

Design for an Unknown Future: Amplified Roles for Collaboration, New Design Knowledge, and Creativity

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Introduction

The field of design has expanded significantly in recent years. In addition to engaging in the design of artifacts, designers are applying their skills in a wide range of areas that include organizational design, service design, strategic design, interaction design, and design for social innovation. The rapid development of these areas is, in part, propelled by a broad recognition of design thinking and practice as a significant driver of innovation. This recognition is reflected in the establishment of government-funded design labs, such as MindLab in Denmark and Helsinki Design Lab in Finland. The potential of design to transform the public sector has also recently been recognized in Australia through the development of the Centre for Excellence in Public Service Design.

Although recent research has identified new and emerging roles for design and the designer in the twenty-first century, a number of areas remain underexplored in the literature. This article examines several of these areas, including the designer's role as co-creator in collaborative and interdisciplinary teams, as well as the designer's role in generating new design knowledge and in developing and contributing to cultures of creativity. Examples from practice are used to illuminate the growing importance of these roles in design and for designers as they navigate the complexity of today's design challenges.

Design for an Unknown Future

Educational theorist Ronald Barnett explores the notion of what it means to learn for an unknown future.¹ He describes the context through the notion of supercomplexity. His ideas provide a constructive lens through which to examine the future of design. Barnett notes that of course the future has always been unknown, but that the sense of the unknown has never been as vivid as it is now. A supercomplex world is characterized by uncertainty, unpredictability, contestability, and changeability, and its complexity arises from a multiplicity of frameworks.² In the case of education, this situation challenges the notion of well-defined discipline

1 Ronald Barnett, "Learning for an Unknown Future," *Higher Education Research and Development* 31, no. 1 (2012): 65–77.

2 Ronald Barnett, "University Knowledge in an Age of Supercomplexity," *Higher Education* 40 (2000): 409–422.

structures. What does the supercomplex world, with its multiplicity of frameworks, mean for design? How are the platforms, approaches, and processes of design shifting to meet the needs of this changing world?

The Global Agenda Council for Design Innovation recognizes that the complex environment in which we live requires that we “constantly readjust our mindsets to tackle its dynamic forces” and describes design and innovation as drivers for a creative and sustainable future.³ To address future global challenges, the Council asserts, design and innovation need to “act as systems of collaboration that encourage inclusive, accessible, multifunctional, and sustainable ways of thinking.”⁴ Similarly, in their RED Paper 02, Colin Burns et al. make clear that new problems require new practice, and they highlight the need for greater interaction with the community and users and new ways of tapping into the creativity of these groups.⁵

Design and innovation have been described as naturally democratic mediums. That is, they are able to preserve their cultural principles while embracing new ideas and systems.⁶ In this sense, design seems well positioned to make significant contributions in a world where discipline boundaries are blurred and new frameworks are called for.

Design Thinking to Transformational Design: Toward a Renegotiation of Boundaries

Tim Brown, CEO and President of the leading design firm IDEO, has contributed to the popularization of design thinking.⁷ The early application of design thinking by Brown and his contemporaries was largely focused on the business sector. It has been used to give businesses a competitive edge and to provide managers with alternative tools for undertaking significant organizational change. In Brown’s words, design thinking “uses the designer’s sensibility and methods to match people’s needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity.”⁸ Brown has described the process as a system of three overlapping spaces: inspiration, ideation, and implementation, and he defines the key features of design thinking as empathy, integrative thinking, optimism, experimentalism, and collaboration.⁹ Brown notes that the more linear nature of business approaches and activities is what distinguishes them from design thinking.

In critical discussions about design thinking, Lucy Kimbell calls for an acknowledgement of “the situated, embodied work of design thinking practice,” as well as for recognition of “the diversity of designers’ practices and the institutions in which they work.”¹⁰ In addition, she raises concerns about the fact that despite claims about design thinking being “user-centered,” the designer is still heralded as the main agent in and of design.¹¹

3 “Global Agenda Council on Design & Innovation 2013,” World Economic Forum, www.weforum.org/content/global-agenda-council-design-innovation-2012-2013 (accessed May 28, 2013).

4 Ibid.

5 Colin Burns et al., “Red Paper 02: Transformation Design,” British Design Council (2006): 8. See www.designcouncil.info/mt/RED/transformationdesign/TransformationDesignFinalDraft.pdf (accessed May 20, 2013).

6 See Leon Cruikshank, “The Innovation Dimension: Designing in a Broader Context,” *Design Issues* 26, no. 2 (2010): 17–26; and Global Agenda Council.

7 See Tim Brown, “Design Thinking,” *Harvard Business Review* (June 2008): 84–92; Tim Brown, *Change By Design: How Design Thinking Transforms Organizations and Inspires Innovation* (New York: HarperCollins, 2009); and Tim Brown and Jocelyn Wyatt, “Design Thinking for Social Innovation,” *Stanford Social Innovation Review*, Stanford Graduate School of Business (Winter 2010), www.ssireview.org/articles/entry/design_thinking_for_social_innovation/ (accessed May 28, 2013).

8 Brown, “Design Thinking,” 86.

9 Ibid., 87–88.

10 Lucy Kimbell, “Rethinking Design Thinking: Part I,” *Design and Culture* 3, no. 3 (2011): 289.

11 Ibid.

Kimbell's efforts to reinstate "practice" in conversations about design thinking are supported by Tony Fry, who highlights the inseparable connection between design practice and what designers do. He describes practice as that which "forms and animates [designers'] ontology as designers."¹² The distinction between process and practice as a way of understanding the contribution of design is further explored by Robert Young, who emphasizes design as a way of being and doing, rather than as an object of enquiry. Young highlights the ability of design to embrace opportunity through creativity, to observe patterns and to connect problems with solutions.¹³

The release of RED Paper 02 in 2006, by the RED group of the British Design Council,¹⁴ signifies an important shift in ideas about design thinking. The paper articulates a broader conception of design thinking and captures new directions in design under the banner of transformation design. (The paper has been credited as one of the first to link design and social innovation.) The paper recognizes the potential of harnessing "the creativity of users and front line workers to co-create new public services that better address... complex problems."¹⁵ The RED group has applied transformation design to a broad range of contexts, including the prevention of ill health, the management of chronic illness, reducing energy use, strengthening citizenship, reducing recidivism among prisoners, and improving learning.¹⁶ The practice is described as interdisciplinary, and the term "design innovation" is used to describe RED's approach to challenging the accepted thinking in business and the public sector. Transformation design is described as "building on traditional design skills," and using "the design process as a means to enable a wide range of disciplines and stakeholders to collaborate."¹⁷ The paper acknowledges that the desire is growing among designers to tackle society's challenging problems, and those challenges are described as complex, non-linear problems that are connected to other problems and produce unintended consequences.¹⁸ Once again, we are reminded of the features of super-complexity identified by Barnett: unpredictability, changeability, uncertainty, and contestability.¹⁹ These conditions challenge the effectiveness of hierarchical structures, which are less suited to handling complex problems.

The term transformation design suggests a growing need to focus on the reinvention of industries and institutions—that is, on fundamental rather than incremental change. Echoing Richard Buchanan,²⁰ the RED paper suggests that transformation design is a transferrable process "that can be applied to almost any problem."²¹ The notion of adaptation is also highlighted, and a key feature of transformation design is its ability to "adapt to changing circumstances."²² The paper suggests that new areas of design tend to take a more holistic approach that involves "the orchestration of a range of different design inputs."²³ Importantly, the paper also points to

12 Tony Fry, *Design Futuring: Sustainability, Ethics and New Practice* (Oxford, UK: Berg, 2008): 22.

13 Robert Young, interview, *Design Transitions* (February 2012), <http://design-transitions.com/expert-view/bob-young/> (accessed June 5, 2013).

14 Burns et al., "Red Paper 02," 8.

15 *Ibid.*, 2.

16 *Ibid.*

17 *Ibid.*, 6.

18 *Ibid.*, 8.

19 Barnett, "University Knowledge," 415.

20 Richard Buchanan, "Wicked Problems in Design Thinking," *Design Issues* 8, no. 2 (1992): 5–12.

21 Burns et al., "Red Paper 02," 9.

22 *Ibid.*

23 *Ibid.*, 11.

the need for products, services, experiences, and interactions that are “desirable, aspirational, compelling and delightful.”²⁴ Overall, transformation design could be seen as a more nuanced approach to societal change than earlier iterations of design thinking.

As design thinking moves into different arenas, new insights can be gained and shared across the sector. The concept of design thinking is gradually being expanded and reframed through contact with a broad range of professional disciplines; earlier ties that kept it tethered to industrial and product design are being loosened. This shift might be seen as representing a renegotiation of boundaries—and as boundaries shift and the field expands, opportunities abound for sharing different ways of thinking about design thinking and practice.

Foregrounding Values: New Shapes and Structures for Practice

The widespread foregrounding of values evident across the design industry could be seen as driving significant changes in the shapes and structures in which designers represent themselves in the professional arena. An understanding of these new contexts—their shapes and structures—is central to an understanding of how designers are beginning to work. A review of a broad range of design practices, conducted for the purpose of this study, illustrates clear links between the values articulated by design firms and the types of projects and processes with which they engage. Evidence suggests that the design industry is becoming increasingly aware of the positive and meaningful effect it can have on the environment, culture, the economy, and society. As acknowledged in a body of research conducted by Imagination Lancaster, the view of the designer as the wellspring of innovation is rapidly receding and, in many areas of the expanded field, is being replaced by the idea of the designer as contributor to highly collaborative and interdisciplinary teams.²⁵ The review of design firms and “design labs” carried out as part of this research reveals a number of dominant structural and organizational models. A predominant model consists of an interdisciplinary team (led by designers) working with experts across different fields (determined by the project) along with users and front-end workers.

A number of examples from practice demonstrate links between values, processes, and projects. The directors of Digital Eskimo describe their practice as one of Australia’s first value-driven agencies. Their “considered design” approach is defined as a collaborative, human-centered approach that involves working closely with clients and communities to “co-create designs that are appropriate, effective, and adaptable to change.”²⁶ The approach involves extending the design method to create conditions for participation: “seeding content, connections, and communities is now

24 Ibid., 9.

25 ImaginationLancaster, “Democratising Innovation,” http://imagination.lancaster.ac.uk/themes/Democratising_Innovation (accessed May 28, 2013).

26 “Digital Eskimo (Approach),” <http://digitaleskimo.net/> (accessed May 28, 2013).

central to our evolving role as designers of technology, as facilitators of experience, and creators of conditions for growth, participation, and emergent design.”²⁷ The architecture firm MVRDV focuses on creating buildings, urban plans, studies, and objects that enable cities and landscapes to “develop towards a better future.”²⁸ The firm’s focus on “vertical suburbias” is aligned to a world in which the population is expected to rise in the next 20 years to eight billion, with five billion people living in urban environments.²⁹

Design projects showcased on the Design for Social Innovation and Sustainability (DESIS) website illuminate the importance of the values underpinning design for social innovation and the emergence of new ways of working. For example, the role of design in the Nishiwaki Project was to “promote new activities and to revitalize the local [textiles] industry through the interaction of creators, entrepreneurs, and neighbours, utilizing cultural heritage in the area.”³⁰ HeHe in Paris is recognized by Paul Rodgers as a practice whose principals have values that are driving new ways of working: “[T]he network of people that they work with is incredible – laser engineers from Finland for a project that is based in an incinerator plant in Paris.... [T]his clearly illustrates the power of the network, facilitated by the Internet and social media.”³¹ The interconnectedness of values, emerging structures, and processes can be seen in the work of many other leading designers and design firms, including ARUP, Mazzanti Arquitectos, Wang Shu, and Live | Work.

The foregrounding of values and their clear articulation, evident across the field, likely reflect the emergence of designers for whom Fry calls: “designers who lead rather than follow,” and those who are able to *initiate* projects, not just provide a service.³² Both Fry and Ezio Manzini highlight the opportunity that designers have to be “redirective practitioners” who can create significant change that contributes to the establishment of a viable future.³³ Tools such as Carolyn Strauss and Alastair Fuad-Luke’s “Slow Design Principles” contribute to the level of attention being given to the articulation of values in the design industry. Slow design (i.e., design practices that slow human, economic and resource use “metabolisms”) is described as a “unique and vital form of creative activism that is delivering new values for design and contributing to the shift towards sustainability.”³⁴

As suggested, the principles underpinning the activities of design firms can be seen as driving the development of new ways of practicing design. In particular, the design sector is seeing an important shift in the development of new networks to support practice. For example, Robin Murray, Julie Caulier-Grice, and Geoff Mulgan describe the emergence of different kinds of networks to support social innovation, including: innovation networks (e.g.,

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- 27 Penny Hagen and John MacFarlane, “Reflections on the Role of Seeding in Social Design,” in *Proceedings of the 20th Australasian Conference on Computer-Human Interaction: Designing for Habitus and Habitat* (Cairns, Australia: ACM, 2008), 4.
- 28 “MVRDV (Design Statement),” www.mrvd.nl/#/office/designstatement (accessed May 28, 2013).
- 29 Zachary Wilson, “#44 MVRDV,” *Fast Company* (July 2012); www.fastcompany.com/mic/2010/profile/mrvd (accessed May 20, 2013).
- 30 “DESIS Showcase Helsinki 2012: Nishiwaki Project,” www.slideshare.net/DESIS_Showcase/nk-kdu (accessed May 28, 2013).
- 31 Paul Rodgers, interview, *Design Transitions* (January 2012), <http://design-transitions.com/expert-view/paulrodger/> (accessed May 28, 2013).
- 32 Tony Fry, “A Decade of Design Education,” *Australian Design Review* (April 2011), www.australiandesignreview.com/opinion/2085-a-decade-of-design-education (accessed June 20, 2013).
- 33 Ezio Manzini, “Viewpoint: New Design Knowledge,” *Design Studies* 30 (2009): 4–12.
- 34 Carolyn F. Strauss and Alastair Fuad-Luke, “The Slow Design Principles: A New Interrogative and Reflexive Tool for Design Research and Practice,” *Changing the Change: Design Visions Proposals and Tools* (2008): 1, www.slowlab.net/CtC_SlowDesignPrinciples.pdf (accessed June 23, 2013).

SIX), pollination networks (e.g., Doors of Perception), collaborative networks, service collaborations, communities of practice, action learning sets, and membership organizations.³⁵ DESIS represents another example of this shift in working toward becoming a “distributed design research agency for social innovation and sustainability”—that is, a mesh of initiatives facilitated by a platform but based on the ideas and energy of individual “labs” and on their capability and willingness to collaborate.³⁶ DESIS is acutely aware that new problems require new structures and is actively working toward creating its new “distributed” model. All of these networks are focused on sharing and harnessing knowledge across different disciplinary fields and geographic locations, bringing together combinations of researchers, practitioners, and educators. Other models to support multi-organizational partnerships are also being developed, such as the “constellation collaboration” model, which is “a tool to help us recognise and become conscious designers in a complex ecosystem of organizational collaboration.”³⁷ John Hagel and John Seely Brown demonstrate the increasing relevance of “pull” models to the design industry in terms of the way designers are beginning to work. Unlike “push” models, which are “designed to ‘push’ resources in advance to areas of highest anticipated need,” pull models “create platforms that help people to mobilise appropriate resources when the need arises.”³⁸ Pull models are more adept at dealing with uncertainty, recognize people as “networked creators,” and help people to learn and innovate by pursuing pathways of learning that are tailored to their specific needs.

Research investigating new design firm models has described and advocated the idea of design firms becoming “living companies.” Living companies are nested within a structure that “connects outwardly to larger living systems (community, nation, society) and inwardly to smaller business units.”³⁹ Phillip Bernstein suggests, “in order to survive, the design industry must take stock of alternative business models, look at how they fit into their client’s business ecosystems, and have a clear understanding of what value they bring to the design process.”⁴⁰

Amplified Roles for Collaboration, New Design Knowledge, and Creative Cultures

Along with the foregrounding of values, new and emerging roles for designers have been studied, particularly by Tom Inns, and these roles provide insight into the contribution of design practice in current and future contexts. In connection with the *Designing for the 21st Century Research Initiative*, Inns identifies six emerging roles for designers, including facilitator of thinking, mediator between stakeholders, coordinator of exploration, visualizer of intangibles, navigator of complexity, and negotiator of value.⁴¹ We conducted a broader review of the literature on the expanding parameters of design to look for additional roles not captured in

35 Robin Murray, Julie Caulier-Grice, and Geoff Mulgan, *The Open Book of Social Innovation*. Social Innovator Series: Ways to Design, Develop and Grow Social Innovation (London: NESTA and The Young Foundation, 2010): 136, www.nesta.org.uk/library/documents/Social_Innovator_020310.pdf (accessed May 28, 2013).

36 Ezio Manzini, “A Distributed Design Agency: A Work in Progress,” DESIS Network: Design for Social Innovation and Sustainability, www.desis-network.org/content/distributed-design-agency-work-progress (accessed May 17, 2013).

37 Tonya Surman, “Constellation Collaboration: A Model for Multi-Organizational Partnership,” Centre for Social Innovation (2006): 1, <http://s.socialinnovation.ca/files/Constellation%20Model%20Description%20June%2009%2706.pdf> (accessed May 20, 2013).

38 John Hagel and John Seely Brown, “From Push to Pull: Emerging Models for Mobilising Resources,” *Journal of Service Science* 1, no. 1 (2008): 93–110.

39 Phillip Bernstein, “Discovering New Design Firm Models,” *Design Intelligence*, www.di.net/articles/discovering-new-design-firm-models-1/ (accessed June 2, 2013).

40 Ibid.

41 Tom Inns, ed., Introduction. *Designing for the 21st Century*, vol. 2, Interdisciplinary Methods and Findings, (Surrey: Ashgate, 2010), www.ashgate.com/pdf/samplepages/designing_for_the_21st_century_intro.pdf (accessed May 20, 2013).

Inns's framework, and to highlight roles that appear to be underexplored or less well understood in the literature. In addition to the scholarly literature, the review included a broad range of design firms engaged in expanded areas of design, from practices identified as leading international firms (by networks such as FastCo) to smaller, local firms.

Our review identified a number of roles to add to the roles identified by Inns, including the designer as capacity builder, strategist, design lead/interpolator, and driver and translator of innovation. However, we specifically address here three roles that appear to be underexplored in the literature:

- Co-creator: contributor to collaborative and interdisciplinary teams;
- Generator of new design knowledge; and
- Developer of, and contributor to, creative cultures.

Co-Creator: Contributor to Collaborative and Interdisciplinary Teams

The review suggests that the designer's role as co-creator, as contributor to collaborative and interdisciplinary teams, is becoming increasingly important. Designers' involvement in collaborative processes can be seen as going beyond established participatory design processes. In the book *Massive Change*, Bruce Mau and Jennifer Leonard describe the future of global design as fundamentally collaborative.⁴² In this case, then, designers and design firms must play an active role in developing tools and cultures to support collaboration. With regard to design in public and social innovation, Mulgan suggests that designers "need to recognise that they are most likely to achieve their best within teams bringing together complementary skills."⁴³ In describing emerging roles for design, Young views design as an "inter-discipline" in terms of its ability to mediate opportunities and to interpret meaning and increase capacity across disciplines.⁴⁴

Elizabeth Standers and Pieter Jan Stappers make a distinction between the concepts of "co-creation" and "co-design." In their words, co-creation refers to "any act of collective creativity."⁴⁵ By contrast, co-design has a narrower definition and refers to "collective creativity as it is applied across the whole span of a design process."⁴⁶ Fuad-Luke describes collaboration in relation to co-design as "collective intelligence" (which mirrors recent attention given to the term "creative intelligence" by Bruce Nussbaum).⁴⁷ Although some researchers view co-design as the creative activity practiced by collaborating designers, Standers and Stappers view it more broadly as "the creativity of designers and people not trained in design working together in the design development process."⁴⁸ They point out that the user-centered design approach proved to be advantageous in the design and development of consumer products but that "we are no longer simply designing products for users. We are designing for the future experiences of

42 Bruce Mau, Jennifer Leonard, and The Institute Without Boundaries, *Massive Change* (London: Phaidon, 2004).

43 Geoff Mulgan, "Design in Public and Social Innovation – What Works, and What Could Work Better," (London: NESTA, 2008), 2, www.nesta.org.uk/library/documents/GMDesign-WhatWorksWhatCouldWorkBetter.pdf (accessed May 4, 2013).

44 Young, interview, <http://design-transitions.com/expert-view/bob-young/>

45 Elizabeth B.-N. Standers and Pieter Jan Stappers, "Co-Creation and the New Landscapes of Design," *CoDesign: International Journal of CoCreation in Design and the Arts* 4, no. 1 (2008): 2.

46 Ibid., 16.

47 Alister Fuad-Luke, "Fuad-Luke: Co-Design Services for Sustainability Transition," (March 2009), www.fuad-luke.com/ (accessed May 2, 2013); Bruce Nussbaum, *Creative Intelligence* (New York: HarperCollins, 2013).

48 Standers and Stappers, "Co-Creation," 2.

people, communities, and cultures who now are connected and informed in ways that were unimaginable even 10 years ago.”⁴⁹ Standers and Stappers suggest that bringing co-creation into design practice can “change how we design, what we design, and who designs,” as well as “the tools and methods that the new teams of co-designers will use.”⁵⁰ They project that co-design teams will become more diverse and involve close collaboration between all stakeholders, along with professionals who have a combination of design and research skills.⁵¹

Some practices are developing completely new forms of collaboration to support design practice. For example, Idiom Design, a design and innovation consultancy in Bangalore, describes itself as an incubator of ideas for business, and the firm’s designers recently developed a new model of collaboration and consultancy called *Dream:In*. Students were trained to interview thousands of people about their aspirations. The information was categorized and presented to business people, consultants, and design researchers who helped draw up business plans to enable those aspirations. The plans form part of a portfolio that venture capitalists can draw from to devise transformative and inclusive products and services. Additional interviews are conducted each year, and the portfolio of business plans is replenished.

Superflux is an Anglo-Indian design practice located in London and Ahmedabad. The directors explain that they “work closely with clients and collaborators on projects that acknowledge the reality of our rapidly changing times, designing with and for uncertainty, instead of resisting it.”⁵² They describe the designer as “someone who is involved with collaborators and the wider community to design new kinds of models of living for the twenty-first century, a designer who is in effect helping widen perspectives.” Heatherwick Studio is an example of an architecture firm that has recently expanded in new directions and that actively fosters interdisciplinarity and collaboration. It is recognized for its work in architecture, urban infrastructure, sculpture, design, and strategic thinking. Frog Design is a global innovation firm focusing on the creation of products, services, and experiences. All Frog Design’s projects are informed by an interdisciplinary approach. CoDesign Studio in Australia involves a large network of qualified professionals who contribute to projects, and their expertise is in areas such as design, planning, industrial design, interior design, environmental management, engineering, economics, and social sciences.

In addition to design firms collaborating with non-designers, design projects also commonly involve collaborations across design practices, and firms make use of associates rather than staff to bring the right combination of skills to a project (see Superflux as an example). Similarly, an increasing number of designers prefer to work independently and to work with more than one “studio.”⁵³

49 Ibid., 6.

50 Ibid., 12.

51 Ibid., 13.

52 Anab Jain and Jon Arden, “Superflux: Moving to New Ways of Collaborating,” *DesignTransitions* (April 3, 2012), <http://design-transitions.com/2012/04/superflux/> (accessed May 6, 2013).

53 Ibid.

Practices such as User Studio in France recognize that design teams increasingly “seem to be composed of small agencies and freelance designers, social scientists, developers, and business consultants teaming up on a regular basis. It seems this trend will develop as designers work with an increasingly diverse range of industries, which in turn require diverse skill sets and expertise.”⁵⁴ The design firm Questo | N6 believes in multidisciplinary design with no boundaries: “We understand design is a real transforming force when developed in a holistic, integral way. Positive impact through design is obtained by the orchestration of all contact points.”⁵⁵

Other examples of design firms’ use of highly collaborative and interdisciplinary processes include: UsCreates, which uses an interdisciplinary co-creation process; TACSI, which works with others in social science, business, and community development in a co-design process; and Design Against Crime Research Centre, a practice that views the designer as the facilitator of a “co-design” process, making it possible for those outside the design disciplines to contribute to the process of design, and enabling a process of “open” research innovation. Additional examples of design firms and groups fostering interdisciplinary and collaborative approaches include SsD, ARUP, Ziba, and DESIS.⁵⁶

Brown and Wyatt suggest that to operate in the interdisciplinary environment, “an individual needs to have strength in two dimensions—every member needs to possess a depth of skills that allows for tangible contributions; and also empathy for people and for disciplines beyond one’s own (expressed as openness, curiosity, optimism, a tendency toward learning through doing, and experimentation).”⁵⁷ Mulgan lists a number of criticisms of designers operating in the public and social innovation sphere, one of which is that “they are eloquent on why other fields and disciplines need them but not so good at recognizing what they might need to learn from others.”⁵⁸ Further, he proposes that some designers need to combine their skills in design with other key skills, such as economics, policy, and social knowledge.⁵⁹

Alastair Parvin has recently highlighted a trend towards the democratization of production and its effect on the design field.⁶⁰ He points out that architecture currently caters to approximately one percent of the world’s population and describes a very different future for architecture that involves a key role for citizens in the designing and building of their own built environments, aided by the increasing accessibility of manufacturing tools, such as 3D printers. This trend sees the professional designer and citizens entering into a new kind of collaborative relationship—one in which the design team is “everyone.”

Understanding emerging contexts and collaborative settings for design is crucial in understanding how to maximize the designer’s contribution to interdisciplinary problem-setting

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- 54 Matthew Marino, “User Studio: Pioneering Service Design in France,” *Design Transitions* (September 10, 2012), <http://design-transitions.com/2012/09/user-studio-pioneering-service-design-in-france/> (accessed May 10, 2013).
- 55 Leo Massarelli, “Questo | N6: Designers as Conductors,” *Design Transitions* (April 2012), <http://design-transitions.com/2012/04/questto/> (accessed May 10, 2013).
- 56 Us Creates: <http://uscreates.com/>; TACSI: www.tacsi.org.au/; Design Against Crime Research Centre: www.designagainstcrime.com/; SsD: www.ssdarchitecture.com/; ARUP: www.arup.com/; Ziba: www.ziba.com/; DESIS: www.desis-network.org/
- 57 Brown and Wyatt, “Design Thinking for Social Innovation.” www.ssireview.org/articles/entry/design_thinking_for_social_innovation/
- 58 Mulgan, “Design in Public and Social Innovation,” 6.
- 59 *Ibid.*, 7.
- 60 Alastair Parvin, “Architecture for the People by the People,” TED Talk (February 2013), www.ted.com/talks/alastair_parvin_architecture_for_the_people_by_the_people.html (accessed June 10, 2013).

and -solving. Given that the work of the designer is becoming increasingly collaborative, an understanding of the intersections between design and other fields (e.g., business, marketing, social sciences, and technology) is a productive area for research. Christian Aminoff et al. examine these intersections and provide a useful tool for considering the qualities that the designer brings to these overlapping areas and, importantly, the effect that these expanding areas of intersection have on design education.⁶¹

Generator of New Design Knowledge

In addition to showing the emphasis on collaboration and interdisciplinarity, our review of literature and practice also suggests an increasing emphasis on the importance of developing new design knowledge and on articulating new design methods, processes, and outputs. Design processes associated with the expanding field of design have been captured in publications like *The Open Book of Social Innovation*.⁶² In this volume, the authors capture the hundreds of methods and tools for innovation being used in different sectors across the world to provide a knowledge base for social innovation. The book demonstrates that new design knowledge and processes are emerging in response to new challenges. The design industry is recognizing that complex design problems require a strong focus on research and the creation of new knowledge.

In a discussion of the contribution of practice, Young suggests that “designers have this capacity to look at other sources of knowledge and practice and identify creative opportunities and begin to structure them into new approaches.”⁶³ According to Young, designers have the ability to “zoom in and out with fluidity, the ability to represent project opportunities at various levels of detail, the capacity to understand and represent patterns, opportunities and problems.... [D]esigners have no fear in trying things out, to ask naive but insightful questions and have the confidence to get things done.”⁶⁴ He argues that designers are increasingly able to work between disciplines to engage with “possibilities of the new,” and this agility has renewed the capacity of design practice to have great socio-cultural effects—offering new opportunities, wider networks, and greater relevance for practice.⁶⁵

We identified many examples of design practices and networks that are actively investigating and developing new design knowledge. ASIX develops and tests new approaches and methods for social innovation; ImaginationLancaster uses innovation strategies that combine practice-based methods arising from design and the arts with science and social science methods; and MVRVD, in collaboration with Delft University of Technology, has established The Why Factory, which “concentrates on the production of models and visualisations for future cities.”⁶⁶ The design firm Artefact is

61 Christian Aminoff et al., *The Changed Role of Design* (Helsinki: Ministry of Employment and the Economy, 2010), www.tem.fi/files/26881/The_Changed_Role_of_Design.pdf (accessed April 3, 2013).

62 Murray, Caulier-Grice, and Mulgan, “The Open Book,” 2–3.

63 Young, interview, <http://design-transitions.com/expert-view/bob-young/>.

64 Ibid.

65 Ibid.

66 TU Delft, “The Why Factory,” TU Delft University and MVRDV, www.bk.tudelft.nl/?id=15370&L=1 (accessed May 10, 2013).

investigating a process to help designers stay focused on empathy, with the aim of making it a tangible part of the design process. Another design practice, Morphogenesis, recognizes that excellence in design relies on “a continuous process of design appraisal [and that] collaboratively and objectively done, this provides the opportunity to question and invent new paradigms and schema in design.”⁶⁷

ImaginationLancaster recognizes the importance of developing new design processes that can contribute to the development of broader innovation processes. They argue for “the facilitation of more dynamic and effective innovation processes using new technology, new educational strategies, the application of design thinking, and the development of new design processes.”⁶⁸ Manzini also emphasizes the importance of building new design knowledge through design practice “that is able to help individuals, communities, institutions, and companies to design feasible, sustainable solutions in the social and operational framework of a network society and a knowledge society.”⁶⁹ In a paper summarizing the strengths and weaknesses of design in relation to public and social innovation, Mulgan states that, in addition to more skilled people, “we need better methods – that use design within project frameworks that improve their prospects for implementation.”⁷⁰ Increasingly, designers are recognizing that many existing design methodologies are not appropriate when dealing with complex systems and products. For example, Caroline Hummels and Joep Frens propose a “reflective transformative design process that... regards design action as a generator of knowledge” for dealing with highly interactive systems and products.⁷¹ Kimbell’s perspective on the contribution of design practice has relevance here, lending support to the alignment between the practice of design, research value, and new knowledge creation.⁷²

Standers and Stappers (2008) suggest that the roles between designers and design researchers are becoming increasingly blurred, and they paint a vivid picture of the shifting landscape of design: “[I]t will eventually become evident that the design research community doesn’t need to worry about ownership of spaces on the design research landscape since we will be creating new ones. The landscape of design and research will be infinite in space and time and be continually changing.”⁷³

Developer of, and Contributor to, Creative Cultures

A further theme that emerges from the literature and examples of practice relates to the increasingly significant role of the designer in developing, using, and contributing to creative cultures. Cultures of creativity are being developed and used by designers in a number of different ways. For example, cultures of creativity are being developed to enhance creativity within design firms, to support the

67 Morphogenesis, “The Way We Work,” www.morphogenesis.org/about-us/the-way-we-work/# (accessed May 28, 2013) and Morphogenesis, “Manthan,” www.morphogenesis.org/discourse/manthan/ (accessed May 28, 2013).

68 ImaginationLancaster, “Democratising Innovation.” http://imagination.lancaster.ac.uk/themes/Democratising_Innovation.

69 Manzini, “Viewpoint,” 4.

70 Mulgan, “Design in Public and Social Innovation,” 7.

71 Caroline Hummels and Joep Frens, “Designing for the Unknown: A Design Process for the Future Generation of Highly Interactive Systems and Products,” in *Proceedings of the International Conference on Engineering and Product Design Education* (Barcelona: Universitat Politècnica de Catalunya, 2008), 6.

72 Kimbell, “Rethinking Design Thinking,” 289.

73 Standers and Stappers, “Co-Creation,” 14.

generation of design and business ideas, to support the design process and achieve more meaningful outcomes, and to tap into the creativity of consumers.

In support of its co-creation practices, Sense Worldwide uses a "Sense Network," in conjunction with its own staff, to "create interdisciplinary teams to spark ideas off each other."⁷⁴ The Sense Network is a global community of thinkers representing 55 countries and 35 languages who share their collective wisdom. Such networks are being described as crucial for design companies in the twenty-first century.⁷⁵ Morphogenesis is another firm that has established a creative platform for the exchange of ideas. The platform, "Manthan," was designed to facilitate the cross-pollination and fusion of ideas and the "emergence of a design and urbanism discourse in the contemporary Asian paradigm."⁷⁶

Fabrica represents an applied creative laboratory in which "modern artists come from all over the world to develop innovative projects and explore new directions in a myriad of avenues of communication, from design, music, and film to photography, publishing, and the Internet."⁷⁷ Participle, meanwhile, brings together "widespread community-level ideas and creative activity, and mixes it with world-leading experts in any given field" to address complex social challenges.⁷⁸ Artefact's Incubation Engine (A3) is a further example of a platform used to harness creative ideas. Rodgers believes that the core skills of designers have changed in that they "now need to get a handle on technology and learn how to develop networks. Networks are now really important to design practices to remain fluid and responsive."⁷⁹

In his research on the democratization of innovation, Leon Cruikshank (2012) recognizes the important role that design needs to play in developing creative communities of practice. Also advocating creative communities, Kate Canales of Frog Design suggests that design firms have an obligation to develop creative cultures to support the work of designers.⁸⁰ In the "Amplifying Creative Communities" research project, launched by DESIS in 2009, designers learn from creative local experts, or "creative communities," and the learning is centered on the idea that the role of the designer is increasingly one of "redesigning" the ideas and innovations emerging from these creative communities.

The prevalence of design networks (e.g., DESIS, SIX, and SIXAUS) provides evidence of the growing importance of developing collaborative and creative cultures. It suggests awareness that innovation and work focusing on complex local and global challenges requires reaching out across all boundaries and harnessing the creativity of designers, users, stakeholders, and interested individuals. Although networks such as DESIS and SIX are design-led, they invite contributions and involvement from the public—that is,

74 "The Sense Network," www.sensenetwork.com/ (accessed May 28, 2013).

75 Rodgers, interview, <http://design-transitions.com/expert-view/paulrodger/>.

76 Morphogenesis, "Manthan."

77 "Fabrica," www.fabrica.it/ (accessed May 30, 2013).

78 "Participle," www.participle.net/about/our_mission (accessed May 30, 2013).

79 Rodgers, interview, <http://design-transitions.com/expert-view/paulrodger/>.

80 Kate Canales, "Cultures of Creativity [video]," Frog Design, www.frogdesign.com/about/centers-of-passion.html (accessed May 4, 2013).

from anyone interested in applying ideas, design, and creativity to environmental, social, cultural, and economic challenges. They deliberately encourage the cross-fertilization of ideas by actively connecting regional “nodes” of practice and “horizontal” collaborations. Further investigation of how design practices are developing creative cultures to support their work provides a broad scope for future research.

Conclusions and Implications

Barnett (2000) reminds us that “knowledge is not ended [in the age of supercomplexity] but is transformed into multiple knowledges.”⁸¹ The increasingly complex field of design practice can be viewed as a landscape characterized by numerous knowledges. Barnett calls for an epistemology of uncertainty, and this perspective appears to be influencing design, with pleas for models of design and innovation that embrace and support creativity; these high levels of creativity are needed to thrive in environments characterized by multiple and often competing frameworks. New knowledge in the thinking and practice of design is being developed across many different areas, and the field will continue to benefit from a flow of knowledge among all the design-oriented areas, particularly because many of these areas seem to value the new developments in the practice of collaboration, interdisciplinarity, and creativity.

We see a recognition in the literature of the gap between new developments in the expanded field of design and the response in education.⁸² Young suggests that “design has to understand that its traditional evolved role in terms of artisan practices should no longer be the singular offering in design education.”⁸³ The themes explored in this paper—themes that highlight significant roles for collaboration, new design knowledge, and creativity—raise questions about how universities are “attempting to meet the challenges of this new holistic approach to creativity and innovation,”⁸⁴ and the extent to which emerging roles and qualities in industry reflect the student qualities that design educators are developing and assessing in their courses and programs. Shared conceptions of creativity must continue to be developed in design education and used to underpin models of creativity development and assessment in design. Recent developments in the way that creativity and interdisciplinarity are being practiced and harnessed in the design industry must form part of this conversation.

81 Barnett, “University Knowledge,” 416.

82 See e.g., Aminoff et al., “The Changed Role of Design,” 50.

83 Young, interview, <http://design-transitions.com/expert-view/bob-young/>.

84 Billy Matheson, “A Culture of Creativity: Design Education and the Creative Industries,” *Journal of Management Development* 25, no. 1 (2006): 55.

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