ARCS OF IMPACT
RELATING SYSTEMS THINKING & DESIGN
RSD14 | OCTOBER 2025

Exploring the Solution Space— Landing Zones as a tool for systemic intervention channels

Maud Gruyters, Stine Moons, Ivo Dewit and Alexis Jocoby

While systemic design is getting more attention in research and practice, design education is following by expanding its design programs with systemic design courses and electives. This expansion uncovers new challenges for design educators and students. One of these challenges is a recurring bottleneck in the systemic design process: moving between the analysis phase and the design phase. Design students can get overwhelmed by the amount of information they gathered and feel a sense of knowledge paralysis when they need to move on to explore the possibility space with design interventions. The increased complexity of the multilevel and multiperspective design challenges not only creates a larger possibility space but also opens up the range of possible intervention configurations. Products or product-service solutions are no longer the only possible answers to systemic design challenges: students need to determine the best possible combination of products, services and systemic design interventions for their problem, while strengthening and enriching the relations between the different interventions. To assist students in this bottleneck moment in the systemic design process, the Landing Zones tool was created in an iterative process of research through design. The tool makes it possible to restructure design interventions on a range between systemic solutions and product solutions, connecting them to the previously defined leverage points and involved and affected actors. The tool was tested with students doing a systemic design master's thesis project at the University of Antwerp and improved upon based on their feedback, gathered in a survey. The results show that the tool did support the students in lowering the threshold between the analysis and design phase, but could be improved upon to make it more suitable for decision-making and actor involvement. The Landing Zones proves to be a valuable

addition to the growing body of tools and methods to support the systemic design process for students learning to navigate the complexity of systemic design.

KEYWORDS: systemic design, design education, tools & methods, complexity, exploring the possibility space

RSD TOPIC(S): Learning & Education, Case Studies & Practice and Methods & Methodology

Introduction

With the growing recognition of complex global challenges, design education must evolve to equip students with the methods, tools, and frameworks needed to address these issues. Systemic design is a relatively new sub-discipline in the field of design that offers existing educational programs a significant challenge and opportunity (Jones, 2014). Disciplines such as design, design engineering, and product development face a strategic decision: to what extent and how to expand their design approach to include new methodologies for tackling wicked and complex problems (Norman & Stappers, 2015). This transition requires creating well-structured learning materials, dedicated courses, and tailored guidance to support both students and staff (Meyer & Norman, 2020). Traditional design and product development emphasise creating concrete products and services through linear and iterative processes such as user-centred design, design thinking, and prototyping. Systemic design, on the other hand, prioritises understanding and addressing complex, interconnected systems. These complex problems have a multifaceted and non-linear nature, involving multiple actors, and defying single isolated solutions. They are emergent: patterns are visible and retraceable, but not predictable (Andersson & Törnberg, 2018; Kurtz & Snowden, 2003). Designerly practices in this context require different skills and approaches. At the Faculty of Design Sciences, University of Antwerp, the Department of Product Development offers an elective systemic design course for first-year master's students. This course introduces students to the systemic design methodology of Jones & Van Ael (2022) to tackle complex problems. Through this course and engaging with this methodology, students not only gain a better understanding of systemic design but also broaden their perspective on design practice and their potential role as designers. As a

result, some shift towards systemic methodologies for their master's thesis projects. These students adopt systemic methodologies either because they recognise the systemic nature of the issue they want to address or because they develop a strong interest in the methodology itself, selecting topics that align with its principles (Moons et al., 2025).

However, this shift to systemic methodologies in master's thesis projects is not without challenges. A previous study (Moons et al., 2025) followed and interviewed students who applied systemic design in their theses, to uncover the challenges and opportunities of the approach, supervising systemic theses, and the students' perspective on impact. This study highlights difficulties that often emerge during the transition from a systemic analysis to the idea generation and design phase. One of these challenges becomes evident during the transition from analysis to synthesis when students struggle to interpret leverage points due to an overwhelming stream of new information. The knowledge they acquired, leads to paralysis, leaving the students feeling powerless and hesitant to progress. These struggles persist into the idea generation and design phase, where students struggle to select intervention strategies without being reductionist. Despite a strong emphasis by supervisors on aligning their choices with leverage points, many projects lose their systemic focus during this phase. Additionally, students often struggle to be innovative, leading to similar thesis outcomes, such as governmental services, toolkits with services, and infrastructure solutions. These challenges underline the need for extra support in this key bottleneck in the systemic design process.

The complexity of the systemic design process is widely acknowledged, and a growing body of literature explores ways to support this process. Several scholars defined key principles of systemic design (Bijl-Brouwer & Malcolm, 2020; Jones, 2014; Ryan, 2014). Building on this, Jones and Van Ael (2022) developed a methodology for systemic design and collected and created tools to support its various phases. With many tools supporting the synthesis- and idea generation phase. In addition, there are tools that can be used to facilitate the transition between these two phases, like the Three Horizons (Jones et al., 2022, adapted from Sharpe et al., 2016) and the Value Proposition (Den Ouden, 2012).

Although tools exist to support this transition from synthesis to idea generation, they remain limited. To address this gap, this paper introduces Landing Zones, a tool designed to help designers expand the possibility space and explore a range of intervention channels. Landing Zones both help to overcome knowledge paralysis to initiate the design process and ensure awareness of and connection to leverage points and the broader system in which their interventions operate. Additionally, Landing Zones offers a different way of exploring the possibilities on a range between systemic interventions and product solutions. Following this introduction, the paper outlines the methods used to develop, test, and validate the Landing Zones tool. The results present a detailed explanation of the tool and its components, followed by the experiences of the students with the tool. In the discussion, an improved version of the tool is presented based on the feedback of the students, the applicability of the tool in different contexts and the paths for future research are discussed.

Method

Iteration and test of the tool

The development of the Landing Zones tool followed a Research Through Design (RtD) approach, in which design practice served as a method of inquiry and a means of knowledge generation (Frayling, 1993). Initially, the tool emerged as an intuitive response to a practical challenge encountered during a systemic design master thesis project: the transition from synthesis to idea generation. In its original form (see Figure 1), the tool consisted of a description of the broader context and different intervention channels connecting interventions. This early version functioned as a conceptual aid rather than an articulated method.

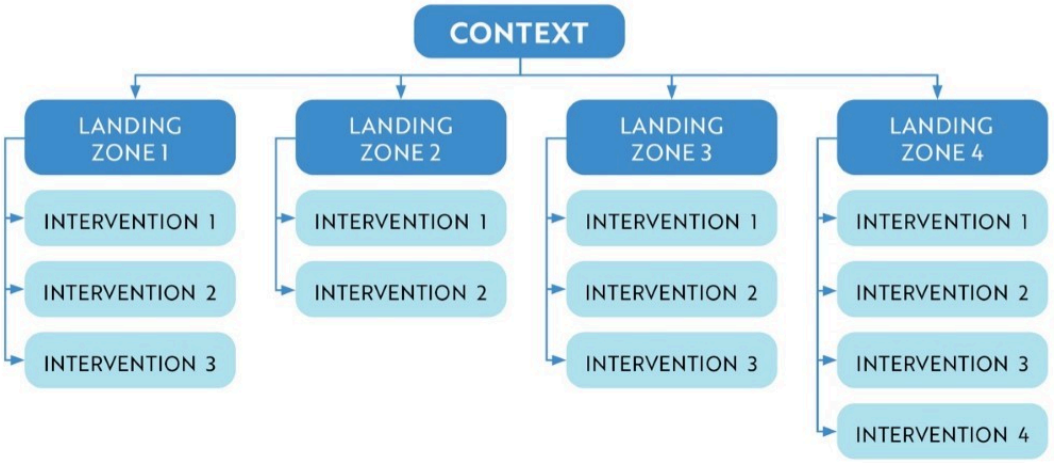


Figure 1. First version of the Landing Zones tool.

However, as the same challenge surfaced across multiple student projects, the need for a more structured and generalizable version of the tool became evident. The second iteration was thus developed through a RtD process. This involved revisiting the tool's structure and grounding its redesign in a deeper investigation of the recurring barriers students faced during this transition between phases. Challenges such as knowledge paralysis, losing sight of leverage points, and limited familiarity with the systemic design methodology were identified through informal observations, supervision sessions, and reflections on previous thesis outcomes. The tool was revised to better address these challenges by including three dimensions; the range between systemic interventions and product solutions, included leverage points, and involved actors.

This methodological evolution, from intuitive prototype to research-informed redesign, was further examined through multiple case studies with students. Since the tool's introduction to systemic master thesis students in 2023, the tool has been integrated into the approach of eight master thesis projects. Six of these projects are completed, providing insight into the tool's application and outcomes, while two are still ongoing projects, continuing to inform iterative development.

Validation of the tool

To validate and reflect on the Landing Zones tool, a short survey was sent to all students who used the tool into their master's thesis projects. Out of the eight students, seven

participated in the study. The survey serves as a means of validation by assessing the tool's perceived value in supporting their work. Students were asked about how they used the tool, allowing for comparisons across peers and an evaluation of how their application aligns with the authors' intended purpose. Besides validation, the survey also fosters reflection, inviting students to suggest improvements and identify the stages in the design process where they found the tool most beneficial.

Results

The result section is divided in two main parts. The first part explains the use and intended purpose of the tool. The second part presents the results of the student survey, which investigates the students' experience with the tool.

The tool

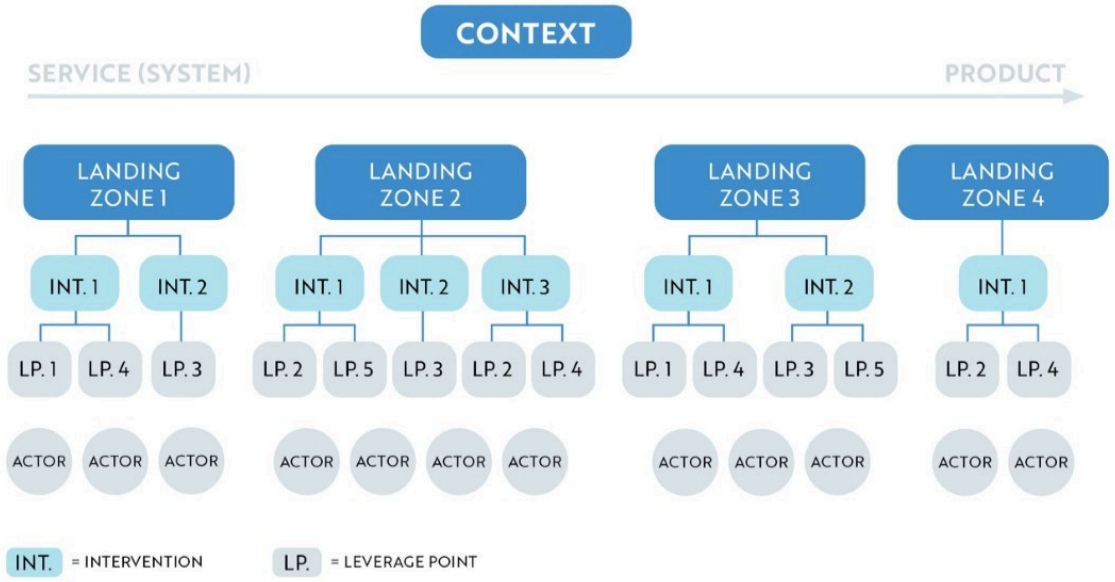


Figure 2. Template of the second version of the Landing Zones tool.

The Landing Zones tool is designed to support systemic designers in bridging the critical gap between synthesis and idea generation, a challenge often encountered when addressing complex societal issues. More specifically, the tool aims to translate identified leverage points into intervention strategies, by delineating the possibility space in three key dimensions: the range between systemic interventions and product solutions, leverage points, and actors. By structuring the possibility space into distinct

Landing Zones, the tool encourages a design-oriented mindset while mitigating the sense of paralysis that can arise from information overload.

Figure 2 shows the template of the Landing Zones tool. At the top of the template, designers define the context of the complex issue they are addressing in a short sentence, building on the analysis phase they just finished. Directly below, a horizontal spectrum is introduced, ranging from system/service-oriented interventions on the left to product-oriented solutions on the right. Each Landing Zone placed along this spectrum represents an intervention channel. This is a cluster of interconnected interventions rather than a single design output. To deepen understanding and assess the potential impact of these channels, the next layer of the tool focuses on leverage points and actors. Designers are prompted to zoom in and identify which leverage points each intervention addresses, allowing for critical reflection on the extent to which the intervention channel operates at the intended systemic levels. In parallel, the tool incorporates an actor analysis, helping designers determine which actors are targeted by each intervention. This encourages a better understanding of those affected by and involved in the proposed intervention channels.

Results of student survey

As discussed in the methods section, the students with a systemic design master's thesis project in academic year 2023-2024 and 2024-2025 were asked to fill out a survey about the Landing Zones tool. The results from the survey are discussed in the paragraphs below. All quotes in the text are in italic and come from the students' answers on the open questions in the survey.

Purpose of tool and added value

As expected, most of the students (5) chose to use the tool with the purpose of lowering the threshold from analysis phase to design phase. They mention that the tool helped them to zoom in on the considerable amount of information they had uncovered in the systemic analysis in a designerly way, and bridge towards specific interventions without losing overview over the project. A student puts it well: "[the tool helped me] to change gears from research brain to design brain". In that way, the Landing Zones also have added value in the limited time of the master's thesis project: the tool made it possible

to make progress and accelerate a phase that is seen by all students as notoriously difficult.

Some students also valued the tool in the explorative part of the design phase, to reframe their intervention ideas into a cohesive design concept (2) or to compare between intervention ideas by putting them on a range from systemic interventions to product solutions (3). Systemic design projects do not have one perfect solution, so the tool brought structure and clarity: "In a systemic design project, you often think that the only possible final solutions are a system on one side of the spectrum or a product on the other side. [With the tool] I learned about the whole spectrum of interventions and coupled each of them with the actors in the system. I created a good harmony by combining a system with a product that works together instead of existing parallelly."

This function of the tool to create an overview of their design interventions was also valued by one student who wanted to work in a more goal-oriented way, by picking out interventions that create an innovation opportunity compared to the existing landscape. Another student used the landing zones as a planning tool, to decide which design interventions would be possible to detail out in the limited time of the thesis.

Timing of application in the process

All students used the tool in the explorative design phase, after finishing the systemic analysis and before detailing out the design interventions. They did give more nuanced answers on where exactly in the exploration they saw possibilities for the tool: one student used the tool right before starting the exploration phase, to make a synthesis of the analysis phase and create an overview of the existing interventions in the current landscape, so they could uncover innovation opportunities to start their design exploration. The majority of the students (5) used it as an actual creative-explorative tool, to conceive a broad range of interventions on the spectrum between systemic and product solutions and shape them into cohesive concepts or intervention-clusters. Lastly, one student used the tool at the end of the explorative design phase, right before they started detailing out the final design concept: "I was at a point where I didn't know how to go forward. You have a vague idea of the final design concept but detailing it becomes very hard. The tool stimulated me to open up the solution space and rearrange the possibilities."

When asked in which phase they would use the tool now, when looking back, the students confirm that this explorative design phase is the most interesting part of the design process to use the Landing Zones: "if I would have used the tool earlier in the process, I think I would miss information and if I would have used it later, I would be floating between ideas for even longer." If anything, they would move the use of Landing Zones forward, to be more goal-oriented and make decisions earlier in the process. One student said the tool could be interesting to brainstorm in a co-creative way and without reducing the complexity of the project: "... to efficiently create a range of solutions on different levels of complexity with others and not be stuck on the surface level, which is often the case in brainstorms with people who are less knowledgeable about the topic."

Impact of the tool on the design process

The opinions of the students about the impact of the Landing Zones are divided: 3 students mention that they mostly see an indirect impact on their final concept, while 3 others do imply that using the tool made their final concept more relevant and helped them to avoid "boring or useless" outcomes. The students who see a more indirect impact, say that if they used the Landing Zones in a more structured way or used it earlier on in the process (when the solution space still had more degrees of freedom), the tool would have been less overwhelming and the impact on the final phase of the master's thesis project would have been bigger. Although we see different opinions on the impact of the Landing Zones, all 7 students say they would use the tool again in a similar design process. Most of them would use the tool again for the reasons mentioned above, but one student sees an opportunity to use the Landing Zones to communicate the possibilities of systemic design interventions to a client.

Suggested improvements on the tool

The students' suggested improvements can be categorized in three parts: (i) 2 students mentioned that the explanation of the tool was insufficient and suggested to give more examples when learning about the tool, (ii) 3 students said they would approach the range between systemic solutions and product solutions differently, and (iii) 2 students had ideas on different ways to visualise the involved actors.

Regarding the way the Landing Zones tool was offered to the students, 2 students mentioned they would have liked to see how the tool can be used in different parts of the design process, with more examples of the filled-out tool so they could picture better why the tool could be useful in their project. They also would have liked more support in exploring the solution space between product interventions and systemic interventions, to boost creativity and innovation. One student still felt lost after using the tool and asked for support in decision-making based on the filled-out Landing Zones.

The range between product interventions and systemic interventions was called into question by two other students: "By bringing together and rearranging loose ideas, I got a lot of different concepts and the placing on the scale from systemic to product was rather arbitrary, since most of my solutions were systemic or service focused. Maybe the tool would have been more useful if I used a different spectrum to arrange my ideas on." The other student suggested using the tool in different iterations, each with another predefined range. They mentioned that the 12 leverage points of Donella Meadows (1999) could be an interesting range too. The suggestion to use the tool in different iterative versions was echoed by another student, who saw an opportunity in using the tool first to present existing solutions in a structured way, and a second time for new and innovative interventions.

Finally, 2 students wanted to see different ways to visualise the involved actors in each Landing Zone: "it's useful that the involved actors are to be filled out at the bottom of the template, but because they are at the bottom, they get lost. How could you integrate the actors better with the information at the top of the template?" Adding to that, the other student said that "as the template suggested, I added the involved actors in each landing zone, but I didn't feel like involving some actors more than others was an added value in the final solution, so I don't know if this part of the tool was useful."

Discussion & conclusion

In this section, the survey results are reflected on first, after which we propose an improved version of the Landing Zones based on the students' feedback.

Purpose of tool and added value

Students reported that the Landing Zones tool supported them in exploring the possibility space. It enabled them to access their design mindset and consider a broader spectrum of potential intervention clusters. Activating this mindset has the potential to reduce knowledge paralysis but also foster greater creativity. By guiding students to expand the range and nature of their intervention channels, the tool encourages engagement with diverse system levels, leverage points, and actor relationships, aiming to enrich the depth and breadth of their design explorations.

Timing of application in the process

All participating students mentioned using the Landing Zones tool during the design phase of their thesis projects. Someone specifically noted its use at the beginning of this phase, to help transition from synthesis to initial concept development. In contrast, someone else applied it later, as a bridge towards a more detailed design. This aligns well with the tool's intended purpose: to support the shift from systemic analysis and synthesis to the idea generation phase.

However, it's important to acknowledge the critical consideration that the tool was deliberately introduced to students at this specific stage of their thesis process. Therefore, their positive feedback may partly reflect the timing and framing of its introduction. To counter this bias, it would be valuable to present the tool earlier in the thesis trajectory, allowing students to engage with it in a more tailored and independent way. This would help determine whether its perceived value remains centred on the synthesis-to-design transition, or if students adapt and extend its use across other steps of the systemic design methodology.

Another noteworthy point is that while the tool is primarily positioned as a brainstorming aid, its functionality could be expanded. Once multiple intervention channels have been identified, the tool could play a stronger role in guiding users towards a well-reasoned selection. Introducing a feedback mechanism, such as trade-off criteria, would allow users to critically assess and compare their intervention options, adding an evaluative layer to the creative process and reinforcing the relation between idea generation and decision-making.

Impact of the tool on the design process

The results highlight several reasons why students would reuse the Landing Zones tool. However, they also reveal critical reflections on the tool's contribution to the desired impact of the final concept. These reflections align with the four dimensions of impact defined by Moons et al., (2025): (1) the impact of the process on actors, (2) the impact of the result on the context, (3) the impact of the student on the process and outcome, and (4) the impact of the process and outcome on the student. Most feedback falls into the latter two categories. Considering (3) the impact of the student on the process and outcome, in earlier work (Moons et al., 2025), students expressed feelings of powerlessness due to limitations in knowledge, resources, and time. These sentiments echoed in the current study, with one student remarking, "it's still only a tool.", helping to create clarity, yet limited in scope. Its application depends on when it's introduced and is limited to one phase of the process, offering only partial support and limited control across the full thesis trajectory. A critical remark here is that the systemic design methodology has a steep learning curve. While a single tool may support students in navigating this complexity, the challenge is inherent to the nature of the process itself. The remaining student reflections relate to the fourth category: the impact of the process and outcome on the student. As described by Moons et al., (2025), students following a systemic design approach shape and are shaped by their projects. In the current study, the influence of the tool on the students is also recognised, with students sharing that the tool helped to maintain an open perspective on all design opportunities, to remain aware of potential impact, and to push for more innovative, meaningful outcomes. These insights suggest that the tool fosters a sense of systemic awareness, which students are likely to carry forward into future projects.

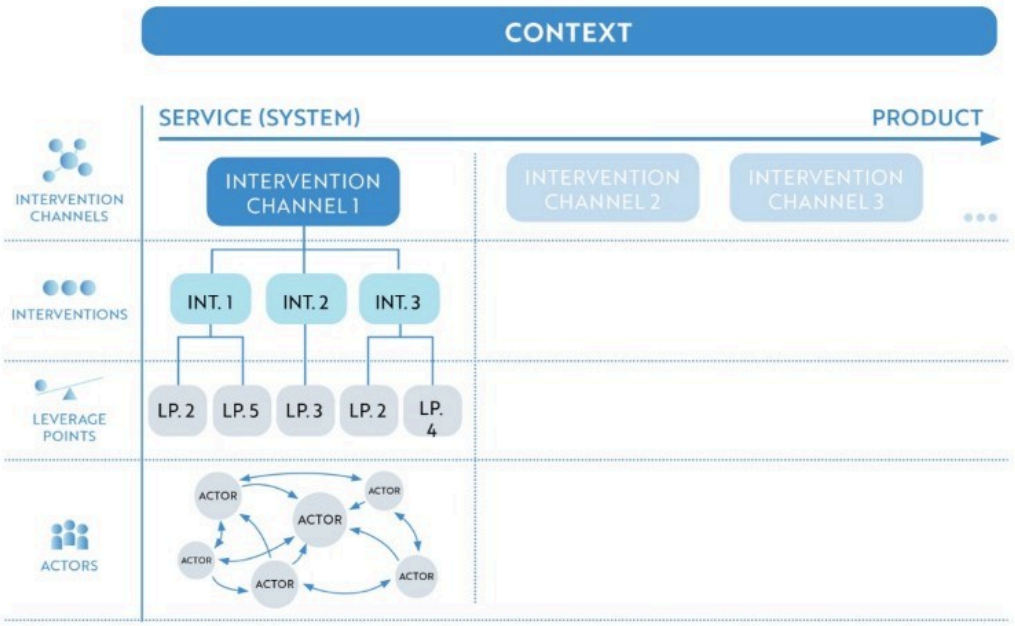
The improved tool

Based on feedback from participating students and subsequent internal discussions, we present a revised version of the Landing Zones tool (Figure 3). Several improvements have been made. First, the tool now has a more detailed description and user manual. We suggest that the tool is introduced at the beginning of the systemic design process. Second, greater emphasis is placed on embedding actors and their interrelationships or value exchanges. Third, trade-off guidelines have been added to support users in making well-informed decisions.

Additionally, some students suggested other ranges for the horizontal scale or to leave the scale open for the designers to fill out. After consideration, we decided to retain the original scale, from service(system)-oriented to product-oriented. By using this scale, designers not only explore the possibility space in terms of needs of the actors or design specifications like in regular product design processes, but they also explore the possibilities of different assemblies of interventions and think about the ways to integrate product solutions with service or systemic interventions. However, we encourage users to adapt the tool and scale to fit their specific context and approach. It's also worth noting that as one moves towards the product-oriented end of the scale, the complexity of intervention channels decreases. This improved version of the tool is developed through an iterative study, but due to the limited number of systemic design master's students, the participant sample remains small. In future research further iterations and testing cycles are necessary to assess the impact of the tool on the design process.

LANDING ZONES

The Landing Zones tool bridges the gap between synthesis and idea generation. The tool aims to translate identified leverage points into intervention strategies, by delineating the possibility space in three key dimensions: system, service or product orientation, leverage points, and actors.



STEPS

1. Define the context or problem scope.
2. Brainstorm intervention channels on a spectrum from more system or service oriented to more product oriented.
3. For each intervention channel, brainstorm (connected) interventions.
4. Identify for each intervention on which of your system's leverage points they intervene.
5. Identify the addressed actors for each intervention channel. Use the frame to make an actor map of the actors, indicate with arrows the type of relation and the exchanged value.

TRADE-OFF

Leverage points
Which leverage points are addressed by your chosen intervention channel?
Which leverage points aren't addressed and is this justified?
Actors
Are all relevant actors included in the chosen intervention channel?
What are the different relationships and values between the included actors?
Do the intervention channels provide for a diversity of relevant actors?
Interventions
Are the interventions of an intervention channel inter(connected)?
To what degree is there a combination of more service(systemic)-oriented and product-oriented interventions?

Figure 3. Template of third version of the Landing Zones tool.

References h2

Andersson, C., & Törnberg, P. (2018). Wickedness and the anatomy of complexity. Futures, 95, 118-138. https://doi.org/10.1016/j.futures.2017.11.001

Bijl-Brouwer, M. van der, & Malcolm, B. (2020). Systemic Design Principles in Social Innovation: A Study of Expert Practices and Design Rationales. She Ji, 6(3), 386-407. https://doi.org/10.1016/J.SHEJI.2020.06.001

Den Ouden, E. (2012). Innovation design: Creating value for people, organisations and society. In Innovation Design: Creating Value for People, Organisations and Society (Vol. 1). Springer London. https://doi.org/10.1007/978-1-4471-2268-5/COVER

Frayling, C. (1993). Research in Art and Design. Royal College of Art Research Papers, 1, 1-5.

Jones, M., Abatzoglou, J., Veraverbeke, S., Andela, N., Lasslop, G., Forkel, M., Smith, A., Burton, C., Betts, R., Werf, G., Sitch, S., Canadell, J., Santín, C., Kolden, C., Doerr, S., & Le Quéré, C. (2022). Global and Regional Trends and Drivers of Fire Under Climate Change. Reviews of Geophysics, 60. https://doi.org/10.1029/2020RG000726

Jones, P. H. (2014). Systemic Design Principles for Complex Social Systems. 91-128. https://doi.org/10.1007/978-4-431-54478-4_4

Jones, P., & Van Ael, K. (2022). Design Journeys through Complex Systems. BIS publishers. https://www.bispublishers.com/design-journeys-through-complex-systems.html

Kurtz, C. F., & Snowden, D. (2003). The new dynamics of strategy: Sense-making in a complex and complicated world. IBM Systems Journal, 42, 462-483. https://doi.org/10.1147/sj.423.0462

Meadows, D. H. (1999). Leverage Points: Places to Intervene in a System. The Sustainability Institute. https://donellameadows.org/archives/leverage-points-places-to-intervene-in-a-system/

Moons, S., Gruyters, M., & Jacoby, A. (2025). Rapids And Waterfalls: The co-creative process of guiding systemic design master's thesis projects. RSD13, Oslo. [Manuscript submitted for publication]

Norman, D. A., & Stappers, P. J. (2015). DesignX: Complex Sociotechnical Systems. She Ji: The Journal of Design, Economics, and Innovation, 1(2), 83-106. https://doi.org/10.1016/j.sheji.2016.01.002

Ryan, A. (2014). A Framework for Systemic Design. FormAkademisk - forskningstidsskrift for design og designdidaktikk, 7(4). https://doi.org/10.7577/FORMAKADEMISK.787

Sharpe, B., Hodgson, A., Leicester, G., Lyon, A., & Fazey, I. (2016). Three horizons: A pathways practice for transformation. Ecology and Society, 21. https://doi.org/10.5751/ES-08388-210247

Authors h2

Maud Gruyters, PhD researcher, University of Antwerp, maud.guyters@uantwerpen.be

Stine Moons, PhD researcher, University of Antwerp, stine.moons@uantwerpen.be

Ivo Dewit, Post-doc researcher, University of Antwerp, ivo.dewit@uantwerpen.be

Alexis Jocoby, Professor, University of Antwerp, alexis.jacoby@uantwerpen.be