the possibilities of hair material in replacing plastic-based materials and share knowledge about creating businesses in accordance with the principles of the circular economy.

The goal of developing the Hiukka ecosystem is to create a sustainable business from hair material. As part of the Hiukka 2.0 project, a training pilot for sustainable business is developed, which will help existing and future Hiukka partners increase their understanding and know-how about circular economy and upcycling hair waste. The training pilot will focus on the Päijät-Häme region but will be partly available for national partners.

Keywords: Circular economy, hair fibre, upcycling, oil spill, education, ecosystem, new business

From waste to a recycled by-product

According to the Hiukka Hyvä project's calculations (2022), about 450,000 kg of hair waste is produced annually in Finland. Hair is an organic material, but it decomposes slowly. It is known to absorb water, chemicals and oils many times its weight. Hair has already been used worldwide in oil accidents, for example, in Mauritius in 2020 and Peru in 2022. Furthermore, hair fibre is being studied to an increasing extent.

In Lahti, the upcycling of hair fibres into a material was started in 2021 by the *Hiukka Hyvä environmental project* and the LAB University of Applied Sciences. The Hiukka Hyvä project began mapping the possibilities of recycling organic fibres into new material and acquired a felting machine suitable for hair fibres from the Matter of Trust organisation in the United States. Human hair can be combined with other organic fibres, such as wool or dog hair. Hiukka Hyvä started

Picture 1. Hair material (Picture: Mervi Koistinen)

networking with hair salons across Finland to collect hair waste for recycling.

In the LAB University of Applied Sciences, the development of a hair material continues in the *Hiukka 2.0—Hair and other organic fibres as a substitute for plastic* project. The goal of the project is to develop further processing of organic fibres in cooperation with hair and grooming salons and the Hiukka Hyvä environmental project. The focus in development is using hair in oil spills, green building and water purification. The goal is to find new solutions to plastic-based products in these markets. The project will last until September 2023. The Regional Council of Päijät-Häme funds the project.

Dog hair against EU legislation

The development of animal by-products must consider the relevant legislation. European Union by-product legislation regulates the use of animal by-products and derived products (EU 2011). The Finnish Food Authority supervises compliance with the regulation in Finland. Human hair is not considered an animal by-product; therefore, no authorities oversee its use.

According to the Finnish Food Authority's

guidelines using sheep's wool is possible if treated following the instructions given in the by-product legislation. One way is to store the wool at a specific temperature for a certain number of days. However, dog hair is not allowed to be upcycled at all. Dog hair belongs to a by-product category whose guidelines state that it has to be disposed of by incineration (Torniainen 2021).

EU by-product legislation affected the Hiukka 2.0 product development, as the material contained human hair, dog hair and wool. The combination of different fibres resulted in better felting and other technical properties. Fortunately, the legislation was discussed in the EU subdivision during the spring of 2022, and since then, using dog hair like sheep's wool has been allowed in Finland. Dog hair availability is better than human hair, so producing hair products can be more reliable (Nurminen 2022).

Cleaning oil spills with hair materials

The latest example of using hair in an oil accident is from January 2022, when after a massive oil spill off the coast of Peru, the country's residents participated in the clean-up work by donating human, dog and llama hair to make absorbent booms. (Samon 2022).

An Australian oil spill study (Pagnucco & Phillips 2018) found that, on average, a boom made from hair waste binds crude oil better than a boom made from polypropylene, cotton by-products or recycled cellulose. However, the hair boom had the worst buoyancy in seawater and bound the oil unevenly.

Product development for oil spill products is one focus point in the Hiukka 2.0 project. During the autumn of 2021, the design students at the LAB University of Applied Sciences prototyped different tools for oil spills as part of a product design course. The selected prototypes were tested at Kotka's oil spill response test basin in spring 2022. The research problem for the first test was how well hair material absorbs different oil types from water and if the oil can be drained from the hair material in between absorptions. The South-Eastern Finland University of Applied Sciences (Xamk) operates the oil spill facility. User testing was carried out together with WWF´s voluntary oil response forces after the first test day.

The first test was done in a smaller water tank where oil was poured into it. When cleaning an oil spill, it is crucial to wear adequate safety equipment, so the testing is done as if it was an actual oil spill. The oil spill experts in Xamk have developed a mangle that can drain oil from the products after absorption. The mangle removed oil from the hair material effectively. Using the mangle makes it effortless to drain heavy, wet hair material. Draining the material between uses enables the product to be used multiple times. In the first test, there were different combinations of organic materials and different shapes and sizes of prototypes.

As a result of the test day, the combination of human and dog hair was found to be the most effective. The hair material's oil absorption was better with heavier oil types such as crude oil. Hair material also absorbs water, but water can be easily drained out. It

was promising that many rounds of absorption and draining didn't affect the quality of the hair material or its effectiveness. The material appears to be long-lasting, holding up well to repeated use. The testing initiated the direction for the shape and size of the final products. Easy handling during use and the cost-effective manufacturing process should be considered when developing the prototypes further.

The feedback on hair material was great in the user testing with the WWF Oil spill troops. The volunteers tested the prototypes by cleaning oil from water, sand and stones. At the same time, they compared the hair-made prototypes with the products in the marketplace. Most of the volunteers had no previous experience with an oil spill. They experienced that the oil absorption capability of the hair material was as good as plastic products. Because the mangle was not used during the user testing, we found draining the wet hair material by hand quite heavy. The hair material also released some fibres during usage. Furthermore, excellent development ideas were received.

Picture 2. Cleaning oil from water using hair material with the WWF Oil spill troops (Picture: Mervi Koistinen)

Hair material provides plants with humus soil and nutrients to grow

There are examples of hair material used in plant culture (Photo 3). It's been studied that hair contains a high level of nitrogen, which could be beneficial in agriculture (Zheljazkov et al. 2008). In order to release nitrogen, hair fibres must start decomposing, which can slow down the release. Also, hair fibres retain water, which helps keep the soil moist and reduces the need for watering (Fonseca 2021). Hair material could be used for plants and trees as a surface layer on the ground to prevent weed growth and protect roots from dryness. Hair material could be a local and ecological replacement for wood chips and plastic-based or coconut-based filter and cover materials in the marketplace.

In Finland, using waste in land construction is regulated by government decree. The legislation aims to promote the utilisation of waste in land construction. The so-called MARA Decree specifies that the use of certain wastes in land construction does not require an environmental permit if certain conditions are met (Decree 843/2017). For

Picture 3. In Chile, hair material is used for plants to combat the effects of drought. (Matter of Trust Chile 2022)

hair material, heavy metal concentration in hair fibres must be researched before using it for land construction. A bachelor thesis student is tackling this research in the Faculty of Technology at the LAB University of Applied Sciences. The research is operated in the LAB Circular Laboratory with the help of LUT University.

In this case, hair material needs to be tested further before green building (or land construction) productisation. During the Hiukka 2.0 project, more practical testing will be carried out. The city of Lahti is building a campus park near the LAB campus. Hair material will be used as a top layer instead of wood chips for a selected planted area. The campus park will be built in 2022–2023.

Hair material could be useful as an underlayer for green roofs. According to a green roof manufacturer cooperating with the Hiukka 2.0 project, plastic underlayers are now used in green roofs. The companies are seeking alternative and ecological solutions. Hair material testing for green roofs is planned to be done during the fall and winter of 2022–2023.

Circular economy training pilot

The Hiukka 2.0 project organises a circular economy training pilot for hairdressing and grooming salons to tighten the use of human and dog hair in the future as part of the business of these industries. At the same time, awareness of the project and hair material, which is the project's development target, is increased. The training aims to familiarise with the business principles in accordance with the new circular economy in these sectors and thus create new business activities when the human and dog hair material that is currently going to waste is utilised for new products.

The subjects of the training are the circular economy and the cornerstones of sustainable business. Circular economy-based businesses are made familiar by going through the circular economy's drivers, principles and resource wisdom. Participants will become familiar with various business models and value chains, planning, design methods and possibilities according to the circular economy. The training also provides a basis for building a sustainable and responsible brand. In training, participants also learn about the role of logistics in the circular economy, such as a sustainable supply chain, recycling, material and information flows and networks. Logistics challenges are reviewed in building functional logistics related to the human and dog hair industry. Material flows, availability and benefits for the environment and companies are evaluated through examples from the target sectors. As a group work and with the help of co-design methods, training goes through the process of developing each business according to the circular economy.

On the second day of the training, the participants get to see their own company's outlook as part of a circular economy business. After a short topic introduction, everyone has their own sales and marketing clinic time, where together with their coach, they see how sales and marketing can reinforce

each other concerning the participant's own business. During the second day, the participants will make human hair and dog hair jewellery as an example of a viable new business in line with the circular economy. The marketing and sales training part is implemented together with the JATKO project.

New hair-based circular economy ecosystem

The Hiukka ecosystem now includes *hair fairies*, hairdressers who collect hair and send it to Hiukka Hyvä's workshop as material. Groomers, called *dog hair godmothers*, have not been able to take on as many yet because, at the moment, the material is sent in shipping bags, and there is so much more dog hair than human hair currently being collected and received. Posti has been involved in supporting Hiukka Hyvä's development work by donating stamps for shipments. The hair shipping bag was designed as part of a thesis at the LAB University of Applied Sciences. The ecosystem also includes regional collectors, places where hair is collectively gathered by province. Hiukka Hyvä currently collects hair from over a hundred hair salons around Finland. Several enthusiastic groomers are becoming collectors, but dog hair needs to think about its own logistics chain, and its development is still in progress. It is one of the processes currently under development for the Hiukka 2.0 project.

Around Hiukka-material, a strong Paijät-Häme community is emerging, contributing to the creation of new businesses which can be used to create and develop cooperation in the human and dog hair business. Hiukka-material is only manufactured in the Lahti area in Finland. The future plan includes Hiukka Hyvä's regional collectors having felting machines so that Hiukka mat could be produced in other provinces, not just Lahti. In this way, delivery journeys and the spread of products would improve considerably and, at the same time, support a business model in line with the circular economy.

The future

Based on the background research and product development carried out in the Hiukka 2.0 project, it can be concluded that human and dog hair are a resource that is currently unused. It has also been shown that human and dog hair have excellent properties that should not be left unutilised. Research and development on this topic are indeed worth continuing. In cooperation with the LAB University of Applied Sciences' Design for Sustainable Business growth platform, new human and dog hair projects are being developed. The new value chains and applications of Hiukka-materials require further research and continuous monitoring, as the topic is also developing rapidly worldwide.

As part of a master's level exchange internship in the Hiukka 2.0 project, Reutlingen University student Babette Sperling compiled extensive background research material on the possibilities of using hair and current research. The data can be used when planning future projects and cooperation. Several dozen new applications have

Picture 4. Hair jewellery workshop was organized in the Hiukka 2.0 project. (Picture: Mervi Koistinen)

already been found for hair, such as support material for 3D printing, fertiliser, surgical thread, composite fibre material, formaldehyde filter and, for example, strong and weather-resistant ropes. The intern became excited about hair research and will do her own Textile Chain Research master's thesis at the University of Reutlingen on hair. Our cooperation will also continue in connection with that work.

The future is covered in hair. Human hair is an inexhaustible natural resource; dog hair is good and currently unused to increase the supply. If you peek a little through that mass of hair, you can see a wonderful new business created from this unique material with multiple possibilities. Although hair alone is not produced as much in Finland as in the rest of the world, developing this new circular economy business is still good. Finland is the right size country for creating and testing new innovations and value chains. Exporting a new circular economy business to the rest of the world after development and testing in Finland is also an excellent and remarkable business opportunity.

References

EU 2011. Euroopan Unionin Virallinen lehti: Asetus (EU) No 142/2011 liite XIII. Cited 1 April 2022. Available at https://eur-lex.europa.eu/legal-content/FI/TXT/PDF/?uri=CELEX:32011R0142&from=en

Fonseca, P. 2022. Matter of Trust Chile uses human hair waste to combat effects of mega-drought. Shareable. Cited 6 Sep 2022. Available at https://www.shareable.net/six-ways-to-celebrate-earth-day-with-permanent-change/

Government Decree on the Recovery of Certain Wastes in Earth Construction 843/2017. Finlex. Cited 6 Sep 2022. Available at https://www.finlex.fi/en/laki/kaannokset/2017/20170843

Hiukka Hyvä. 2022. Website. Cited 6 Aug 2022. Available at https://hiukkahyva.fi

Matter of Trust Chile. 2022. Website. Cited 6 Sept 2022. Available at https://matteroftrustchile.mercadoshops.cl/listado/agro/

Nurminen, P. 2022. Hiukka koirankarvasta ja sivutuotelainsäädännöstä. LAB Focus. Cited 20 Aug 2022. Available at https://blogit.lab.fi/labfocus/hiukka-koirankarvasta-ja-sivutuotelainsaadannosta/

Pagnucco, R. & Phillips, M. 2018. Comparative effectiveness of natural by-products and synthetic sorbents in oil spill booms. Journal of Environmental Management. Vol. 225, 10-16. Cited 20 Aug 2022. Available at https://doi.org/10.1016/j.jenvman.2018.07.094

Samon Ros, C. 2022. Peruvians donating hair to assist with oil spill clean-up. La Prensa Latina Media. Cited 20 Aug 2022. Available at https://www.laprensalatina.com/peruvians-donating-hair-to-assist-with-oil-spill-clean-up/

Torniainen, M. 2021. Senior Adviser. Finnish Food Authority. E-mails 2021-2022.

Zheljazkov, V. D., Silva, J. L., Patel, M., Stojanovic, J., Lu, Y., Kim, T., & Horgan, T. 2008. Human Hair as a Nutrient Source for Horticultural Crops. HortTechonology. Vol. 18 (4), 592-596. Cited 20 Aug 2022. Available at https://doi.org/10.21273/HORTTECH.18.4.592

Lotta Pyykkönen

Art in public spaces

Abstract

Public art is desirable and provides employment for artists. Customers commissioning public art are usually cities and municipalities that wish to develop their urban culture and image by means of art. Ideological goals are also set for art. This article discusses the concept and purpose of public art as well as the impact associated with it from the perspective of publications and topical discussion.

Keywords: public art, purpose of art, impact of art

Public art and the platform

The goal of the *Art in public spaces platform* of LAB University of Applied Sciences is to promote competence related to public art and to encourage customers to commission it. Art for public spaces is currently a form of making art that creates work for artists, as art is commissioned for environments in which people find themselves in their daily lives. The special feature of this art form is that it is created for a certain site or space that was not originally intended as a venue for exhibiting art. The nature of the venue must be taken into account when planning and making art. (Myllyntaus & Karttunen 2020, 18.)

LAB University of Applied Sciences has long traditions in making public art. Artist-centric art for public spaces already featured on the curriculum thirty years ago at Imatra Art School, the predecessor of the UAS's visual arts programme. Artist-centric public art refers to all types of art that artists create independently for venues other than galleries and museums (Myllyntaus & Karttunen 2020, 18). Visual arts students at Imatra Art School began their studies in 1988 by using art to take possession of the new facilities. The students also used the surroundings of the School as a venue for making art. Courses were often held outdoors, and students learned to draw and paint in nature. Later they also made art in the streets and learned about painting murals and glass. In further education programmes in 1993 and 1994, students created land art and light art, monumental prints and "environmental art as part of environmental construction".

In the era of LAB University of Applied Sciences, the tradition of art created for public spaces has been continued on environmental art courses, which play an important role in visual arts education. Students'

Picture 1. Alina Lampinen's work The last bumblebee (Kostiainen 2021)

interest in natural environments and using materials found in nature is particularly visible in final projects. Recycled materials are also used for artworks. Figure 1. shows Alina Lampinen's work made by welding together pieces of scrap metal. She calls this artwork recycled art (2021).

In addition to environmental awareness, multidisciplinary education has also been important. In the LARES project carried out in 2015, the visual arts programme together with LUT University of Technology provided training in laser technology use for professional artists. In this project, the participants joined their forces to innovate new uses for laser technology, and the artists also had an opportunity to try out laser technology in making art. (Maijanen et.al. 2015, 4.) The UAS also wishes to continue this tradition of multidisciplinary and innovative education in the context of the arts platform.

Autumn 2022 saw the launch of a Master's degree programme in visual arts at LAB University of Applied Sciences. In this programme, professionals of art can complement their competence related to public art. The emphasis on public art in the Master's degree programme improves artists' possibilities of finding employment and also serving as experts in public art projects.

Studio studies will similarly be introduced in the Bachelor's degree programme in 2023. This will make it possible for students to take 20-credit courses in making art for public spaces and applied public art. As large study modules, the studio courses make it possible to use authentic work situations and cooperation with customers in the teaching. Multidisciplinary studies are also being planned with the technology unit of LAB University of Applied Sciences. The goal is that art and engineering students will together consider the potential of art for public spaces and its practical solutions.

On the concept of public art

Over the last ten years, the concept of public art has, in particular, been associated with integrating art into new buildings in Finland. In 2022, the objective of promoting the realisation of the percent for art principle was set down in the Government Programme of Finland. This means that minimum one percent of a public building's construction costs should be allocated to procuring art for the building. (Myllyntaus & Karttunen 2020, 10-12.) The English concept of public art appears to refer to more extensive connections and creators of art. It covers art made for public spaces by both professionals and others, with or without permission.

The introduction of the percent for art principle has meant that municipalities' art purchases have been linked to regional planning decisions. In Finland, art projects entered in planning documents and integrated into buildings are mainly carried out by professional artists. The example of art integrated into a building that many Finnish people are the most familiar with is probably the Lantern Carriers sculpture at Helsinki Central Station (Figure 2). It was designed by sculptor Emil Wikström as early as 1914 for the building drawn by Eliel Saarinen (HAM-Helsinki City Art Museum).

Following the launch of the percent principle, the customer base of public art has diversified. Currently, art is above all customer centric. Increased attention to the customer has changed the pedagogy of visual arts education. Close interaction between the teacher, student and customer is characteristic of teaching situations. The learning environments have also changed: today they are spaces to which people come for reasons other than experiencing art. Additionally, art is designed and made on construction sites rather than in art workshops. Compromises are also necessary in making art, as the venue, context and audience of the commission must be taken into account (Kotilainen 2022, 37-40). Exhibition spaces intended for art have similarly been designed for exhibiting art.

In Finnish art discussion, the concept of public art has spilled over to have broader meanings than art integrated into buildings. Above all, public art means all types of art found in public places, buildings, parks and streets. It may be permanent or temporary, located outdoors or indoors, immaterial and audience engaging. (Myllyntaus & Karttunen 2020, 17-18.) From the art history perspective, artists have made such art forms as environmental art, land art, street art,

Picture 2. Emil Wikström's sculpture Lantern Carriers, Helsinki Central Station (Kanerva 1975)

location-specific art and performances in public spaces for quite some time. What is new is the willingness of cities and municipalities to work together with artists in developing built environments.

Purpose of public art

The heritage of public art can be seen in monuments whose purpose is to commemorate, remind and show respect in cities and graveyards. Sculptures as public art have often also had political goals, which is why the artworks have been positioned in strategic places in terms of people's movements in cities. (Lindgren 2000, 9-13.) The purpose of medieval church art, on the other hand, was tell Bible stories to people and teach them the message of Christianity (Kostet 2020, 17). Public sculptures and church art remain important building blocks of a location's identity even if their original function is no longer recognised.

In today's world, too, the customer always has some reason for wishing to place art in a venue. Public art is often linked to developing, improving and transforming a certain area. The aims may include promoting comfort and inclusion, improving the safety of the area, or changes that affect access to the area and service use. (Myllyntaus & Karttunen 2020, 14-20, 69-100.)

From the perspective of sustainable development, public art is linked to themes that promote sustainable cities and housing communities. In these themes, the challenge of compact urban structure as well as inequalities in and safety of housing are stressed (Suomen YK-liitto, Goal 11). From the cultural policy perspective, art is associated with the idea of accessibility. In a shared space, art is accessible to everyone. People need not go to museums and galleries to see art (Pulkkinen 2019, 6).

The social significance of art has been stressed in Finland for historical reasons. In the late 19th century, art had the crucial role of building uniform national culture as

Finland was struggling to gain independence from Russia. (Sevänen 1998, 273- 361, 382; Lindgren 2000, 9,15.) In the societal context, its educational and cultural significance continues to be highlighted.

Many contemporary artists also regard the social and societal tasks of art as important. Teemu Mäki (2017, 42-121), for instance, defines four basic tasks for art: 1. Giving pleasure: art must be in some way pleasant for both the artists and the recipient. 2. Communication: art sparks discussion and engages people in it. 3. Art is about seeking and producing knowledge. 4. Art develops people's emotional lives and world of experiences.

Public art is also associated with economic impacts, which are created indirectly as a consequence of the tasks assigned to art. In other words, aesthetic, social, cultural and political tasks are assigned to public art, and economic impact is generated as added value generated from them. This chain of impacts is associated, in particular, with improving the attraction of cities and areas. They use public art in an effort to distinguish themselves among other similar localities. Originality brings more residents and tourists. (Myllyntaus & Karttunen 2020, 15-16, 75-93.)

In her lecture titled *How does art have an impact on built environments?* Sari Karttunen (2022) notes that art is also regarded as having non-market benefits. Public art has features of a public utility, for which an economic value can be determined. This value is created as, for example, people feel refreshed when walking in a district featuring art.

Public art for change

The artist is a creative designer and creator. They design the artwork for the designated space, taking into consideration the features of the location and the themes specified for the work. The artist finds suitable materials for the artwork and location, designs its visual aspects and develops technical solutions for the implementation and exhibition of the work, for which the public space creates both possibilities and restrictions. The tradition of art also has essential links with making public art. Influences are sought in the works of other artists and different styles and theories. For example, artists may explore colour, shape, space, sound or even hapticity in public works. This aspect is unfortunately often not verbalised in public art projects.

Henri Terho (2022, 91) writes that public art could be made in more artist-centric ways. Artists should have freer hands for creating works for public spaces from their personal starting points. Terho believes that this would result in art that engages in a closer dialogue with its surroundings and is innovative. I have noticed that art students end up with surprising and inventive visual solutions if the space and theme are opened up for free brainstorming by them. The location of the artwork, for instance, can be unexpected, something that the customer was unable to see as a venue for art. The technique and materials of the work may also be ones that the customer does not find essential for making art. However, they may be central for the end result of the artwork. Figure 3 shows a work by Antti Ahde,

in which such materials as foam rubber and sawdust have been used.

Artists also observe things that are sometimes overlooked in daily life, or that are not experienced as significant. The impact of visual arts stems from their visual nature. Visual arts can bring up new and unexpected perspectives to our surroundings and highlight topical themes.

In 2021, the City of Lappeenranta was awarded the Greenleaf prize by the European Commission for the City's progressive climate action. As part of the festival year associated with this award, an art competition was organised, the winners of which were LAB University of Applied Sciences students Ninni Kola and Taijatuuli Louhivuori. The press release of Lappeenrannan kaupunki (2021) explains that the art competition sought a work that would strengthen the city's identity, make it more welcoming and "highlight the importance of efforts to mitigate climate change". The City also hoped that circular economy materials would be used in the work.

Picture 3. Antti Ahde and his work Van Houten and brownie at an event celebrating the 100th anniversary of Lejos titled You may play with food. (Virolainen 2021)

Ninni Kola's and Taijatuuli Louhivuori's work *The secret of Saimaa* was revealed on 25 August 2022. It consists of scrap metal collected from the bottom of Lake Saimaa as well as a frame structure made from laser-cut stainless steel (Figure 4). In line with the objectives of the competition, it deals with sustainable development and climate change in reverse. The work showcases objects abandoned in the lake and hidden from sight, which have been placed inside a frame structure.

Art made for a public space unavoidably divides opinions. Especially art brought into a shared outdoor space is openly visible to everyone moving in the area, unlike, for example, art inside buildings and at exhibition venues. Conflicting opinions on the 'right' use of the shared space and different aesthetic tastes emerge in discussions on public art. Art also awakens people to think about the environment in which they move about and live.

Shortly after it was revealed, *The secret of Saimaa* was also criticised for being unfinished, and the selection of the competition board was questioned. According to a news item in the provincial newspaper (Värtö 2022, 16-17), it was not considered sufficiently 'statuesque'. Outi Peippo (2022), lecturer in visual arts at LAB University of Applied Sciences, notes that the criticism ignores the essential feature of the work: it makes items thrown into the lake visible again in the middle of the city centre. The work shows the results of humans' questionable actions in concrete terms. Its idea is based on revealing the secret, or what humans have done. In this sense, there is no need for the work to function as a conventional sculpture. Its impact is derived from the idea.

Picture 4. Ninni Kola's and Taijatuuli Louhivuori's work The secret of Saimaa (Peippo 2022)

References

HAM – Helsinki Art Museum. Lantern Carriers: Emil Wikström. Cited 26 Aug 2022 Available at https://www.hamhelsinki.fi/sculpture/lyhdynkantajat-emil-wikstrom/

Karttunen, S. 2022. Miten taide vaikuttaa rakennetussa ympäristössä? Presentation at Kohti kokemuksellisempaa rakennettua ympäristöä – Taide rakentamisessa -webinar, 17 March 2022.

Kostet, J.2020. Onko suomalaisella museolla aatteellista perustaa? In Petterson, S & Kinanen, P. (eds.) Suomen museohistoria. Helsinki: SKS. Suomen Kirjallisuuden Seuran Toimituksia 1265. 17-26.

Kotilainen, R. 2022. Julkinen taide luo omat vaatimuksensa pedagogiikalle. Kotilainen R. (ed.) Taidetta kampuksella – julkisen taiteen käytännöt, pedagogiikka ja uudet avaukset. Turku: Turku University of Applied Sciences. Turun ammattikorkeakoulun raportteja 289. 37-49. Cited 26 Aug 2022. Available at https://urn.fi/URN:ISBN:978-952-216-818-4

Lampinen, A. 2021. Viimeinen Kimalainen -ylistys pölyttäjille. Kierrätystaidetta hitsaamalla metalliromusta. AMK-opinnäytetyö. LAB-ammattikorkeakoulu, kuvataide. Lappeenranta. Cited 12 Sep 2022. Available at https://urn.fi/URN:NBN:fi:amk-202103314087

Lappeenrannan kaupunki 2021. Ninni Kolan ja Taijatuuli Louhivuoren ehdotus ”Saimaan salaisuus” on voittanut Lappeenrannan kaupungin Green Leaf -juhlavuoden taidekilpailun. EPressi. Cited 11 Sep 2022. Available at https://www.epressi.com/tiedotteet/kaupungit-ja-kunnat/ninni-kolan-ja-taijatuuli-louhivuoren-ehdotus-saimaan-salaisuus-on-voittanut-lappeenrannan-kaupungin-green-leaf-juhlavuoden-taidekilpailun.html

Lindgren, L. 2000. Monumentum. Muistomerkkien aatteita ja aikaa. Helsinki: Suomen Kirjallisuuden Seura. Suomen Kirjallisuuden Seuran Toimituksia 782.

Maijanen, E., Hirvimäki M. & Mustonen E. 2015. Taiteilijaresidenssi Skinnarilan kampuksella. Projektiraportti 2015. Lappeenranta: Saimaan ammattikorkeakoulu. Saimaan ammattikorkeakoulun julkaisuja. Sarja A: Raportteja ja tutkimuksia 64. Cited 12 Sep 2022. Available at https://urn.fi/URN:ISBN:978-952-7055-28-1

Myllyntaus, O. & Karttunen, S. 2020. Julkinen taide aluerakentamisessa ja -kehittämisessä. Taloudellisen arvon tunnistaminen ja arviointimenetelmät. Kulttuuripolitiikan tutkimuskeskus

Cupore. Cuporen verkkojulkaisuja 65. Cited 26 Aug 2022. Available at https://www.cupore.fi/images/tiedostot/2020/julkinen_taide_aluerakentamisessa_ja_-kehittamisessa.pdf

Mäki, T. 2017. Taiteen tehtävä. Esseitä. Helsinki: Into Kustannus oy.
Peippo, O. 2022. Lecturer. LAB University of Applied Sciences. Discussion 1 Sep 2022.

Pulkkinen, M. (ed.) Prosenttiperiaatteen käsikirja taiteen tilaajalle. 2019. Suomen Taiteilijaseura. Cited 31 Aug 2022. Available at https://www.julkinentaide.fi/sites/default/files/kasikirja/Prosenttiperiaatteen_kasikirja_Taiteen_tilaajalle_2019.pdf

Sevänen, E.1998. Taide instituutiona ja järjestelmänä. Modernin taide-elämän historiallis-sosiologiset mallit. Helsinki: Suomalaisen Kirjallisuuden Seura. Suomalaisen Kirjallisuuden Seuran Toimituksia 109.

Suomen YK-liitto. 11 Kestävät kaupungit ja yhteisöt. Cited 26 Aug 2022. Available at https://www.ykliitto.fi/kestavat-kaupungit-ja-yhteisot

Terho, H. 2022. Julkisen taiteen tulevaisuus. In Kotilainen R. (ed.) Taidetta kampuksella – julkisen taiteen käytännöt, pedagogiikka ja uudet avaukset. Turku: Turun ammattikorkeakoulu. Turun ammattikorkeakoulun raportteja 289. Cited 26 Aug 2022. Available at https://urn.fi/URN:ISBN:978-952-216-818-4

Värtö, P. 2022. Romusta voi tehdä kaunistakin taidetta. Turku: Turun ammattikorkeakoulu. Turun ammattikorkeakoulun raportteja 289. Cited 27 Aug 2022. Available at https://urn.fi/URN:ISBN:978-952-216-818-4

Picture 1. Kostiainen, H. 2021.Image bank of the Fine arts programme at LAB University of Applied Sciences.

Picture 2. Kanerva, T. 1975-1979. Helsingin rautatieaseman Lyhdynkantajat -veistokset. Museo- virasto, Historian kuvakokoelma. Cited 28 Augh 2022. Available at https://www.finna.fi/Record/museovirasto.DAEB937CDC7BFB41AE23981398B8048F

Picture 3. Virolainen, N. 2021. Image bank of the Fine arts programme at LAB University of Applied Sciences.

Picture 4. Peippo, O. 2022. Image bank of the Fine arts programme at LAB University of Applied Sciences.

Marion Robinson

Sample showcase – creative marketing communication in the printed space

Abstract

The LAB Institute of Design and Fine Arts graphic design department teamed with Lahti based high quality print house Markprint to design memorable printed communication materials. Together was created an illustrated card sample set showcasing different foil, lacquer and material possibilities of the print house. This contribution is a look into the process that started in early 2021 and the final designs, published in 2022.

At the Institute of Design and Fine Arts corporate collaboration has a long tradition and takes many forms. In this contribution, the described design process took place during the graphic design second year course *Printed Publication Design*. 20 students on the course joined forces to create a cohesive concept where each student would also be given the freedom to design something of their own.

From the early onset there was knowledge the project would be published in 2022. This set the standard very high. The overall team consisted of the student members, the course lecturer and a representative from Markprint.

All pictures: Joshua Cockroft and Aleksi Malinen.

Keywords: corporate collaboration, graphic design, student work

During the pandemic the print houses were hit especially hard. The pandemic closed production at times and many industries which were major users of printed products shut down, such as restaurant and event businesses. Also, the world's arguably unsustainable delivery routes created problems. The availability of paper experienced shortages. But through the difficult times print houses survived. And so did the need for printed materials and therefore the designers' knowledge on how to best design for print.

The brief

The second year BA graphic design students were given a challenging task in connection with their studies of printing techniques. They joined forces with a local printing house Markprint, which operates nearby LAB campus. The printing house had invested in post-production technology whereas most printing houses rely on subcontracting. Their specialty is using a double varnish technique combining matt and gloss varnish on the same printed surface. After the print house had learned the technical use of their new foil printing machine, they dared to assess that the Finnish market had not necessarily seen the most creative visuals in the combination of traditional printing and new foil technology. Markprint wanted to raise the target level and show off their quality printing in marketing communication materials and packaging as well as art prints.

Printed samples have longstanding history in how print houses have showed customers their technical abilities. These have also served the designer well as a reference tool of what is available and possible. Leaning into the tradition, we planned together a format where each student would have a voice. Hence the idea of a card sample set showcasing different foil, lacquer and material possibilities emerged in the course pre-planning stage. The concept was then further developed with students in regards of the content, story and overall visuality.

The sample set was to be posted by mail to selected Markprint advertising agency

Picture 1. Metamorphosis printed card sample set

clients as a print sample. The objective of the project was to create a broad sample set to show graphic designers the varied possibilities of foils and lacquers on different card stock as an enhancement of a printed product. Important was also to produce something that a Markprint client wants to keep and appreciate on their office shelf. This is retail space which cannot be achieved in a digital format. Markprint allowed for the students to have creative freedom in their design, as long as overall costs and branding were considered.

The project had other partners as well. Metsä Board Oyj offered coated and uncoated packaging board for use in this study and development project and Tavani Oy supplied the foils. Foiling and double lacquer techniques were especially interesting to test on fairly rough uncoated card stock.

The need for material knowledge in graphic design education

Printed materials such as books, leaflets, brochures, and other marketing ephemera have been the bread and butter for designers for centuries. In this decade though we have seen a massive rise in the need to create online visuals. Naturally some designers have gravitated towards the digital space. In design education we see the general understanding of the printed, material world lessening.

Magazines and books were the go-to places for inspiration. But nowadays the students are less surrounded in printed ephemera in their everyday lives. They have become less aware of the different opportunities, the material qualities, the tactility of paper and what its manipulation offer. We, humans, are subtly aware of our surrounding using all senses to which the digital space isn't a quick answer. Matter equals emotion. Therefore, it is adamant we keep the material aspect in the graphic design education alive.

The concept

The concept of Metamorphosis was created by the students.

> "Metamorphosis:
> New ideas are constantly emerging. These abstract thoughts must be brought into the physical world. That's when the ideas come through of metamorphosis, i.e. change of shape. Printing in itself is such a transformation. The paper turns into a platform which supports the idea, the printing ink visualises it, and the resulting entity communicates the idea forward. Only a moment ago, something that was immaterial can be printed with new meaning as a physical object that can be touched and felt. This feeling cannot be packaged and shared digitally. The influence of printed text and images is still there and is an important part of our way of communicating. After the printing process, the object can initiate a new transformation when used and interpreted in new ways."

The conclusion

Different post-production methods fully reveal themselves once they are produced in real life. It takes imagination to create the final image with all its glory in the designers' mind, since the effect cannot fully be demonstrated before. Tools to demo effects exist in photoshop, but those do not generally take into account paper qualities. These tools can be a major help during the design process. But the designers' eye should really be trained to imagine it without. This is why we still focus on the material quality as a story telling method.

Picture 2. Detail from card. Design: Nadja Frantzén

Offset and holographic hot foil on uncoated cardboard

Illustration of a butterflies in a flower is amplified by holographic foiling. Their wings glisten in the ray of light. If the card was to lose the reflecting surface the story would not be complete.

"Now, by looking at the pictures of the completed sample pack and sensing the benefits, the benefits quickly open for every graphic designer, but also for those who doubt. In the development project, we wanted to offer students a platform to express their own creativity, and at the same time we got an open-minded approach to the traditional print portfolio. The end result is stunning and impressive. Samples were not made for mass mailing, but rather as special gifts for the precious clients."

Tuomas Talvitie, Partner and Sales Director. Markprint Oy.

Picture 3. Detail from card. Design: Pinja Kangas

Offset and silver hot foil on uncoated cardboard

The special underprinted silver foil make the cracks of the ice feel more sharp. The edges of water in metamorphosis are captured. The illustration would feel quite flat without the interplay of matt and gloss.

Picture 4. Details from cards

This is the third review of the publication series named the LAB Design Annual Review. This publication presents the latest research, development and innovation activities in the field of design. The aim of this review is also to introduce multidisciplinary development work and cooperation with companies and stakeholders. It contains twelve articles written by experts from LAB University of Applied Sciences.

The Publication Series of LAB University of Applied Sciences, part 57
ISSN 2670-1928 (PDF)
ISSN 2670-1235 (print)
ISBN 978-951-827-435-6 (PDF)
ISBN 978-951-827-436-3 (print)

LAB University of Applied Sciences
BUSINESS FINLAND
Ympäristöministeriö
Miljöministeriet
Ministry of the Environment
SITRA
Leverage from the EU 2014–2020
EUROPEAN UNION
European Social Fund
European Regional Development Fund
The European Agricultural Fund for Rural Development: Europe investing in rural areas
THE REGIONAL COUNCIL OF PÄIJÄT-HÄME