Review Article

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Activating sustainability in the design process

Design principles for sustainable innovation implemented at Ergosign GmbH

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Abstract: Design decisions have an impact on societies and the environment. Making the impact of design tangible facilitates the mitigation of its negative consequences. The purpose of this paper is to outline what methods and actions a User Experience (UX) practitioner could use in order to support sustainable development. At Ergosign GmbH, an agency creating digital experiences, we conducted a review of existing guidelines and principles to determine the relevance and usefulness of those frameworks in the User Experience Design (UXD) context. The analysis resulted in the creation of six guiding principles to introduce sustainability concerns into the design process. Additionally, we mapped related UX methods and heuristics to each principle. Each of the six principles, as well as an exemplary method, are described in detail in this article. A first practical evaluation of the principles suggests that assessing impact and identifying preventive actions is possible at all stages of the design process. Furthermore, there is no strict correlation of a principle with a particular project phase. While an early analysis generates a more holistic action plan, a later assessment provides more concrete advice. Both approaches can deliver notable improvements in the reduction of resource usage.

Keywords: sustainability; life-centred design; non-anthropocentric perspective; design methods; artefacts

1 Introduction

Several indicators expose that the way most businesses on this planet operate cannot be sustained in the long term without causing alarming environmental degradation and threatening humanity's existence. For instance, the UN Stats reports that the global material footprint is increasing at a faster rate than both population and economic output.[1] The global e-waste monitor states that the electronic waste generated worldwide in 2019 weighs almost as much as 5.000 Eiffel Towers.[2] In terms of environmental limits, the planetary boundaries framework update from September 2023[3] found that six out of the nine boundaries have been crossed and we are edging closer to the remaining three.

All of the factors above have contributed not only to an increase in social awareness in recent years, but also to a wider acceptance of sustainability as a core element in business imperatives. Consultants at McKinsey expressed back in 2011 that companies with positive environmental and social impacts are often more innovative and efficient than their counterparts and face fewer regulatory costs and obstacles.[4] Furthermore, the 2023 report from the Capgemini Research Institute indicates that the percentage of executives understanding the business case for sustainability has tripled between 2022 and 2023 from 21 % to 63 %. In addition, the number of executives stating that the benefits of sustainability outweigh the costs and that it extends far beyond a financial obligation has doubled.[5] From a consumer perspective, 68 % of Europeans agree that their consumption habits adversely affect the environment in Europe and globally.[6] It seems that generally speaking, corporations and consumers are aware of the importance of shifting to more sustainable practices and business models.

Despite this growing positive sentiment on sustainability and a clearer understanding of the competitive advantage it provides, investment in sustainability did not boost in 2023. Findings from Capgemini research indicate that organisations still fall behind in reporting environmental sustainability initiatives. Similarly, progress in sustainable product design has been underwhelming compared to the previous year's findings.[5]

As UX designers working for Ergosign GmbH, a digital experience agency, we were confronted with this challenge. The sense of urgency to address sustainable development

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goals seems clear. However, both trend reports and our own market experience reveal a lack of awareness in ongoing projects. Following the question, 'How can Ergosign, as a collective of designers and developers support our customers to incorporate sustainability in the design process?' this paper presents an outline on methods and actions a UX practitioner could use in order to support sustainable development.

In the following, we describe the approach we took to derive six guiding principles for sustainable innovation, accompanying heuristics and related methods. The core of the document offers an explanation of the concept behind each principle, as well as an exemplary method. The selected methodologies are explained in detail to foment practical application among other UX practitioners. Finally, we discuss the limitations of the framework and opportunities for future actions.

2 Methodology

For this assignment, we conducted external secondary research.[7] The process consisted of: (1) defining the research question and scope, (2) identifying external and internal resources, (3) collecting and analysing data, (4) reporting results and consulting stakeholders.

2.1 Setting the scope

Borrowing from the design thinking framework, we used the *How Might We* (HMW) questions[8] to cross-examine the challenge and reformulate the problem statement in a way that would enable a productive ideation phase. The resulting question was the following: 'How might we create sustainable digital experiences that contribute to a more resilient future for both people and the planet?'

After a few ideation sessions, it became apparent that our ideas were a great starting point, but needed a desk research phase to determine if they were viable, if they could fit the company strategy and which resources and processes would be required to materialise them. To accomplish this, we first searched for sources on the topic.

2.2 Building knowledge

Lacking expertise in-house, we opted for reviewing only external resources. These included legal frameworks as well as specialised reports on sustainability and market trends. In parallel, we conducted a literature review of manifestos,[9] principles,[10–12] strategies,[13,14] checklists, patterns and any other source of information[15] setting a direction for responsible, ethical and sustainable design and business practices.

2.3 Making sense of the data

Presented with an ever-growing landscape of sticky notes, we started synthesising our compiled data. We dissected design principles and tagged them based on underlying themes. After clustering those themes, categories started to emerge in a way that was resembling best practices and recommendations (Figure 1).

2.4 Refining guidelines & tools

Amongst the identified themes, we selected the ones relevant to our context of operations and subsequently formulated a description for each. After a few iterations with the project team and other stakeholders, we came up with a total of five design principles. Our approach was a coarse to granular one. We understood the principles as a high-level directive that facilitated the sketching of more concrete actionable items further in the process.

Following that logic, we started aligning heuristics observed during the data extraction to principles. Later, we also listed concrete methods and tools that relate to each heuristic. Those methods and heuristics were added to help put the principles into effect.

2.5 Performing tests

After finishing the first iteration of the principles, an occasion to validate them presented itself: The Munich Creative Business Week (MCBW) in May 2023. The event was planned in collaboration with MOVEN, a research group with researchers of the University of Siegen as well as the LMU Munich, whose focus lies on behaviour change in human-computer interaction. Under the yearly motto 'Why disruption unleashes creativity', Ergosign Munich hosted the event 'Research for more sustainability in the product development process'.[16] Five parallel workshops were organised, during which each principle was then used as a framework to approach the same challenge. The evening culminated with a moderated panel discussion.

After a very insightful session, we came together the day after to debrief the feedback from the participants. We learnt that the five principles we came up with already covered a large part of what we consider to be a necessary mindset for sustainable innovation. However, an exchange with MOVEN revealed that the behavioural aspects had not yet been sufficiently taken into account. For sustainable transformation to succeed, behavioural changes must take

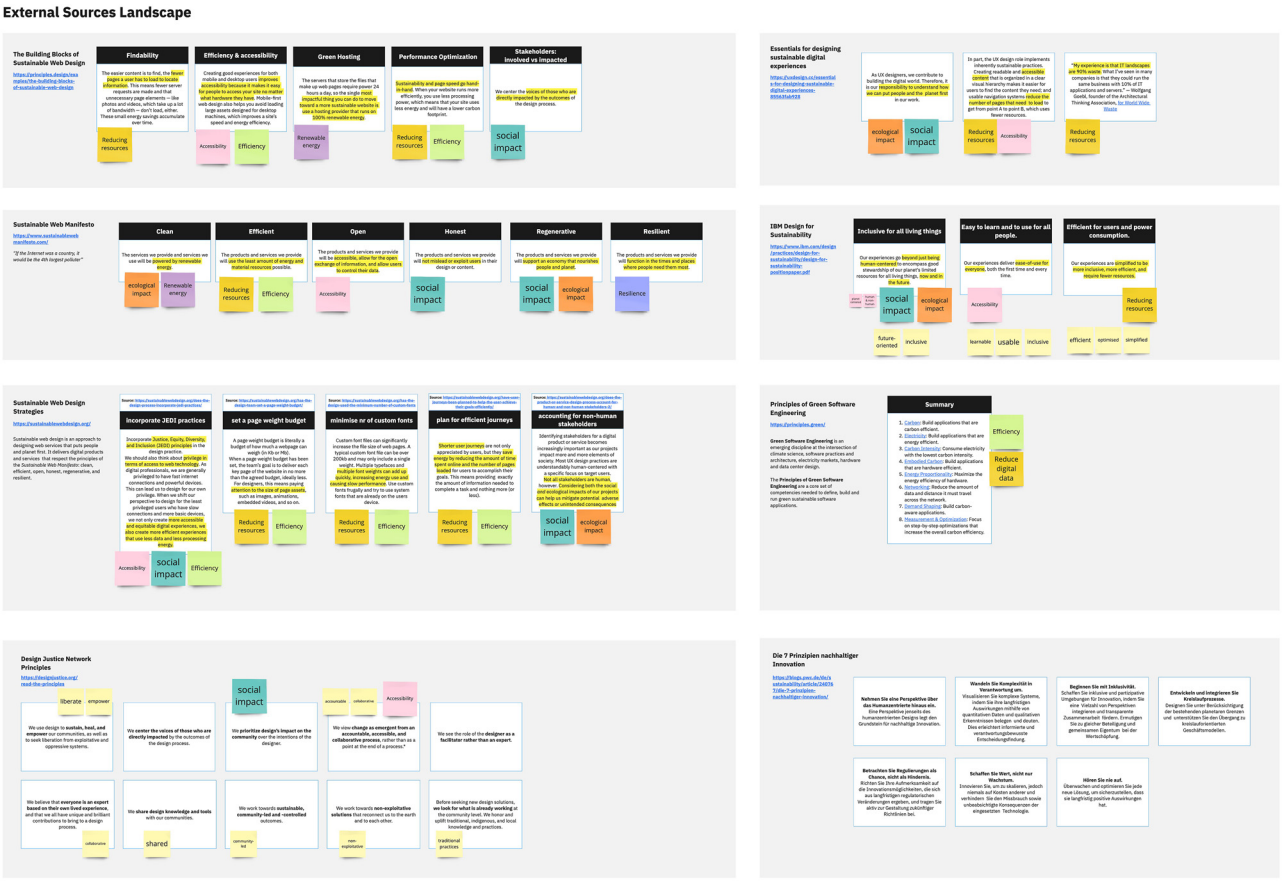

Figure 1: Excerpt of the analysed external sources, tagged with identified themes.

place.[17] Thus an additional principle, *Enable sustainable behaviours* was subsequently introduced after the event.

3 Design principles for sustainable innovation

Ergosign's six principles for sustainable innovation aim to guide the design strategy and to initiate conversations about sustainability. These resources can be used by product teams to integrate sustainability seamlessly into the design processes. For instance, they can be used in workshops to reframe problems and ideate through a sustainability lens (Appendix Table A1).

The principles are to be seen as overarching standards that can give direction to our actions. They can and should be interpreted at different levels and put to use depending on the context of a project. Therefore, the provided examples do not cover all facets of possible applications.

In the upcoming sections, we will offer a definition of each principle, as well as a list of the associated heuristics. Some supporting methods are enumerated, followed by concrete instructions and figures that illustrate how a specific method was put into practice.

3.1 Principle #1: Shift to systems-centricity

Description: The first principle challenges us to recognise the multidimensional impact that digital products and experiences have on societies and their environments. We encourage designers to understand the interdependencies of the systems in which a product comes into play and the cascading impact of their decision-making.

Associated Heuristics: Accountable, Clean, Harmless.

Supporting Methods: Non-human Personas, System Centred Design Canvas, Value Proposition Canvas.

Exemplary Method: System Centred Design Canvas.

Just as Human Centred Design (HCD) accounts for fictional representative groups of human users, the same can be done by creating non-human personas to make their needs and pain points visible. Research data on human and non-human personas can then be used to map the negative impact of a service or product at an individual,

societal and ecosystem level on a *System Centred Design Canvas*.

How to use it: The *System Centred Design Canvas* derives from combining the *Actant Mapping Canvas* by Monica Sznel & Marta Lewan[18] and the *Life Centred Purpose Tool* from Damien Lutz.[19] The first step is to brainstorm the impact that a product or service idea can have on individuals. Afterwards, all systemic and non-human problems that result from this product, service or idea are listed. If research is available, human and non-personas can be considered at this point by including their pain-points in the canvas. To make sure all different dimensions of sustainability are covered, the six Ergosign principles on the bottom can be used as a lens to ideate from different perspectives. Finally, a voting exercise should be planned to determine the most pressing issues given the risks they pose at environmental, societal and economic levels (Figure 2).

3.2 Principle #2: Build to last

Description: The second principle emphasises the importance of designing products that will remain relevant and useful over time. When digital experiences are devised with longevity in mind, they contribute to reducing electronic waste, since accounting for repairability and reuse mitigates the need for device replacement.

Associated Heuristics: Resilient, Durable, Regenerative.

Supporting Methods: Holistic Futures Wheels, Janus Cones.

Exemplary Method: Holistic Futures Wheels.

Methodologies from the speculative design discipline[20] allow us to time travel and visit alternate futures, both utopian and dystopian. Once possible scenarios have been unveiled, dystopian ideas can be related to our present to – hopefully – prevent them from ever existing.

How to use it: Using the *Holistic Futures Wheel Template* from Damien Lutz,[21] that is based on the *Futures Wheel* by Jerome C. Glenn,[22] we propose mapping the consequences of a challenge and identifying whether the results are of neutral, positive or negative nature. The starting point is the challenge at the centre of the wheel. Then, the surrounding shapes can be filled with possible direct consequences of this scenario if it were true. From there,

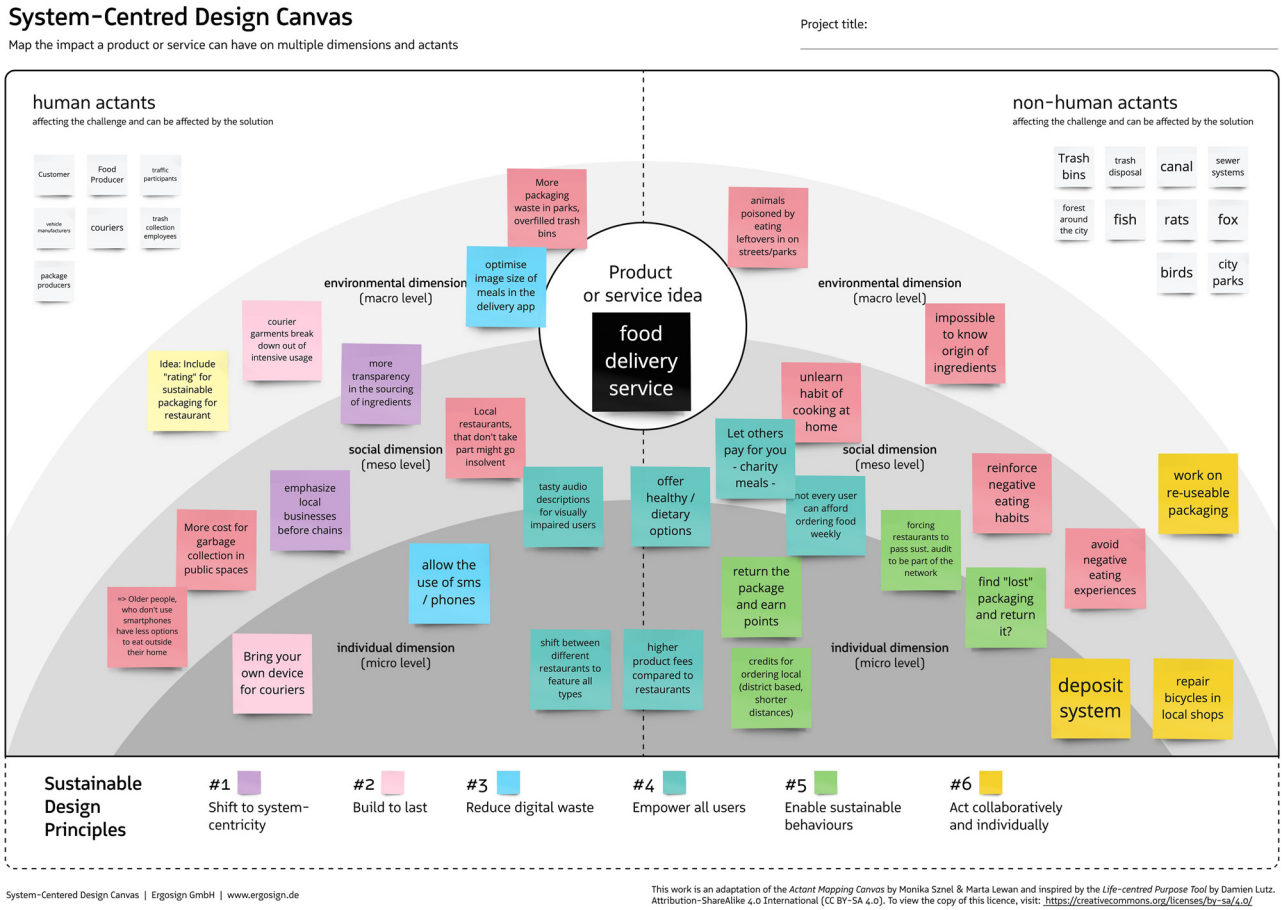

Figure 2: Exemplary usage of the system-centred design canvas.

indirect consequences can be identified and mapped in the outer ring. The number of levels of indirect consequences is not limited and can be expanded accordingly. For easier processing, results can be colour-coded into neutral (grey), positive (green) or negative (red) (Figure 3).

3.3 Principle #3: Reduce digital waste

Description: The third principle highlights the need to minimise unnecessary resource usage in digital products and experiences, just as we would for physical products. In an era marked by mass data creation, it is key to understand the tangible aftermath digital waste has on the material world.

Associated Heuristics: Optimised, Efficient, Findable.

Supporting Methods: Sustainable Web Design Practices, Green Web Guidelines.

Exemplary Method: Green Web Guidelines.

Danny van Kooten,[23] a software developer at Radboud University, came up with a very helpful calculation that depicts how much of an impact an adjustment in his work can have. For instance, he estimates that trimming even 1 kB in a Wordpress plugin that runs on over 2 million different websites can have significant implications in terms of environmental sustainability compared to choices in other areas of his life. Assuming each of those websites receives 10.000 unique visitors per month, 1 kB less would reduce CO_2 emissions by an estimated 2,950 kg per month.[24] This provides a compelling example of how small improvements on websites can contribute to a significant carbon footprint reduction.

There is no universal method that will make every website or application more resource efficient. However, there are multiple publications listing sustainable web design practices that provide actionable recommendations. They come in different formats: guidelines, checklists, kits, etc. We have evaluated some resources and prioritised the actions that can provide the biggest impact in the majority of use cases.

How to use it: *Green Web Guidelines - Improving web sustainability for developers and designers* is a document listing various factors that make websites and related technologies more environmentally friendly. Those factors are

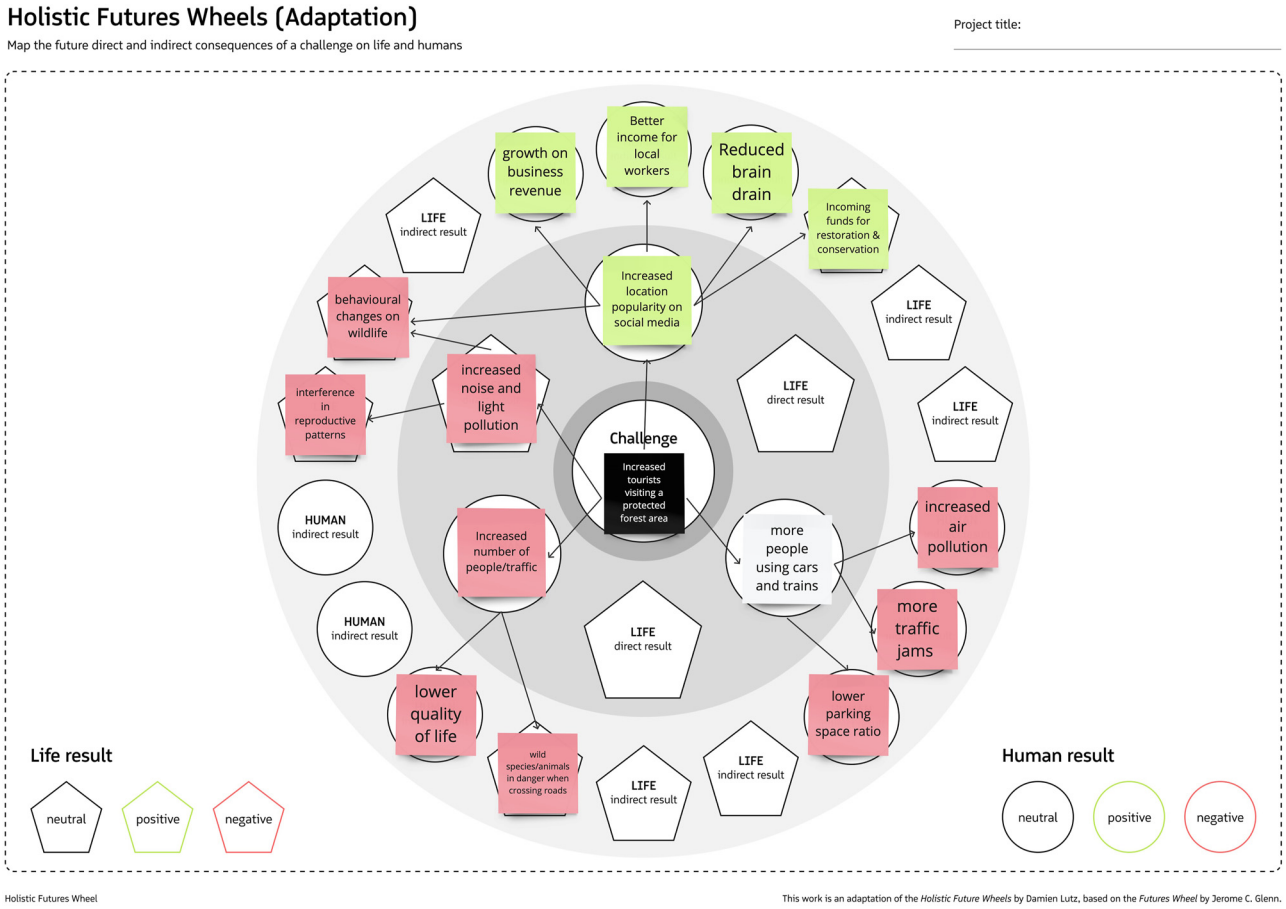

Figure 3: An adaptation of the holistic futures wheel.

categorised into 16 topics. To maximise effectiveness, it is fundamental that design and development work closely together. This document is therefore intended as a basis for discussion for the project team. To kick off, a workshop with developers, designers and other stakeholders involved in the project can be scheduled. Using the cards from a template in Miro,[25] topics are discussed one by one as a group. During the conversation, the boxes found on each card should be filled out. The boxes contain key aspects like defining the status quo, effort of implementation, priority rating, actionable items and their ownership. At the end of the session, the team should come up with a working agreement on how to collaborate in the future (Figure 4).

3.4 Principle #4: Empower all users

Description: The fourth principle underscores the importance of assessing the impact of technology on populations in order to avoid perpetuating existing inequalities. It calls for tackling injustice by recognising the diverse needs and abilities of all users. By designing with equity and accessibility in mind we can reduce biases and empower marginalised communities.

Associated Heuristics: Accessible, Fair, Inclusive.

Supporting Methods: WCAG Guidelines, JEDI Practices, Web Sustainability Guidelines.

Exemplary Method: Why A11y.

Accessibility cannot simply be worked through like a checklist.[26] It is rather a mindset, a way of thinking that needs to include not only our own reality, but also the perspective of a myriad of other actors. Online tools like *Web Perspectives*,[27] based on the Web Content Accessibility Guidelines (WCAG),[28] provide condensed information on each accessibility heuristic. Moreover, criteria can be filtered by user role, conformance level, project phase, device, etc. Another method to build awareness and empathy within a project is by playing *Why A11y*, a memory game including important terms for digital accessibility. *A11y* is an abbreviation for Accessibility. It stands for the first and last letters and the 11 characters in between and is pronounced 'Ally'.

How to use it: With *Why A11y*, you can playfully learn the most important terms related to accessibility. In this special game, pairs of cards do not show the same picture, but instead opposite pairs of terms and their explanations. The setup requires a table, at which 2–4 players are placed. Next, all cards are shuffled and laid face down on the table in a square grid. Taking turns, each player reveals any two cards. If a match is made, the player reads the definition and

Figure 4: A selection of Ergosign's Green Web guidelines as a Miro canvas.

keeps the cards. The game is over when all pairs of cards have been found and revealed (Figure 5).

3.5 Principle #5: Enable sustainable behaviours

Description: The fifth principle advocates for the intentional use of design strategies to influence specific behaviours in individuals or groups. Cultural change cannot be initiated by technological and organisational innovations alone and must additionally be accompanied by fundamental changes in the behaviour of citizens and consumers. By employing insights from behavioural psychology, cognitive science, and human-centred design, designers can create interventions that make it easier and more appealing for people to make positive choices.

Associated Heuristics: Situated, Persuasive, Frictional.

Supporting Methods: Nudging, Implementation Intentions, Pleasurable Troublemakers, Social Comparison, Goal Setting.

Exemplary Method: Persuasive and situational factsheets.

The persuasive and situational behavioural principles represent two different approaches. On the one hand, they assume that the reason for people not performing the target behaviour is due to a lack information. If they receive said piece of information, they will likely behave accordingly. On the other hand, people only reflect on their behaviour to a limited extent. It therefore makes sense in some situations to change the context in such a way that a desired behaviour becomes significantly more likely.

How to use it: A way to activate these principles is to bring the persuasive and situational factsheets from MOVEN into an ideation session. The factsheets can be visible during the brainstorming task and aid in explaining to

Figure 5: Why A11y, a memory game that helps people understand concepts associated with accessibility.

participants the strategies that influence behaviour beforehand (such as such as changing the context or providing information about a behaviour). For instance, in our collaborative workshop during the Munich Creative Business Week in 2023, we printed the sheets and hung them on the wall near the ideation canvas.

The challenge at hand in the session was to design a smart heating system that would encourage neighbours in a building to behave sustainably. We started off by mapping out the past, present and possible futures of heating systems by using the *Janus Cones*[29] method. Afterwards, we opted for a reverse brainstorming method – given that bad ideas tend to come easier than ideal solutions – and used dot voting to select the most 'evil' one. Later, using the MOVEN factsheets as references, we turned those bad ideas upside down by applying behavioural design techniques. Since we were building up on principle *Build to last*, the goal was to come up with solutions to avoid possible negative events unfolding in 30 years' time (Figures 6–8).

3.6 Principle #6: Act collaboratively and individually

Description: The sixth and final principle calls for collective problem tackling as an indisputable key to effective systemic transformation. Simultaneously, it recognises the need for individuals to take ownership in their practice and become catalysts for change at a human scale.

Associated Heuristics: Collaborative, Adaptable, Pioneering.

Supporting Methods: Circularity Matrix, Ecosystem Partner Identification, Capability Assessment.

Exemplary Method: Circularity Matrix.

The most influential companies in the world play a big part in paving the way for innovation and setting new standards in their sectors. However, there is only so much a single corporation can do in isolation. Organisations are better off supporting collaboration within their industry if they are to solve problems in their supply chain or address

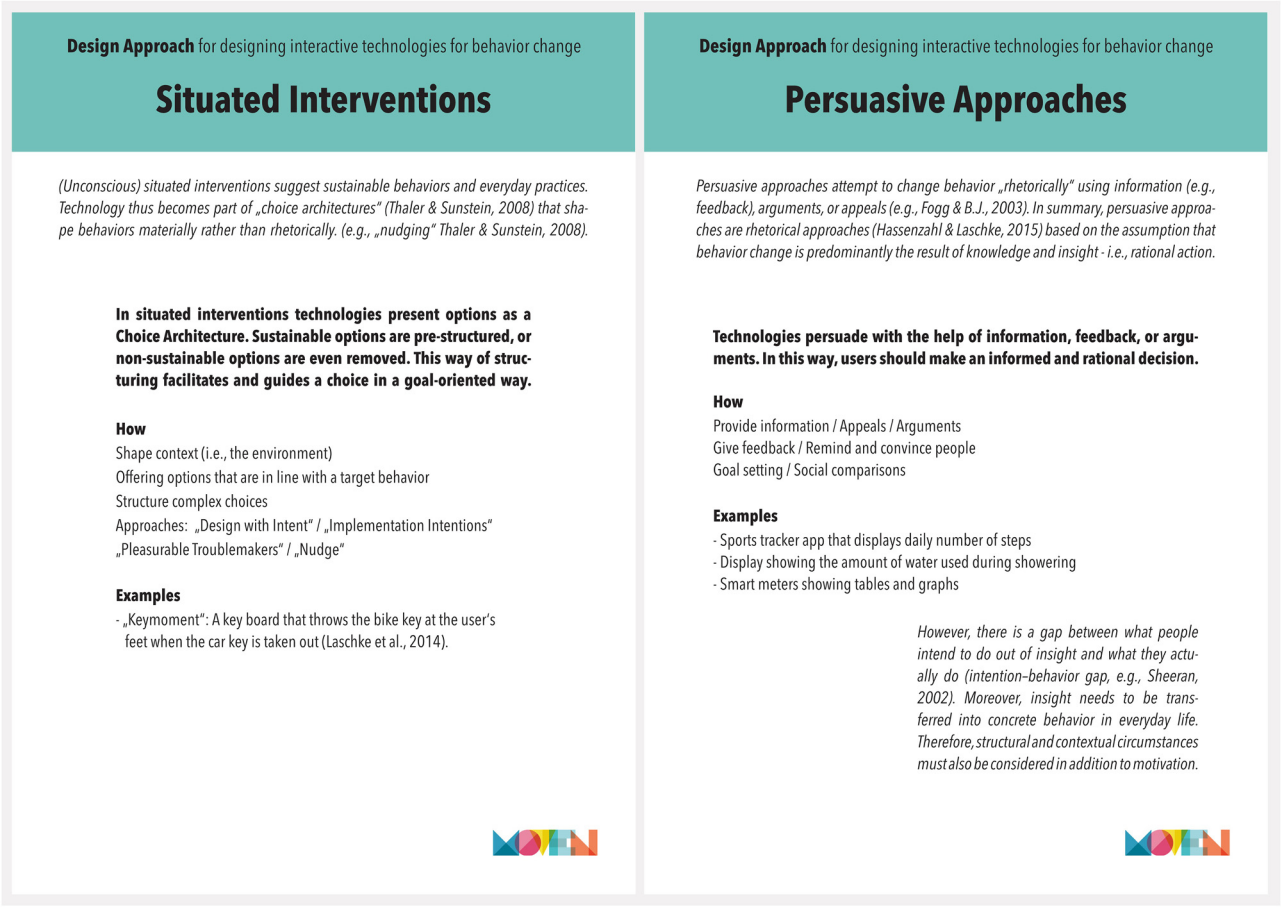

Figure 6: MOVEN persuasive and situational factsheets.

Figure 7: Documentation of the ideas generated during a reverse brainstorming session.

issues like climate change.[30] This is especially relevant for organisations wanting to transition from linear to circular business models.

How to use it: The three basic circularity strategies are retaining product ownership (RPO), product life extension (PLE), and design for recycling (DFR). A tool like the *Circularity Matrix* from the *Harvard Business Review* (HBR) aids in selecting which strategies are most appropriate for a company in order to transition into a circular business model.[31]

To perform this assessment, two questions must be answered: (1) How easy is it to get the product back?, (2) How easy is it to recover value from the product? The answers can be mapped in a 2×2 matrix, wherein difficulty of material processing and material access are mapped along the X and Y axis. This results in four possible quadrants: (1) hard to access and hard to process; (2) hard to access but easy to process; (3) easy to access but hard to process; (4) easy to access and easy to process. If material access or processing is difficult (quadrant 2 and 3), finding partnerships is of high relevance if the chosen business strategy is DFR. In the fashion industry, we find many cases of retailers teaming up with specialised companies with more advanced technologies in order to extract, recycle or produce certain fabrics that manufacturers use as raw materials for garment production. Tools like the *Sustainability Map*[32] can help companies find partners in specific sectors that are committed to sustainability (Figure 9).

3.7 Embedding the principles in the design process

Principles are difficult to assign to a particular design phase. However, there are some heuristics and methodologies that can work better depending on the particular objectives of a project phase.

For example, the principle *Shift to systems centricity* can be integrated in earlier phases with ease. That is, because it is calling for assessing the environmental and social impact of a service or product upfront. This fits perfectly in the research and strategy phase of a project. The same goes for the principle *Build to last*. It serves to forecast direct and indirect consequences that a service can have in

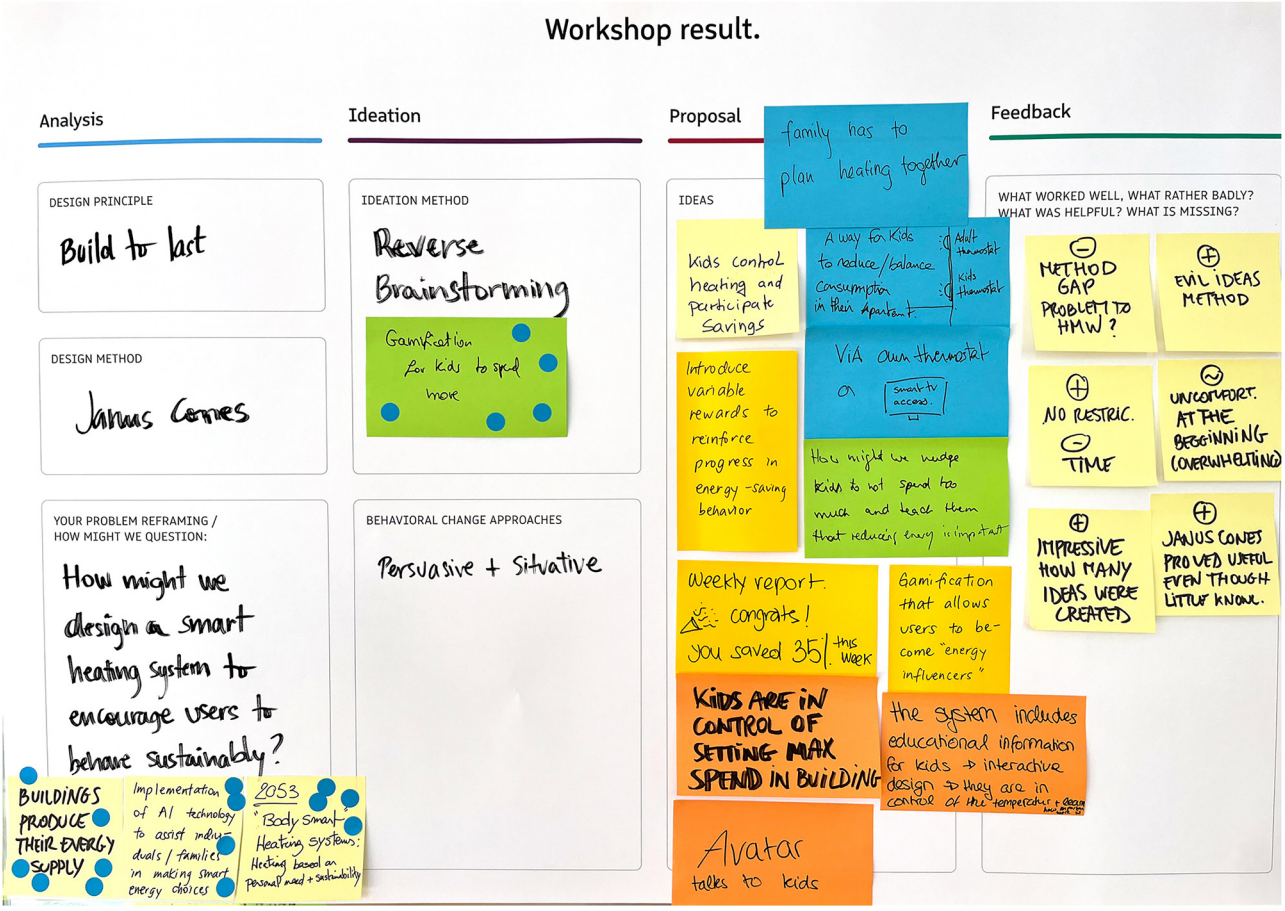

Figure 8: Workshop result canvas showcasing proposals after applying behavioural design principles.

the long run. Although the future cannot be predicted with certainty, this conceptual exercise allows us to plan steps in order to manage or reduce negative consequences. The generated outcome can in turn inform a synthesis phase, for example when defining the user journey and its opportunities. Other principles such as *Reduce digital waste* and *Enable sustainable behaviours* encompass actionable advice that is relevant for every phase.

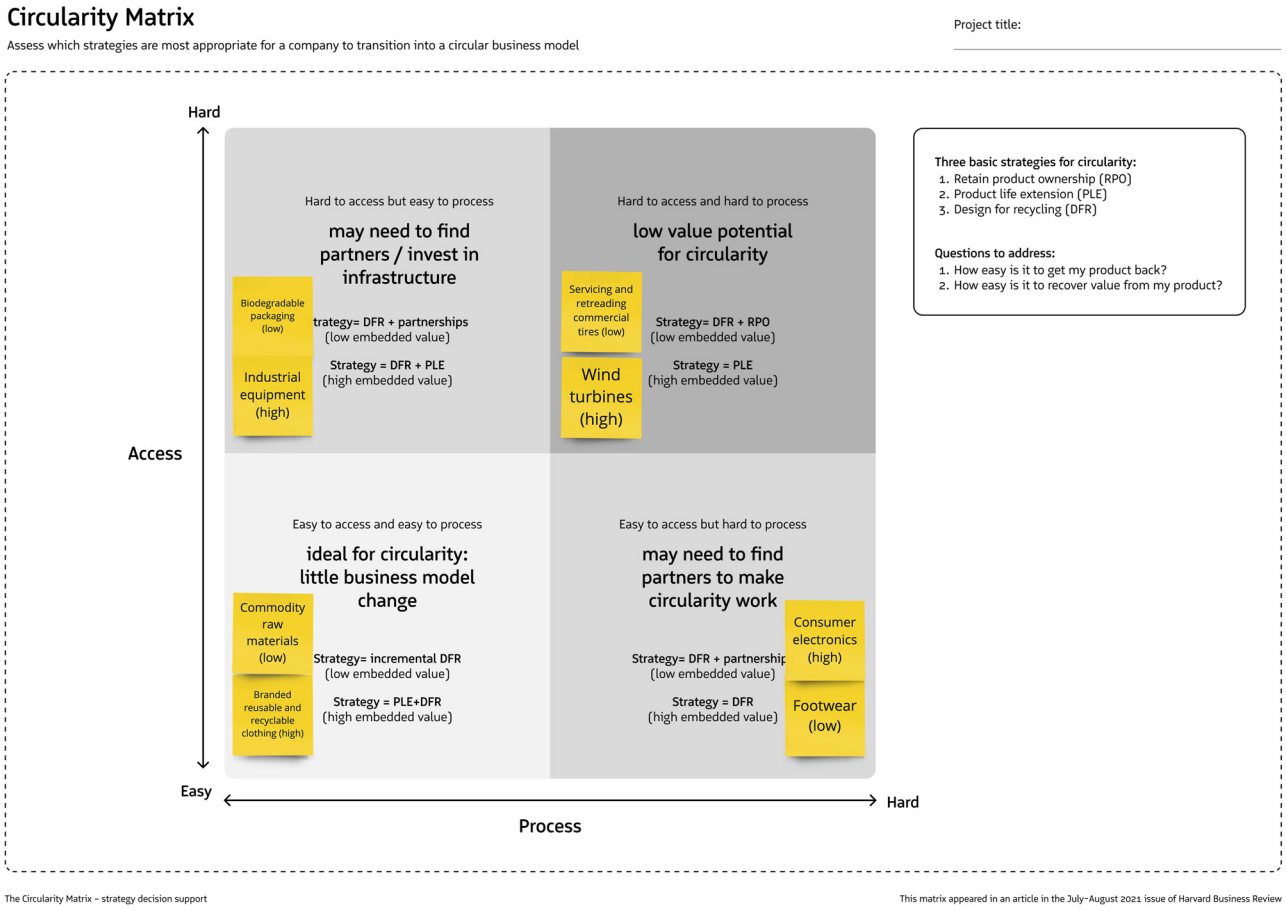

Figure 9: Circularity matrix by HBR, enhanced with decision aid on sticky notes.

4 Conclusions

With environmental degradation and an increasing global material footprint due to human consumption habits, the role of UX design in promoting sustainability goals becomes more critical.

After conducting external secondary research, we developed six guiding principles to integrate sustainability concerns into the design process. The provided resources offer a structured approach tailored to the UX workflow. Most of the methods described in this paper aim to make the environmental and societal impacts of design decisions tangible. By making visible multidimensional implications of product use, UX practitioners are better equipped to raise awareness for human and non-human needs amongst project team members.

Our findings suggest that an early assessment facilitates a holistic approach to planning sustainability actions, while later assessments provide smaller actionable items. Both approaches contribute to measurable reductions in emissions and resource usage. Moreover, our empirical evaluation highlighted the absence of a strict one-to-one correlation between principles and design phases, offering flexibility to apply sustainability principles throughout the design lifecycle.

Due to the time constraints of this analysis and the nature of the chosen sources, the resulting principles and methods might not be applicable in every context. We intend to iterate on, improve and refine the principles, heuristics and methods and are open to feedback that would help us do so. Future research should explore the practical application of these principles across diverse projects and contexts to further validate their effectiveness and reduce potential biases.

Ultimately, this article contributes to the growing recognition of sustainable design as a vital component of responsible UX practice, paving the way for responsible digital experiences.

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Appendix

Table A1: Overview of six design principles for sustainable innovation, associated heuristics and supporting methods.

#	Principle	Heuristics	Recommended actions	Methods
1	**Shift to systems-centricity** Recognise the multidimensional impact that digital products and experiences have on societies and their environments. We encourage designers to understand the interdependencies of the systems in which a product comes into play and the cascading impact of their decision-making.	**Accountable**	– Perform a lifecycle analysis to detect inefficiencies and risks – Map impact at an individual, societal, ecosystem and global level – Account for human, non-human and non-user personas – Mind a product's revenge effect – Think about the global and local costs of inaction	– Lifecycle map – Actant mapping canvas – System-centred design canvas – Non-human personas – Spectrum mapping – Materiality matrix
		Clean	– Host on servers or data centers that are 100% powered by renewable energy sources and repurpose the excessive heat produced – Choose a hosting located as close as possible to the core user base – Question the disposal process of your product	– Green hosting
		Harmless	– Prioritise users' mental & physical well-being – Evaluate and avoid the possible conflicts emerging in the local communities throughout the supply chain	– Involved vs impacted stakeholder map – Context map
2	**Build to last** Design products that will remain relevant and useful over time. When digital experiences are devised with longevity in mind, they contribute to reducing electronic waste, since accounting for repairability and reuse mitigates the need for device replacement.	**Resilient**	– Ensure that the product or service can continue to perform effectively and meet user needs under economic fluctuations, technological advancements or environmental changes – Account for usage in different contexts or varying user requirements	– Janus cones – Futures wheel – Headlines of the future – Future scouting
		Durable	– Shift to a circular business mode – Adopt circularity strategies – Design to withstand wear and tear, reducing the need for frequent replacements and minimising waste – Offer repair, remanufacture and upgrade services that coexist with your products	– The circularity matrix
		Regenerative	– Design waste out of a product's lifecycle by transforming it into something else – Aim not only to avoid, but to reverse the effects a service or product triggers at an ecological level – Provide additional value back to nature and society	– Lifecycle map

Table A1: (continued)

#	Principle	Heuristics	Recommended actions	Methods
3	**Reduce digital waste** Minimise unnecessary digital resource usage – just as you would for physical products. In an era marked by mass data creation, it is key to understand the tangible aftermath digital waste has on the material world.	**Optimised**	– Reduce asset file size – Set a page weight budget – Avoid auto-loading content – Choose the lowest-impact medium for a message – Reduce frontend and backend resources – Minimise the number of custom fonts	– Green web principles – Sustainable web design practices
		Efficient	– Plan for efficient journeys – Assess better way and timing for loading or processing (caching vs live-time synching) – Exclude non-relevant content and features (review metrics and make decisions regularly) – Collect only relevant user data	
		Findable	– Use flat navigation structures – Optimise the information scent of your content – Invest in Information Architecture activities at the beginning of the project	– Card sorting – Tree testing
4	**Empower all users** Assess the impact of technology on populations in order to avoid perpetuating existing inequalities. It calls for tackling injustice by recognising the diverse needs and abilities of all users. By designing with equity and accessibility in mind we can reduce biases and empower marginalised communities.	**Accessible**	– Include alternative descriptive text for images – Add captions and/or subtitles for videos – Ensure that a contrast ratio of at least 4.5:1 exists between text and background behind the text – Indicate a state with more than just colour – Ensure all functionality available by mouse is available by the keyboard – Design with reduced motion – Make error messages descriptive and, when possible, actionable – Place repeating navigations across pages in the same location	– WCAG guidelines – Ergosign accessibility guide – Why a11y game
		Fair	– Avoid dark patterns – Promote good health, wellness and more sustainable behaviours – Respect the user's privacy – Always provide an option to decline tracking – Ask yourself if your product will create any discrimination against a minority or harm a specific group – Ensure the sourcing of the materials is free from forced child-labour	– JEDI practices (justice, equity, diversity, and inclusion) – Anti dark patterns – Ethical design scorecards – Ethical blueprints
		Inclusive	– Include the people you are designing for in your teams (design with people and not for people) – Design services for people who are not digitally privileged	– Dollar street

Table A1: (continued)

#	Principle	Heuristics	Recommended actions	Methods
5	**Enable sustainable behaviours** Use design strategies intentionally to influence specific behaviours in individuals or groups. Cultural change cannot be initiated by technological and organisational innovations alone and must additionally be accompanied by fundamental behaviour change of citizens and consumers. By employing insights from behavioural psychology, cognitive science, and human-centred design, designers can create interventions that make it easier and more appealing for people to make positive choices.	**Situated**	– Present options as a choice architecture: sustainable options are pre-structured, or non-sustainable options are even removed (situative interventions) – Design systems in a way that the most ecological choices are pushed or selected by default	– Pleasurable troublemakers – Implementation intentions – Nudging
		Persuasive	– Persuade users to make a certain choice with the help of information, feedback or arguments (persuasive approaches) – Present feedback on performed actions to elicit a human's reflective system (based on reasoning and knowledge)	– Provide information, appeals or arguments – Give feedback – Send reminders – Social comparisons – Goal setting
		Frictional	– Aim at creating friction (mainly through choice) to highlight and suggest behavioural alternatives to established routines – Do so in a light, often naïve, understanding or even ironic way	– Friction – Humour
6	**Act collaboratively and individually** Promote collective problem tackling as an indisputable key to effective systemic transformation. Simultaneously, recognise the need for individuals to take ownership in their practice and become catalysts for change at a human scale.	**Collaborative**	– Look for opportunities to collaborate with other organisations or networks to amplify your impact	– Systems thinking – Ecosystem partner identification
		Adaptable	– Experiment with prototypes and iterations, embracing a mindset of continuous improvement to refine sustainable design solutions	– Organisational change – Maturity/capability assessment
		Pioneering	– Go all-in in: stop investing in the old stuff – Raise awareness about sustainable design principles and advocate for their implementation in the industry and society – Go beyond minimum regulatory requirements and aim for higher sustainability standards, seeking certifications and recognition for environmentally responsible design – Stay informed about the latest developments, technologies, and best practices in sustainable design through continuous research and education – Measure the environmental and social impact of your designs via metrics and communicate achievements to stakeholders, clients and the public	– Research and development – Metrics and reporting – Pilot projects – Innovation workshops – Design thinking

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