Systemic Mapping and Design Research: Towards Participatory Democratic Engagement

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Abstract

This article presents an argument to extend possibilities and discussions about the role of design in democratic participation. We ground this argument in case studies and observations of several grassroots experimental participatory design workshops run with the intention of producing spaces for community deliberation and a tangible transformation of these communities. These cases show how systemic mapping and prototyping are used to increase community understanding of how potential futures represent values systems that should correspond to the values the community would like to see in place. The methodologies used on these workshops are presented it here as an opportunity to question the role of design in democratic deliberation and policy making.

1   Herbert A. Simon, *The Sciences of the Artificial*, 3rd ed. (Cambridge, MA: MIT Press, 2019), 128.

2   Bela H. Banathy, *Designing Social Systems in a Changing World* (New York: Springer Science & Business Media, 2013), 16, DOI: https://doi.org/10.1007/978-1-4757-9981-1.

3   Peter H. Jones, "Systemic Design Principles for Complex Social Systems," in *Social Systems and Design*, ed. Gary S. Metcalf (Tokyo: Springer, 2014): 94, DOI: https://doi.org/10.1007/978-4-431-54478-4_4.

4   Ludwig von Bertalanffy, *General System Theory: Foundations, Development, Applications* (New York: Georges Braziller, Inc., 1968).

5   Birger Sevaldson, "Redesigning Systems Thinking," *FormAkademisk — forskningstidsskrift for design og designdidaktikk* 10, no. 1 (2017): online, DOI: https://doi.org/10.7577/formakademisk.1755.

6   Susanne Bødker and Kaj Grønbæk, "Cooperative Prototyping: Users and Designers in Mutual Activity," *International Journal of Man-Machine Studies* 34, no. 3 (1991): 453–78, DOI: https://doi.org/10.1016/0020-7373(91)90030-B.

7   Ezio Manzini and Francesca Rizzo, "Small Projects/Large Changes: Participatory Design as an Open Participated Process," *CoDesign* 7, no. 3-4 (2011): 199, DOI: https://doi.org/10.1080/15710882.2011.630472.

8   Susanne Bødker, "Prototyping Revisited: Design with Users in a Cooperative Setting," *DAIMI Report Series* 233 (1987): 9, DOI: https://doi.org/10.7146/dpb.v16i233.7589.

9   Robert Jungk and Norbert R. Müllert, *Future Workshops: How to Create Desirable Futures* (London: Institute for Social Inventions, 1987).

10 Banathy, *Designing Social Systems*.

11 Jones, "Systemic Design Principles," 91–128.

12 Helen Ingram and Anne Schneider, "Constructing Citizenship: The Subtle Messages of Policy Design," in *Public Policy for Democracy*, ed. Steven Rathgeb Smith and Helen Ingram (Washington, DC: The Brookings Institution, 1993), 72.

13 Chris Skelcher, Navdeep Mathur, and Mike Smith, "The Public Governance of Collaborative Spaces: Discourse, Design and Democracy," *Public Administration* 83, no. 3 (2005): 576, DOI: https://doi.org/10.1111/j.0033-3298.2005.00463.x; Joe Soss, "Lessons of Welfare: Policy Design, Political Learning, And Political Action," *The American Political Science Review* 93, no. 2 (1999): 376, DOI: https://doi.org/10.2307/2585401.

14 Carolyn M. Hendriks, "Policy Design without Democracy? Making Democratic Sense of Transition Management," *Policy Sciences* 42, no. 4 (2009): 342, DOI: https://doi.org/10.1007/s11077-009-9095-1; Lucy Kimbell, "Applying Design Approaches to

Introduction

Herbert Simon,[1] Bela Banathy,[2] and Peter Jones[3] would likely agree that there is a profound connection between General System Theory,[4] the systemic approach, and the design process. We could argue that, as Birger Sevaldson[5] states, design is a systemic discipline by nature and a systemic essence pervades knowledge foundational to design. Many collaborative design methods, such as participatory or cooperative design[6] and codesign,[7] were born from this awareness, as was the use of prototypes to envision possible futures collaboratively with stakeholders.[8]

Collaborative and social design practices, like the ones mentioned above, have been vital to the development of the discipline and have helped design activity expand beyond artifact production to include complex problem definition.

More and more designers are participating in projects whose central aim is social transformation. The work of Robert Jungk and Norbert Müllert[9] involving communities in a deliberative process of envisioning the future and Banathy's structured approach[10] to the active transformation of society have been instrumental to defining this new relationship between design and complex social systems, and have paved the way for social innovation as a space for design thinking and research.[11] Design for policymaking has also become a new area of research and development for scholars and practitioners,[12] opening the space for design practices to be involved in the construction of policies[13] that can pave the way towards an envisioned future.[14] In many of these cases, design was introduced as a last resort after other efforts had failed.

Gjoko Muratovski[15] has described the evolution of the design discipline as a series of paradigm shifts that include a transition from craftsmanship to industrialization and from production-oriented economies to service-based ones. Fabrizio Ceschin and Idil Gaziulusoy[16] identify a similar evolution—from product innovation to product-service system innovation to spatial-social innovation to sociotechnical systems innovation—in the design for sustainability discipline. It is safe to say that one of the most profound transformations in the (still young) discipline of design has taken place over the last 30 years: increasing awareness of the role it can play in societal transformation.

Every mechanism within a particular system, be it transportation or communications, now receives meticulous attention to its design. In business, the era of products has given way to the era of services.[17] As companies expand their activities to focus on product-service systems, they have reached out to design for insight into everything from customer engagement[18] to innovation processes,[19] organizational culture,[20] and brand interaction.[21] At the same time, "social innovation" has become the latest trend among entrepreneurs at think tanks and fledgling startups, and even inside large corporations.[22]

Despite some recent advances towards greater societal inclusion, participation, and representation, deeply systemic issues seem to be causing democratic systems to fail[23]—and design might be one of the parties responsible. Author Anand Giridharadas[24] suggests that contemporary failures in the democratic process could be caused, in part, by the profound social inequities

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chonline.arts.ac.uk/id/eprint/9111/2/
Kimbell_PolicyLab_report.pdf.

15 Gjoko Muratovski, "Paradigm Shift: Report
on the New Role of Design in Business
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Economics, and Innovation* 1, no. 2 (2015):
118–39, DOI: https://doi.org/10.1016/j.
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16 Fabrizio Ceschin and Idil Gaziulusoy, "Evo-
lution of Design for Sustainability: From
Product Design to Design for System In-
novations and Transitions," *Design Studies*
47 (November 2016): 123, DOI: https://doi.
org/10.1016/j.destud.2016.09.002.

17 Faïz Gallouj, *Innovation in the Service
Economy: The New Wealth of Nations*
(Cheltenham: Edward Elgar Publishing,
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P. Kaboski, "The Rise of the Service
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https://doi.org/10.1108/JBIM-11-2017-0286.

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tion: Changing the Rules of Competition by
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(Boston, MA: Harvard Business Press,
2009), 11; Vijay Kumar, *101 Design Methods:
A Structured Approach for Driving Innova-
tion in Your Organization* (Hoboken, NJ:
Wiley, 2012), 3.

20 Martin Ringer and Phil Robinson,
"Focus and Strategic Action in Man-
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of Organizational Culture to Inform
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org/10.1108/00438029610129041.

21 Alain d'Astous and Ezzedine Gargouri,
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35, no. 1/2 (2001): 158, DOI: https://doi.
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22 Tim Brown and Jocelyn Wyatt, "Design
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ment Outreach* 12, no. 1 (2010): 32, DOI:
https://doi.org/10.1596/1020-797X_12_1_29.

23 Des Freedman, "Populism and Media Policy
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tion* 33, no. 6 (2018): 607, DOI: https://doi.
org/10.1177%2F0267323118790156.

24 Anand Giridharadas, *Winners Take All:
The Elite Charade of Changing the World*
(London: Penguin/Vintage Books, 2019).

and resource hoarding that characterize today's societies and a version of
"social innovation"—championed by design—that seeks to ameliorate the
condition of various populations without challenging the overall structure
of the socioeconomic system. Other authors like Maria Mazzucato[25] suggest
that new ideologies supported by neoliberal capitalism have reinforce the
idea of a failure of the public system to their benefit, concealing the truth
about the public foundations that permitted the growth of the free market.
Natasha Iskander[26] suggests that the practice of adapting design tools
to various innovation contexts—something embraced in design for the
in-company validation it confers—has meant the preservation of a status
quo that favors those in power, and thus the perpetuation of the societal
inequalities inherent within it.

The growing concern over the apparent failure of our democratic sys-
tems has led the design community to wonder about how design might
contribute to a redefining of democratic models,[27] and some very inspiring
ideas. Mariam Asad,[28] for example, makes the case for a prefigurative design
practice that more consciously embodies the future societal norms it seeks
to explore, while Terry Irwin, Gideon Kosoff, and Cameron Tonkinwise[29]
describe the need for design to facilitate a transition into a new way of
inhabiting the world.

In this article, we argue that one of the main weaknesses of the current
democratic system is its inability to generate a shared vision of the future, or
even common scenarios where different notions of the future might coexist.
We present a series of contemporary experimental practices grounded in
participatory, community-based action, all of which seek to produce a better
generalized understanding of possible collective futures. Some of these
practices apply rather traditional methods in uncommon environments.
Some are more experimental and use conversational objects[30] as boundary
framing[31] mechanisms. The authors' real-world design practice within Latin
American communities serves as both the source of these examples and the
springboard for the exploration and analysis that follows.

Design and Policymaking

There are several key contributors to the policymaking process. Among
these are foresight, planning, law, economics, and, recently, design. We will
begin by defining the role design plays in policymaking more precisely, and
the relationship between design and democracy.

Design disciplines are grounded on the notion of transformation.
Simon's definition of design[32] implies that a new "course of action" to create
transformation is in order, not just a new idea. The transformative power
of design, in this sense, is in this act of "devising" an actionable plan, which
includes selecting the tangible mechanisms required to make the preferred
situation a reality. In a sense, it is this transformative aspect of design that
has earned the attention of other disciplines. It goes beyond the current
reality and proposes a concrete means through which to effect change.
One important part of the definition of these actions (or objects) is that,
although they do not exist in the present, they are agreed on by a group as

25   Mariana Mazzucato, *The Value of Everything: Making and Taking in the Global Economy* (New York: PublicAffairs/Hachette Book Group, 2018).

26   Natasha Iskander, "Design Thinking is Fundamentally Conservative and Preserves the Status Quo," *Harvard Business Review*, September 5, 2018, https://hbr.org/2018/09/design–thinking–is–fundamentally–conservative–and–preserves–the–status–quo.

27   Thomas Binder et al., "Democratic Design Experiments: Between Parliament and Laboratory," *CoDesign* 11, no. 3-4 (2015): 155, DOI: https://doi.org/10.1080/15710882.2015.1081248.

28   Mariam Asad, "Prefigurative Design as an Alternative Approach to Civic Engagement," in *Proceedings of CSCW '18:Companion of the 2018 ACM Conference on Computer Supported Cooperative Work and Social Computing* (2018): 97–100, DOI: https://doi.org/10.1145/3272973.3272983.

29   Terry Irwin, Gideon Kossoff, and Cameron Tonkinwise, "Transition Design Provocation," *Design Philosophy Papers* 13, no. 1 (2015): 4, DOI: https://doi.org/10.1080/14487136.2015.1085688.

30   Alan Galey and Stan Ruecker, "How a Prototype Argues," *Literary and Linguistic Computing* 25, no. 4 (2010): 405, DOI: https://doi.org/10.1093/llc/fqq021.

31   Jones, "Systemic Design Principles," 111.

32   Simon, *The Sciences of the Artificial*, 111. –

33   Harold G. Nelson and Erik Stolterman, *The Design Way: Intentional Change in an Unpredictable World: Foundations and Fundamentals of Design Competence* (Englewood Cliffs, NJ: Educational Technology Publications, 2003), 127.

34   Peter-Paul Verbeek, *Moralizing Technology: Understanding and Designing the Morality of Things* (Chicago: The University of Chicago Press, 2011), 90.

35   Peter-Paul Verbeek, "Technology Design as Experimental Ethics," in *Ethics on the Laboratory Floor*, ed. Simone van der Berg and Tjalling Swierstra (Basingstoke: Palgrave Macmillan, 2013), 95, DOI: https://doi.org/10.1057/9781137002938_5.

36   Langdon Winner, "Do Artifacts Have Politics?," *Daedalus* 109, no. 1 (1980): 128, available at https://www.jstor.org/stable/20024652.

37   Batya Friedman and Helen Nissenbaum, "Bias in Computer Systems," *ACM Transactions on Information Systems* 14, no. 3 (1996): 335, DOI: https://doi.org/10.1145/230538.230561.

38   Iskander, "Fundamentally Conservative," online.

preferable based on a process of deliberation; this nature of being actively on the verge of existence is defined by Harold Nelson and Erik Stolterman as not-yet-existing.[33]

This ability to creatively transform the world comes with a heavy dose of responsibility. Peter-Paul Verbeek[34] argues that design is the act of making ethics tangible, and has posited design as a form of experimental ethics.[35] However, as Langdon Winner[36] points out, the politics embedded into the artifacts we produce can affect certain communities negatively. Batya Friedman and Helen Nissenbaum[37] explain that object politics are based on human values embedded during the artifact development process that can lead to biases in the systems which may perpetuate discrimination.

As objects become ever more powerful mediators of our everyday lives, it would not be unreasonable to say that part of what design does is facilitate certain futures based on human values and politics. This premise places design at the forefront of policymaking, where it is used to create the social mechanisms and institutions that will fulfill the intentions of a given policy—and leads to, as Iskander[38] frames it, more of the status quo. This role is an important one for social good, when policies have been carefully crafted and considered, and when the interest and values they represent are based on the intention to enhance collective wellbeing and common goals.

But when design is used to benefit policymakers and specific intentions, and not the people most impacted by policy implementation, then there is some cause for concern in the field. Guillermo Aguirre-Núñez[39] writes about cases of democratic policymaking where the participatory design approaches used were not intended to facilitate the agency of the stakeholders or to empower them in the construction of their social environment—they were used to control the process and secure public validation for policy already in the works. An opinion survey can be little more than post-decision validation tool, rather than a tool for co-creation, co-construction and co-validation. And a user centered design practice can, in this way, limit stakeholder agency to mere acceptance of potentially minor modifications that appear to make an existing solution more acceptable.

If design seeks to produce new possibilities for the future, designers must weave individual agency into the definition—and defining—of that future. This perspective influenced the rise of participatory practices in Scandinavian countries. The political environment (social democracy), the ideal of democratic participation and improved worker agency, and the intention to support a collectively defined future led researchers like Susanne Bødker[40] and Kristen Nygaard and Olav Bergo[41] to propose approaches based on the democratic validation of stakeholder intentions.

How, then, do we design for a better society by empowering communities to become active decision makers for their futures? How do we move from the current models of opinion-based democracy that are so susceptible to being manipulated through demagogy and propaganda, to a carefully designed process of democracy that is founded on the distribution of agency and a co-created intent for a better future?

In an effort to define the potential role design might play in societal transformations, Banathy[42] devised a design process model for complex

39 Guillermo Aguirre Núñez, "Citizen Partic-
ipation in a Neoliberal Context: 'Empty
Ritual or Real Power?'" (master's thesis,
Aalborg University, 2018), 26, available
at https://projekter.aau.dk/projekter/
files/280912414/Guillermo_Aguirre_Mas-
ter_s_thesis.pdf.

40 Bødker, "Prototyping Revisited," 2.

41 Kristen Nygaard and Olav Terje Bergo,
"The Trade Unions — New Users of Re-
search," *Personnel Review* 4, no. 5 (1975): 5,
DOI: https://doi.org/10.1108/eb055278.

42 Banathy, *Designing Social Systems*, 75.
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43 Design Council, "What is the Framework
for Innovation? Design Council's Evolved
Double Diamond," March 17, 2015, https://
www.designcouncil.org.uk/news-opinion/
what-framework-innovation-de-
sign-councils-evolved-double-diamond.

44 Voros, "Generic Foresight," 16.

45 Juan Alfonso de la Rosa and Stan Ruecker,
"Using Prototypes to Produce High-Reso-
lution Systemic Future Maps: A Proposed
Model for Design Research and Knowl-
edge," *Bitácora Urbano Territorial* 30, no. 2
(2020): 97, DOI: https://doi.org/10.15446/
bitacora.v30n2.81801.

Figure 1
Combining the models of Voros and Banathy
reveals the non-linearity of the design process
and the conscious, ongoing discernment of a
path to a preferred future. © 2020 by de la Rosa
and Ruecker. Source: De la Rosa and Ruecker,
"Using Prototypes to Produce High-Resolution
Systemic Future Maps," 97, figure 4.

social systems transformation that became the basis for the Design Council's
Double Diamond[43] and other novel design thinking models. In his model,
Banathy introduces the idea of design cycles: iterations between the vision of
the preferred future and the model or plan that makes that vision possible.
His model has been instrumental to our understanding of how design can
involve communities in the definition of their futures and in doing so, better
acknowledge their agency.

One of the issues with Banathy's model is that it represents time and
process as linear, which creates the false idea that each step automatically
leads to that future, with no hiccups or need for sudden course adaptations
along the way. The model presented by Joseph Voros[44] portrays design as
an attempt to transform a current path into a more desirable one. It accom-
modates the possibility for changes of direction that imply an effort or force
added to the system, as any modification to the inertia of a movement will
do. According to Juan de la Rosa and Stan Ruecker,[45] a combination of the
two models could represent a more accurate portrayal of design (Figure 1),
as it also allows us to see that throughout the whole design process there is
the constant intention to find a new direction and discern possible catalysts to
facilitate its implementation.

Design, then, may very well be about the small course corrections that
allow the trajectory to be updated according to the ripples of an ever-changing
world and a diffuse long-term goal, as well as the game-changing, paradigm-
breaking events that can lead to systemic changes. Therefore, we argue that
when the goal is to foster a preferred course correction, the designer's job is to

- identify and acknowledge the intentions of the people involved in the
  definition of that future,
- empower those without voice to redistribute the systemic balance of
  agency and serve the common good;
- facilitate a true forum for democratic deliberation, and
- critically review the unintended consequences that intended transforma-
  tions may have at every level of a system.
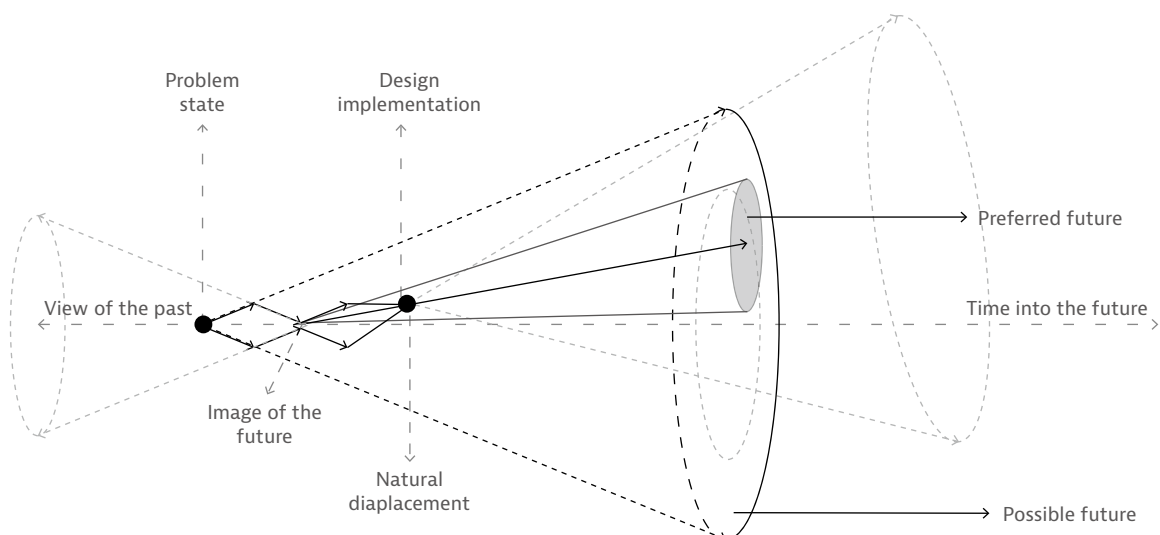
46 Bødker, "Prototyping Revisited," 2.

47 Juan Alfonso de la Rosa, Karolina Kohler, and Stan Ruecker, "Prototyping as a Resource to Investigate Future States of the System," in *Proceedings of Relating Systems Thinking and Design (RSD6) 2017 Symposium*, ed. Birger Sevaldson (Oslo: Systemic Design Research Network, 2018), 12, https://systemic-design.net/rsd6/systemic-design-theory-and-methods/#rosa.

48 Galey and Ruecker, "How a Prototype Argues," 413.

These tasks require hybrid methods of research and possibly a new approach.

Research Methodology

As described before, this paper has its origins on a series of community-based workshops facilitated by the authors with communities in Colombia that were trying to define the limits of projects of public infrastructure that was meant to be implemented on their living spaces. The intention of these workshops was to support communities on a better definition of the objectives of their projects for the future.

Establishing the structure of that preferred future is a complex task, because it is not a prediction based on trends or a probable scenario. One thing we know about design in this context is that its intention is to provide an original course of action toward a preferred result. Any intent to predict that preferred result based solely on trends or probability will not incorporate the visions and needs of stakeholders at every level of a system. Bødker[46] advances prototypes as tools that make possible futures more tangible to stakeholders, enabling us to capture some of the reactions and impressions a possible future might produce. This input is instrumental to the process of deliberating over and envisioning possible, emerging social structures.

Based on these considerations, we decided to use a tool presented by Juan de la Rosa, Karolina Kohler, and Stan Ruecker[47] that involves high-resolution mapping of a preferred future with the aid of prototypes. We argue that using this tool in participatory workshops—where communities benefit from greater democratic engagement—allows us to more clearly discern the tacit intentions, values, and consequences of possible futures, and incorporate collaborative conversation and critique around the meanings implied by a preferred future.

De la Rosa, Kohler, and Ruecker developed the model (Figure 2), proposing a series of intentionally displaced prototypes during the research phase of the design process. This tool helps designers to produce information on ideas of preferred future states. The idea of displacement is central to the model. It recommends intentionally focusing the design work at the periphery of the initial problem definition. The purpose is to observe unexpected connections and repercussions, looking into the future beyond the intended goal to generate different perspectives on the process. We interpret this displacement of the original goal as the inclusion of diverse community views of the future. The systemic map is a tool for deliberation. In this design method, prototypes serve as conversational objects[48] forming the basis for open dialogue about desirable futures. They help to reveal the connections between and among those preferences.

One significant advantage to using the participatory settings created by participatory action research and participatory design is that there already exists a corpus of knowledge and a certain degree of recognition of their value within the qualitative sphere of the social sciences. Therefore, the use of experimental design research methodologies has a better foundation, and the idea of a method that seeks to recognize different points of view aligns
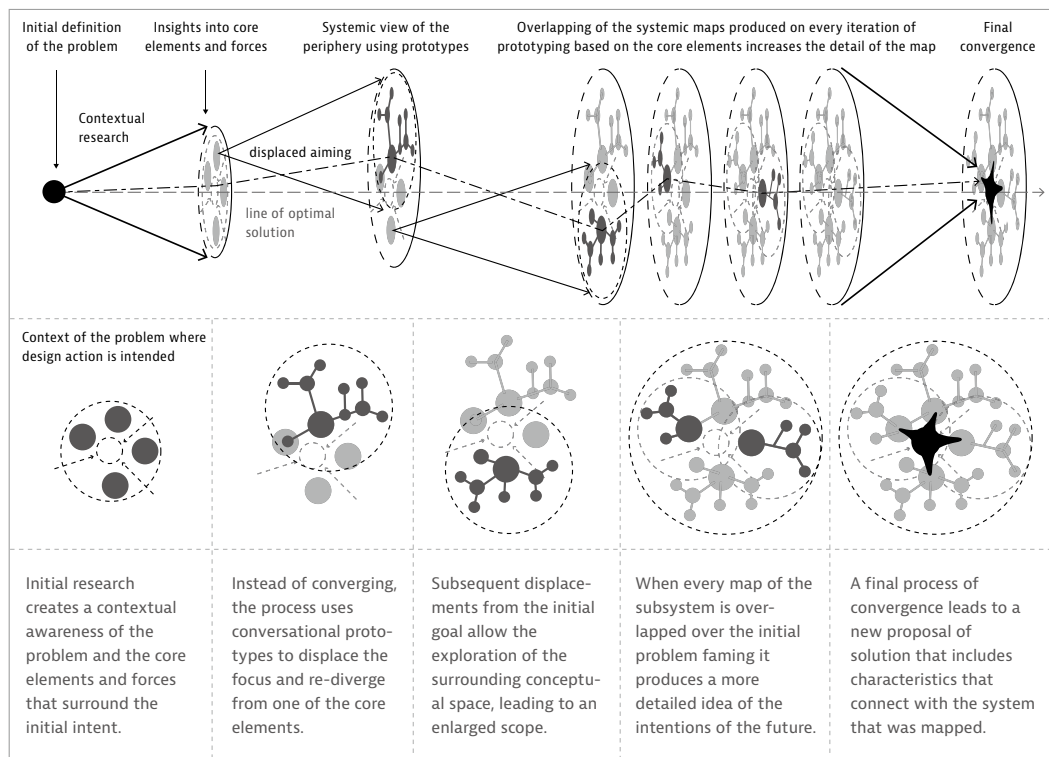
Context of the problem where design action is intended				
Initial research creates a contextual awareness of the problem and the core elements and forces that surround the initial intent.	Instead of converging, the process uses conversational prototypes to displace the focus and re-diverge from one of the core elements.	Subsequent displacements from the initial goal allow the exploration of the surrounding conceptual space, leading to an enlarged scope.	When every map of the subsystem is overlapped over the initial problem faming it produces a more detailed idea of the intentions of the future.	A final process of convergence leads to a new proposal of solution that includes characteristics that connect with the system that was mapped.

Figure 2
The model of displaced prototypes in multi-layered images. Developed from De la Rosa, Karolina et al., "Prototyping as a Resource to Investigate Future States of the System," 12. © 2021 by Juan de la Rosa, Stan Ruecher, and Carolina Giraldo Nohora.

with the idea that human reality cannot be defined from a completely objective perspective and that the views, perceptions, and intentions of every actor of the process profoundly impact what is defined as real.

This principle belongs to the heritage of systemic theories that includes participatory action research and participatory design. Bødker[49] proposed one of the first approaches to participatory (collective) design with the awareness that complex social systems cannot be defined, mapped, or transformed without the participation of those who will be impacted by the process and result. With this in mind, we collaborated with some ongoing community projects by leading workshops in different settings where the goal was to map the intentions of a community for a future change to observe how these communities self-determined their desirable path. Below we present two of these workshops as case studies.

Case Studies

We observed and analyzed the processes and results of a series of workshops held with communities across three different projects in Colombia. The authors (independently or severally) participated in all the workshops as designers or facilitators. The main goal of these workshops was to map values

49   Bødker, "Prototyping Revisited," 17.

50   De la Rosa et al., "Prototyping as a
     Resource," 11.

and intentions for the future of the communities participating based on the ideas presented by de la Rosa, Kohler and Ruecker,[50] and the tools and methods used were slightly modified versions of common design methods, like storytelling, prototyping and mapping.

The first workshop took place as part of a community project in the city of Bogotá. Government and community-based organizations were working towards the ecological restoration of a *humedal*—the Spanish term referring to a specific ecosystem of wetlands that works as a biofilter and water reservoir. Their main concern was the physical definition of a library/research space for the community, and so we decided to start a new participatory design cycle to identify potentially divergent views of the future in that context. The project represents a very successful example of government and community collaborating to achieve a common goal. The ongoing collective effort—uniting community stakeholders with actors from public and private institutions—has been operating in the region for more than twenty years with the intention to produce long lasting ecological and social restoration.

We became involved in the project after an invitation to observe a series of workshops designed to foster the collaborative design process of a community library/center. These participatory workshops, which included stakeholders and decision makers, very much aided the collective definition of goals and construction of an environment of collaboration and trust. The potential to generate this collective, collaborative mindset in participants is, to us, one of the most positive effects of any participatory process.

Right from the start, we noticed a series of factors present in this participatory design process that we believe are very common to the practice, and which we included in our research focus. The first of these was the way the project participants had defined their notion of *stakeholder*. In this case, the roster of actors was limited to those with decision making powers conferred by rank or expertise, and while many community members were involved, potential actors from other communities were perceived as either neutral/external to the process or as obstacles to it. During this initial set of workshops, we noticed that the stakeholder map was limited to the participants and their interests, or its parameters confined to the current state of the problem. This is the first time a conversation about agency and democracy might appear, and where the role design plays in making these silent voices visible to the participants emerges.

The second factor was the group's desire to reduce uncertainty in the process and settle upon a viable solution. Typically, the main objective of any design project (for most of the people involved) is to define and develop a solution to a problem. Once a possible solution is proposed, there is a tendency to stick to that solution as the final goal of the design process. This very common approach often leads to the development of prototypes that are not much more than beta versions of a given solution. This limits the potential prototypes have to act as discursive or conversational objects that facilitate interrogation and analysis of the goal itself, not just the proposed solution. In these settings, it becomes the responsibility of the facilitators to resist that tendency by inviting ways to reframe the definition of the problem as well.

Figure 3
Map of the values and stakeholders produced using narratives of the future as conversational objects. © 2019 by Carlos Andrés Garzón.
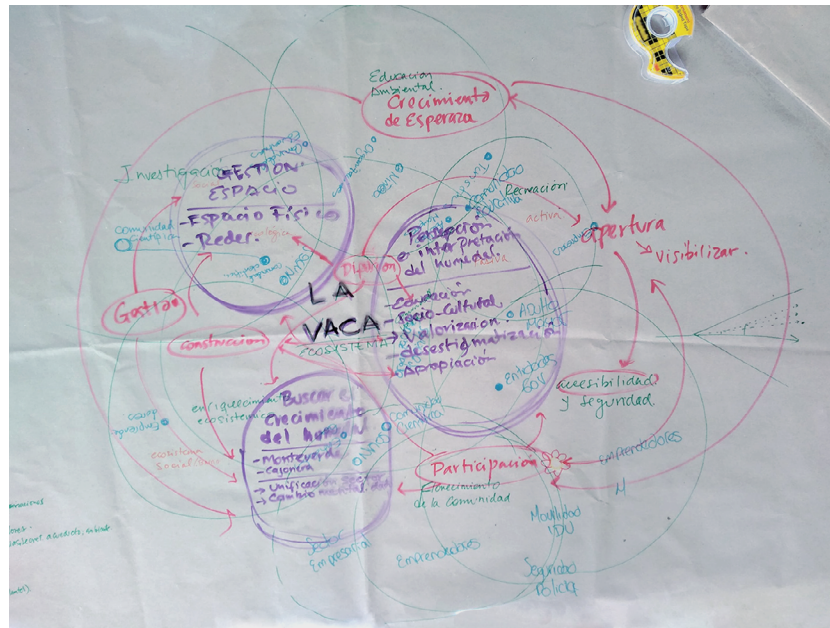
Even though, in the literature and in practice, prototyping, narrative construction, or scenario building are often presented as separate methods, we see them as very related mechanisms for envisioning the future and use them interchangeably through the design research process as objects of a possible future. In this case, given the workshop setting, we decided to use future narratives as the prototypical objects of the future. We believe that these serve the same function as prototypes, since they are a temporary means of inhabiting future scenarios—even though they do not convey the same tangible properties that physical prototypes do.

Every participant was asked to produce a short narrative describing their preferred future state of the *humedal* and the possible relationships with the community that vision would entail. The resulting narratives revealed potential new actors and stakeholders to be included in the conversation, and enabled us to map out the values underlying the project and incorporate them as a fundamental part of the future vision (Figure 3).

Three overarching project values emerged—*building networks*, *the growth of nature*, and *sharing hope*—and with each, a different perspective of what the future of the community and the *humedal* could be.

Creating lasting change in community perceptions of the *humedal* was defined as one of the project's core goals during the workshop. Achieving that goal included educating the community about the value of nature in our urban environments. Becoming aware of this educational aspect helped us recognize that there were many educational actors in the sector that were not being included in the definition of the project, including a nearby school that shares some of the *humedal*'s water resources, and some existing community education projects that had not been offered representation in various project conversations, despite their existence being taken into

Figure 4
The prototype (left) offering community participants the opportunity to imagine their future perspective. © 2019 by Esteban Esquivel and Carlos Andrés Garzón, Centro de Investigación e Innovación Comunitaria.

consideration. It also reinforced the idea that any infrastructure to be built would serve as a focal point of education.

The second change in perspective was a literal one. To better perceive the positive environmental influence exerted by the *humedal*, explore possible changes to community perceptions, and better discern the network building potential of the site and project, workshop participants came up with the idea for another prototype: stage a temporary observation structure (out of scaffolding) that would provide a different view of the physical site (Figure 4).

The participants who used the prototype reported a change in their experience of the place, a better understanding of the area's physical size, and a greater sense of the possibilities it holds for the community. Based on this clarity about the value of the view of the *humedal* the workshop participants decided to invite different actors to be active participants: a neighboring mall of fresh markets that physically faces away from the site (the wall adjacent to the humedal is the back of the building where the garbage is stored). The mall had been supportive of the project, but had never seen any value in changing its point of view to face the green space. Thanks to the work done with the workshop and the new role of the view of the *humedal* as a value, a project emerged that uses this space and the view as the main attraction for an area of restaurants.

When value-mapping targets the future in a collaborative setting, the perspective it generates not only helps reframe a design process—it is a powerful reminder that the design project is an opportunity for social transformation based on the values that best represent the community. It can also introduce the notion that the designed object or infrastructure is a step leading toward the preferred future defined by the community.
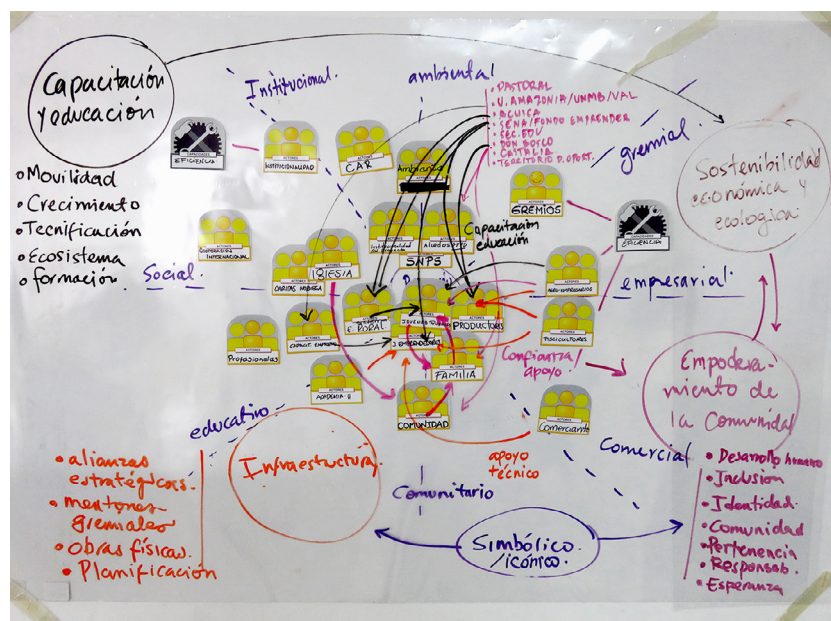
The second case we will present is a workshop held in conjunction with a fishery industry development project in the Department of Caquetá in Colombia. The project participants included rural communities, as well as social and governmental actors.

Similar to the *humedal* project, there was already a concrete proposal on the table when we joined the project—this time, it was plans to build a fish processing and commercialization plant. The proposal had already

51 De la Rosa et al., "Prototyping as a Resource," 7.

shifted the project team's focus away from the concern for local craft preservation toward a discussion of the project's real-world viability. We were initially engaged to facilitate a participatory design workshop to help project leaders draft an appropriate set of requirements to be met by the infrastructure-to-be. As mentioned in the introduction of this article, at times it is necessary to foster a critical stance toward a proposed future possibility. We decided that a critical approach was appropriate in this instance.

The first step was to diagnose whether there were voices missing from the conversation. We began by leading an analysis of the potential repercussions the plant could have within the community, and defining not only who was benefiting from the process, but also who or what might be harmed, or damaged, or otherwise suffer from potentially negative future consequences. Observing the unintended negative repercussions of what appears to be a valuable option helps people recognize that there are more limitations than a project's potential viability or feasibility, and that there can be stakeholders involved in projects that should be (but have not been) acknowledged or otherwise included in the project development process.

We applied the notion proposed by de la Rosa, Kohler and Ruecker's[51] of producing multiple layers of maps of the system literally, using transparent acetate sheets to superimpose levels of detail—possible actions, intentions, and values—onto the existing plan. Each layer of acetate was created separately, and later they were superimposed to create a single, multilayered map. This technique helped us provide the participants with complex maps of the system that could be reduced or modified depending on the conversation taking place (Figure 5).

From this exercise, we moved on to the project's future capabilities and future requirements, and to building prototypes of the future system in the form of diffuse conversational objects.

Figure 5
Image of a stakeholder, sector, and relationship map using multiple layers of analysis. We can see here the mapping with dry markers on layers of transparent acetate and then overlapped as a single map © 2019 by Juan de la Rosa.

Defining these categories helped participants consider the project from a systemic perspective. After the initial mapping, we developed several strategic actions for the near and far future of the community. Later on during the workshop, we connected these intended actions together to form a collective strategic plan of action. The activity also challenged participants' perceptions of the project's future timeline. Their tangible, goal-oriented project had a defined schedule, but now they saw a systemic transformation that would obtain through the development and realization of the object-being-designed.

Four areas of value emerged during the mapping process: *education*, *sustainability*, *infrastructure*, and *social empowerment*. From that point on, those areas served as project objectives, so we defined a series of prototypes to imagine possible future portions of the project based on each of the areas.

This process led to the complete redefinition of the project. First and foremost was the recognition that the processing plant was not the final goal of the process. It was a strategic undertaking intended to open up future possibilities for other actions that, combined, would eventuate some form of societal transformation.

We argue that there is a necessary element of *boosterism* in the practice of design, especially when working with participants — a need to induce a solution-based euphoria strong enough to inspire community engagement and real action. However, that euphoria comes at a price: the brightness of the potential may obscure the project's consequences, present or future. The use of value mapping and multilayered displaced prototypes allowed us to extend stakeholders' perceptions of time, define possible future collaborations among them, and in a wider sense, clarify the "bigger picture" of that joint future.

We have also seen that participation promotes the notion of common good and fosters a resonance among community members that amplifies their desire for a transformed future. Mapping values, in turn, helps shape the project around a more conscious definition of the future.

Discussion

Our work with public bodies revealed several systemic issues associated with democratic action and policymaking. First, the democratic value of participation has been reduced to forming an opinion about courses of action previously determined by those in power, and the democratic quest for alternate futures has been reduced to demagoguery and superficial politics. Future policies are connected to governments and their intentions, and hence may not reflect various communities' needs and aspirations. This approach to participation is a variation of top-down governance, with a democratic flavor.

We have also seen that when policies are produced from the top down, they tend to be universal, and so do not necessarily represent the sociocultural complexities of local places. A top-down approach not only misses the public mark, it also makes policies reactive to problematics rather than adaptive, eliminating the flexibility that communities need in order to face

constant change, and restricting their agency to confines of the government's short-term vision.

So, how do we move from a top-down model of democracy, where the government holds the power in the decision making process, and the public is only entitled to express an opinion or vote between polarized views informed by various political agendas? There is no simple answer to this question, but based on our observations we propose a series of possibilities that might open a conversation about a future where we redesign democracy.

We argue that the use of research practices like the ones presented in this paper can help define flexible, evolving policymaking practices. The potential framework should deploy systemic and participatory methods, especially active mapping to envision systems of values and consequences. The model should help users define ideas and intentions for their future based on values defined by the community, and provide decision makers with sufficient informational granularity and complexity. When people envision infrastructural futures collaboratively, they project the values of the community into the policymaking sphere, broadcasting a clear message of what future the policies should facilitate (Figure 6).

Scaling this process through ongoing community engagement could potentially create a rich bank of information and reveal macro trends in a community's perception of their future (Figure 7). We believe that this process can integrate bottom-up and top-down models of governance through a layered flux of information and decision making that enables experimental models of community-based governance to emerge (Figure 8).

Figure 6
Applying a community-based participatory process can project real community intentions into policymaking. © 2019 by Juan de la Rosa.
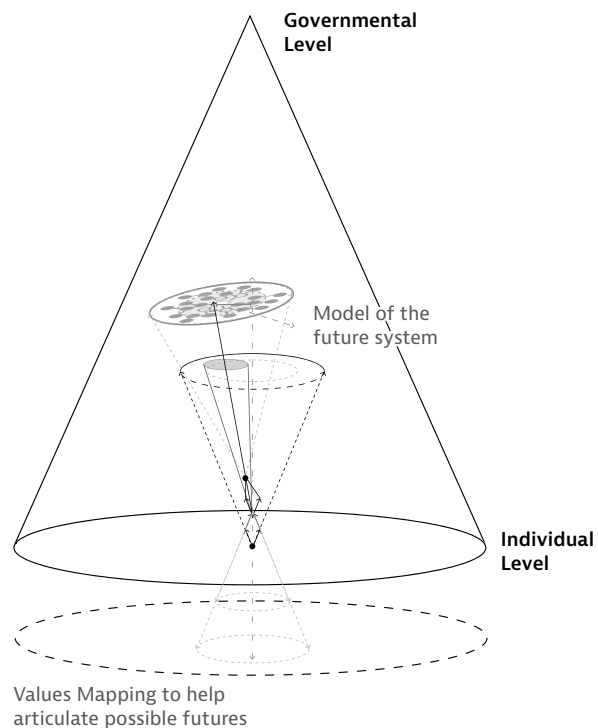

Governmental Level

Model of the future system

Individual Level

Values Mapping to help articulate possible futures

Figure 7
Possible emergence of macro trends out of the repetition of design-led community workshops. © 2019 by Juan de la Rosa.
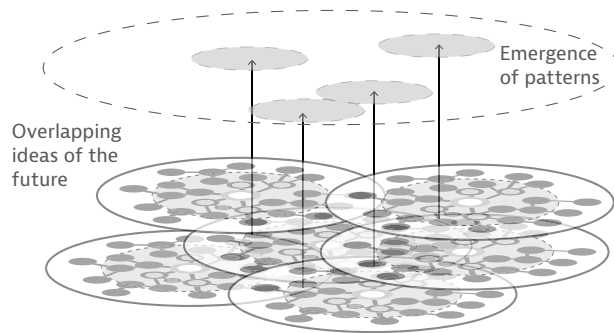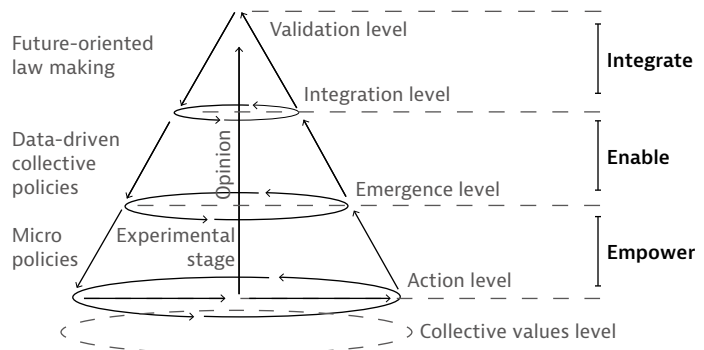

Figure 8
A possible model of policymaking information levels. © 2019 by Juan de la Rosa.

52 Peter H. Jones, "Embedded Values in Process and Practice: Interactions between Disciplinary Practices and Formal Innovation Processes," *Design Management Journal* 2, no. 1 (2002): 21, DOI: https://doi.org/10.1111/j.1948-7177.2002.tb00009.x; Nelson and Stolterman, *Design Way*, 12.

Conclusions

This article does not seek to produce or validate conclusions about the models we employed. Rather, it seeks to open up an opportunity for reflection on the role that designers might play in the redistribution of democratic powers and the definition of more flexible policies that can really adapt to a changing reality. We argue that it is necessary to seek different systemic models for the design process, some that could provide tools for the definition of complex views of the future that include the side effects and unintended consequences of the plans we devise[52] not only for the group in control but also for other communities and silent stakeholders. We also believe that the construction of more systemic views of the future can lead to a better process of scaling up into central policy makers and to the top-down implementation of holistic policies that include bottom-up definitions.

Collective discursive prototypes can contribute to the design of future scenarios and to a possible redefinition of democratic participation. They could be implemented as part of a collective, community-based drive to constantly foreground concerns that emerge from the bottom up. The method challenges assumptions and manipulated perspectives, and prevents their becoming reified by the groups in control. Finally, a design-led democratic process could flatten the pyramid of power, making communities the decision makers, and turning community members who *can* lead into the future into the politicians of the future (Figure 9).
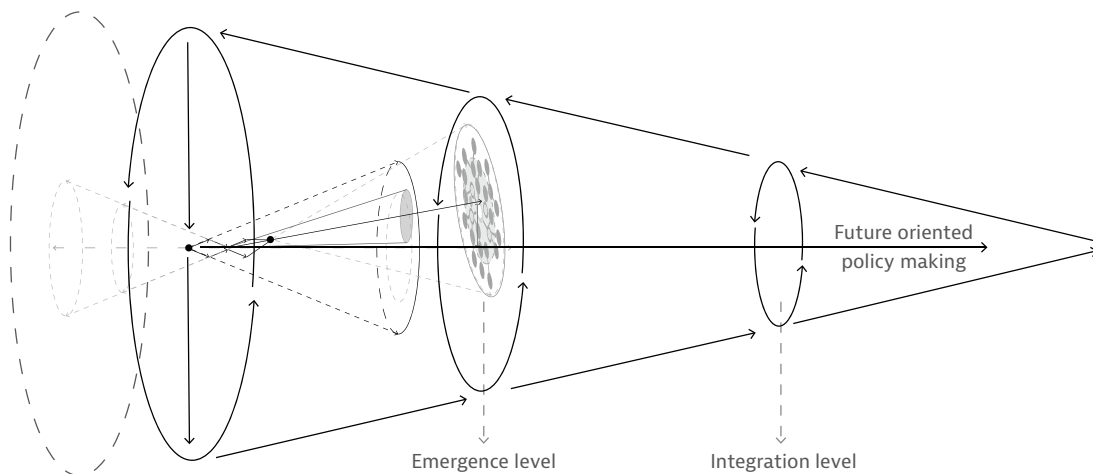
Figure 9
A possible horizontal model that moves from values to policymaking. © 2019 by Juan de la Rosa.

The model that we have created and adapted for these projects is not the only possible model to use, but it does meet several criteria that are important when bringing top-down and bottom-up policy efforts together. First, it serves as the basis for the community definition of multiple prototypes or future narratives, extending the vision of the possible beyond what is often one or two top-down visions of the future. Second, through providing prototypes or scenarios as conversational objects, it allows communities to identify other, previously silent stakeholders. Third, it facilitates discussion about the community's real-world values—be they current or aspirational—grounded in the values that the various prototypes or narratives represent. Fourth, it provides tangible objects of discussion that can be shared among people who represent the top-down and bottom-up perspectives.

Declaration of Interests

There are no conflicts of interest involved in this article.

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