In a co-design process, the roles change: the person who will eventually be served through the design process is given the position of 'experts of their experience', and plays a large role in knowledge development, idea generation and concept development.
Elizabeth Sanders and Pieter Jan Stappers

CO-DESIGN AS COLLABORATIVE RESEARCH

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Theodore Zamenopoulos and Katerina Alexiou

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Contents

CONNECTED COMMUNITIES
Foundation Series

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Today we are increasingly seeing calls for universities to collaborate with communities in designing and conducting research. While such calls are to be welcomed they tend to suffer from a historical blind-spot that ignores the fact that research collaboration — partnerships, participation (call it what you will) — is a deep and powerful research tradition that dates back beyond the recent emergence of calls for 'co-produced' knowledge.

This series of reviews developed as part of the AHRC's Connected Communities Programme, sets out to make visible some of these traditions of collaborative research. In doing so, the series aims to:

— help those who are new to the field to understand the huge wealth of history and resources that they might draw upon when beginning their own research collaborations;

— help those who seek to fund and promote collaborative research to understand the philosophical and political underpinnings of different traditions; and

— support those working in these traditions to identify points of commonality and difference in their methods and philosophies as a basis for strengthening the practice of collaborative research as a whole.

Research collaboration is a deep and powerful research tradition that dates back beyond the recent emergence of calls for 'co-produced' knowledge.

The eight reviews in the series were developed to provide eight very different 'takes' on the histories of collaborative research practices in the arts, humanities and social sciences. They do not pretend to be exhaustive, but to provide a personal perspective from the authors on the traditions that they are working within. As we worked together as a group to develop these, however, a number of commonalities emerged:

1. A critique of the mission-creep of scientific knowledge practices into the social sciences and humanities, and of the claims to produce universally valid forms of knowledge from specific limited institutional, cultural and social positions.

2. A commitment to creating research practices that enable diverse experiences of life and diverse knowledge traditions to be voiced and heard.

3. A resistance to seeing research methods as simply a technocratic matter; recognising instead that choices about how, where and with whom knowledge is created presuppose particular theories of reality, of power and of knowledge.

4. A commitment to grapple with questions of power, expertise and quality and to resist the idea that 'anything goes' in collaborative research and practice. There are better and worse ways of developing participation in research practice, there are conditions and constraints that make collaboration at times unethical.

At the same time, a set of names and events recur throughout the reviews: John Dewey, Paolo Freire, Raymond Williams, Donna Haraway appear as theorists and practitioners who provide powerful philosophical resources for thinking with. Critical incidents and moments reappear across the reviews: the rise of anti-colonial movements in the 1950s and 1960s, of second wave feminism and critical race theory in the 1960s and 1970s; of disability rights movements in the 1970s and 1980s; of post-human and ecological analyses in the 1990s and 2000s. Read as a whole, these reviews demonstrate the intellectual coherence and vibrancy of these many-threaded and interwoven histories of engaged scholarship and scholarly social action.

The first of the reviews, by **Kevin Myers** and **Ian Grosvenor,** discusses the long tradition of 'history from below' as a collaborative enterprise between researchers, archivists, curators, teachers, enthusiasts, local historians, archaeologists and researchers. They discuss the emergence of the 'professional historian' alongside the rise of the nation state, and the way in which this idea was challenged and deepened by the emergence of activist histories in the mid-20th century. They investigate the precedents set by the rise of groups such as the History Workshop movement and trace their legacies through a set of case studies that explore feminist histories of Birmingham, disabled people's histories of the First World War and the critique of white histories of conflict emerging from the work of black historians and communities.

Two of the reviews explore currents within participatory and critical research traditions. Niamh Moore explores these traditions through the lens of feminist philosophies and methodologies, while Tom Wakeford and Javier Sanchez Rodriguez explore the history of participatory action research (PAR) and its ties to social movements outside the academy.

Niamh Moore's review highlights the strategic contributions made to participatory research through the traditions of feminist and indigenous methodologies. Drawing on Donna Haraway's metaphor of the cat's cradle, Moore explores the way that these different traditions have learned from each other, fed into each other and been in (productive) tensions over the years. Importantly, she makes visible the common threads of these traditions, including a concern with questions of power, matters of voice, agency and empowerment and reflexivity. She identifies examples that include: popular epidemiology and women's health; the controversies and emerging insights arising from the publication of the book 'I Rigoberta Menchú' (a collaboration between Rigoberta Menchú, a Guatemalan activist and Peace Prize winner and anthropologist Elisabeth Burgos-Debray); and the online Mukurtu platform for sharing and curating community stories.

Wakeford and Sanchez Rodriguez's review is written from the position of individuals who situate themselves as both activists and academics. From a perspective both inside and outside the academy, they make visible the traditions of participatory action research that have evolved in social movements and their interaction with academic knowledge. They explain how PAR emerged as a practice that seeks to intervene and act on the world through disrupting assumptions about who has knowledge, and by building intercultural dialogue between those whose interests have historically been marginalised and those experts and institutions in dominant positions. They discuss the contributions of Paolo Freire and Orlando Fals Borda, as well as the emergence within universities of centres for Action Research and indigenist approaches to research before exploring recent examples of PAR from the Highlander Folk School in the US, to the Cumbrian Hill Farmers post Chernobyl, to questions of Food Sovereignty in India (amongst others).

Central to many attempts to build collaborative research practices is a turn towards the arts and arts methodologies as a means of engaging with different forms of knowledge.

Central to many attempts to build collaborative research practices is a turn towards the arts and arts methodologies as a means of engaging with different forms of knowledge. Such a turn, however, can often overlook the distinctive and sustained tradition within contemporary arts of reflecting upon the question of how publics can come to participate in arts practices. Our series therefore includes two reflections on this question from different perspectives:

First, **Anne Douglas'** review offers a 'poetics of participation in contemporary arts', locating the turn to participation in contemporary arts within a wider history of 20th and 21st century arts and politics. She highlights the huge range of work by artists and arts co-operatives who are seeking to make work through participatory forms, and the deep scholarly tensions and debates that surround these practices. She explores through this rich history the debates over whether participation has become instrumentalised; whether the art/life divide should be preserved or eroded; the links between participatory aesthetics and cybernetic ethics; and the capacity for participation to challenge alienation and neoliberalism. Recognising arts practice as itself a form of research and inquiry into the world, she concludes with a set of powerful reflections on the role of the freedom to improvise and the importance of participation as a moment of care for and empathy with the other.

Second, **Steve Pool,** community artist and academic, reflects on the related but different traditions of community arts as they might relate to social science research. He considers what researchers in the social sciences might need to know and understand about artistic traditions if they desire to mobilise arts practice within the social sciences. He discusses the increasing democratisation of tools for making, the potential for them to open up artistic practice to publics as well as the importance of recognising that such practices are part of wider traditions and philosophies about the value and purpose of art. In particular, he discusses the tension between the idea of artistic autonomy – art for art's sake – and artistic democracy – the democratic creativity of all individuals. He foregrounds the way in which the community arts movement was also allied to a wider politics that moved towards cultural democracy and explores the contemporary practice of artists working in and with social science through examples such as Nicola Atkinson's 'Odd Numbers' and the Community Arts Zone's 'Being Cindy Sherman'.

More recent traditions of collaborative research characterise our final three reviews which take on, respectively, the way that design theory and practice are playing an important role in reshaping society, products and services; the emergence of new technologies to facilitate new forms of collaboration; and the increasingly urgent injunction to develop research approaches that enable collaboration with the 'more-than-human' others with whom we share the planet.

Theodore Zamenopoulos and Katerina Alexiou discuss the field of co-design and its underpinning theories and methods. They argue that Design as a process is always concerned with addressing a challenge or opportunity to create a better future reality, and explore how co-design has evolved as a process of ensuring that those with the life experiences, expertise and knowledge are actively involved in these making new tools, products and services. They observe how the participatory turn in this field has been concerned with both changing the objects of design – whether this is services or objects – *and* with the changing processes of designing itself. They highlight four major traditions and their distinctive approaches, before exploring the politics and practices of co-design through case studies of work.

Chiara Bonnachi explores how the internet is enabling new forms of collaborative knowledge production at a massive scale. She locates this discussion in the traditions of citizen science and public humanities, and examines how these have been reshaped through the development of hacker communities, open innovation and crowd-sourcing. In this process, she discusses the new exclusions and opportunities that are emerging through the development of projects that mobilise mass contribution. She examines the cases of MicroPasts and TrowelBlazers that demonstrate how these methods are being used in the humanities. In particular, she explores the ethical questions that emerge in these online collaborative spaces and the need for a values-based approach to their design.

Tehseen Noorani and Julian Brigstocke conclude the series with an exploration of the practice and philosophy of 'more-than-human research' which seeks to build collaborative research with non-human/more-than-human others. They discuss its philosophical foundations in pragmatism, ecofeminism and indigenous knowledge traditions and identify some of the theoretical and practical challenges that are raised when researchers from humanist traditions begin to explore how to 'give voice' to non-human others. In the review, they consider how researchers might expand their 'repertoires of listening' and address the ethical challenges of such research. To ground their analysis, they discuss the work of the Listening to Voices Project as well as accounts of researcher-animal partnerships and projects that draw on Mayan cosmology as a means of working with sustainable forestry in Guatemala.

This collection of reviews is far from exhaustive. There are other histories of collaborative research that are under-written here – there is much more to be said (as we discuss elsewhere) on the relationship between race and the academic production of knowledge. Each of these accounts is also personal, navigating a distinctive voiced route through the particular history they are narrating.

Despite this, at a time when politics is polarising into a binary choice between 'expert knowledge' and 'populism', these reviews show, collectively, that another way is possible. They demonstrate that sustained collaborative research partnerships between publics, community researchers, civil society, universities and artists are not only possible, but that they can and do produce knowledge, experiences and insights that are both intellectually robust and socially powerful.

Professor Keri Facer
Dr Katherine Dunleavy
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1.
INTRODUCTION: WHAT IS CO-DESIGN?

This review discusses *co-design* as a type of collaborative research. It aims to explain the meaning, core concepts and historical roots that shape the landscape of co-design and its connections to knowledge development and research.

At a most fundamental level, co-design is a practice where people collaborate or connect their knowledge, skills and resources in order to carry out a design task. Examples of co-design range from user engagement in the creation of healthcare or other public services, to community initiatives leading the design of places such as community gardens, to cross-sector collaborations (involving public, private, and civil society organisations and groups) established in order to respond to social issues such as social isolation or housing.

Co-design activity produces new knowledge as people develop and experiment with (new) ideas around a matter of concern and as they engage in negotiations around the development of these ideas. Co-design is becoming important in the face of complex social, political, environmental, educational and technological issues, where no one person has the knowledge and skills to understand and solve them, and where a different approach is needed to empower people to participate and take control of their own life and environment.

In this introduction we start by looking first at the term design before we move on to the notion of 'co-' design and the delineation of the purpose and scope of this review.

Co-design is becoming important in the face of complex social, political,environmental, educational and technological issues, where no one person has the knowledge and skills to understand and solve them, and where a different approach is needed to empower people to participate and take control of their own life and environment.

1.1 The term design

To understand co-design it is important first to clarify the notion of design. Design is a task in which people seek to understand, interpret and ultimately address a challenge or opportunity in their present reality by conceptually developing and creating things (e.g. spaces, physical products, services, infrastructures, policies etc.) that could create a (better) future reality. Framing and making sense of 'problems' in a present situation while at the same time developing 'solutions' that could shape a better future is a key characteristic of design activity. Design evolves by progressively developing more specific knowledge about a particular situation and more specific descriptions of the plausible solutions that would create a future envisaged reality.

In the literature, design is approached as a distinct way of 'thinking' that has its own logic and way of doing things; as a distinctive 'practice' that has its own methods and tools; or distinctive 'knowledge' production activity.[1] Different researchers and practitioners would define the uniqueness of design (and co-design activity) differently by emphasising different characteristics of *design thinking* and practice, such as, for example, the capacity of 'conceiving, planning, and making', 'framing problems and solutions', or 'sense making'.[2]

Across this spectrum, the object of design is ultimately the conceptual development and creation of 'things', whether physical or digital objects, products, systems, spaces, or infrastructures but also intangible things such as processes, strategies, or policies. These 'things' do not exist or become specified in a vacuum. They are specified in tandem with a certain context. For instance, a public space is specified not only by its physical characteristics (form and configuration of spaces) but also in relation to the community life and activities that take place in it. A program for addressing issues of social isolation may involve the development of a technology but also processes, for example, for developing digital literacy, or reaching people from different social or cultural backgrounds. What is created by design is not (only) a 'thing' but also a 'context' that specifies the needs, actors and uses of the thing. In this sense, for some practitioners and researchers, the key object of design needs to be thought of not (only) as a 'thing' but (also) as a 'socio-material assembly', human and non-human elements assembled together around a certain matter of concern.[3] Indeed, some authors use the term 'Thing' (with a capital T) to refer to these 'socio-material assemblies'.[4]

In this discussion, it is important to distinguish two related but distinct categories of Things: those that constitute the 'object *of* design', the (socio-material) things that are designed, constructed and ultimately used in order to respond to a problem or matter of concern; and those that constitute the 'objects *for* design', the (socio-material) things that are designed and used to enable people to engage and collaborate in a design task (e.g. to assist in representation, communication and collaboration).

1

For design as a way of thinking see: Rowe 1987; Brown 2008; Lawson 1980; Dorst 2015. For design methods see: Jones 1970; Sanoff 1999; Bratteteig, Bødker, Dittrich, Mogensen and Simonsen 2013. For design as a way of knowing see: Cross 2006.

2

Buchanan 2001; Dorst, and Cross 2001; Krippendorff 2006.

3

See also in this series Noorani and Brigstocke review on participatory research with more-than-human others.

4

Bjögvinsson, Ehn and Hillgren 2012b.

1.2 The term co-design

The prefix 'co' signals the collaborative, cooperative, collective or connective nature of this engagement in design *(Figure 1)*. So, **co-design means** that people come together to conceptually develop and create things/Things that respond to certain matters of concern and create a (better) future reality. People come together despite, or because of, their different agendas, needs, knowledge and skills. The task may involve academics, practitioners and communities of place/interest that work together in order to make sense of certain situations and conceptually develop ideas into solutions. People involved in co-design may or may not be trained/professional designers, at least in the traditional sense of the term (such as graphic designers or product designers).

There is a spectrum of ways in which people may connect or work together *(Figure 1)*. People may **collaborate** when they work together towards a common interest or project. For instance, a local community may work together with academics and third sector organisations to develop shared knowledge and together generate ideas and solutions for social isolation of elderly people. In other cases, collaboration is not steered towards a common goal. It may involve groups that have conflicts of interest and fundamentally different needs. In this case, people may **co-operate** as they find synergies across essentially different interests or projects but nevertheless work independently from each other to serve their own objectives. In other cases, the emphasis is on eliciting knowledge, values and ideas from different people and mobilising their **collective** creativity. For instance, a health organisation that works with people with mental health issues may gather together its users/patients to learn from them and ultimately co-design a new service. Finally, people may simply **connect** their actions and resources – an example of this is the Open Design movement, where distributed users (typically on a digital space) share and contribute information that can be used to develop physical products, systems, or other solutions for different localities.[5] All these are possible expressions of co-design practices, distinguished on the basis of how strongly they focus on shared goals and working practices. In some cases, the emphasis is placed on working together (collaborative and cooperative) while in others there is a tendency to work independently (collective and connective). Also, while in some cases there is a strong commitment to finding and working towards common goals and values (collective and collaborative), in others, there is a strong emphasis on individual (or multiple) goals and values (connective and cooperative).

[5]
See in this series Bonacchi, C.
Co-producing Knowledge Online.

Co-design means that people come together to conceptually develop and create things that respond to certain matters of concern and create a (better) future reality. People come together despite, or because of, their different agendas, needs, knowledge and skills.
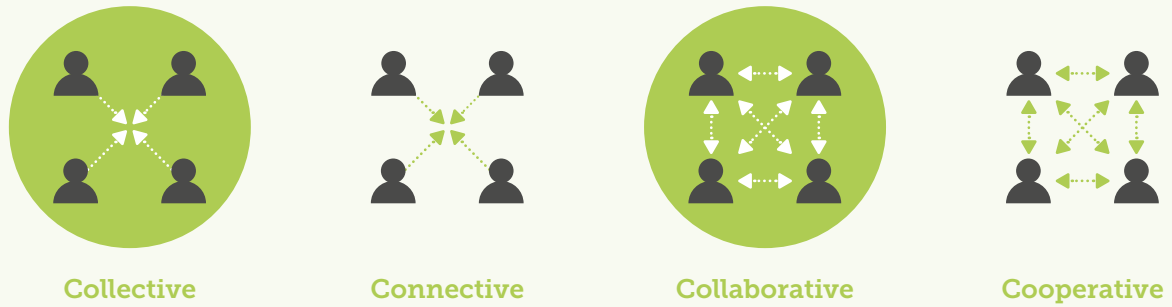
Collective **Connective** **Collaborative** **Cooperative**

Figure 1
Diagrams showing different types of co-design distinguished on the basis of how people may connect or work together.

Overall in co-design, people collaborate, cooperate or connect their knowledge, skills, or resources in order to engage in a design task by responding to the following four interrelated (design) questions:

— **What could the future be that would make the present better?** In co-design people envisage potential and desirable futures.

— **What exists in the present/past that compromises or creates opportunities for the future?** In co-design people are seeking to make sense of their current situation, its meaning, challenges or opportunities.

— **What could create the envisaged future?** In co-design people specify things or 'Things' that can respond to a current problematic situation and create an envisaged future.

— **Who and How will they engage and respond to these questions?** In co-design people need to identify *who* needs to engage, participate and respond to these questions, *what* will be the purpose of their engagement (e.g. to provide information, generate ideas, evaluate ideas) and *how* they will engage (i.e. through what processes and tools).

The key task in co-design is, therefore, the negotiation, creation and development of socio-material structures and processes that would bring people together and help them respond to the above questions. Different people may engage by taking different roles: for example, people may play a role in facilitating or engaging others in design tasks, or they may be sharing, collecting, interpreting or creating knowledge, ideas and resources. Different people may also engage at different levels and/or stages of a design project. For example, the Design Council's double diamond model suggests that engagement in design may include engagement in a process starting from 'discovering' needs or opportunities that arise in certain situation, through to 'defining' a particular focus of interest or problem to be addressed, 'developing' possible ideas that could respond to this situation and finally 'delivering' a (prototyped) solution (e.g. a place, product, service or process) to a particular problem or opportunity. [6] But co-design may also continue to take place beyond the timeline of a project ('design after design') as people develop their capacity and continue to engage in key design questions after the delivery of a specific solution. [7]

[6]
Design Council 2015.

[7]
Ehn 2008: 92–101.

1.3 The purpose and scope of this review

The term co-design is used in this review as an umbrella term that covers a wide range of different practices with different historical roots. There are many related terms such as 'participatory design', 'user-led design', 'community-led design', 'citizen-led design', 'collaborative design', 'cooperative design', 'collective resource approach' or 'socio-technical design' – just to name a few. All these related terms emerged in different contexts, and have been driven by different motivations and often also different ideological, epistemological and methodological standpoints.

This review aims to explain the meaning, core concepts and historical roots that shape the landscape of co-design. It particularly focuses on co-design practices that involve academics, practitioners and communities of place/interest. This includes the 'co-design *of* research', where different people (academics, practitioners and public) lead the conceptual development and production of a research programme, and 'co-design *as* research' where people use co-design practices as a method for developing knowledge and ideas for change.

The review is organised as follows:

— **Section 2** presents the historical roots that shaped the landscape of co-design.

— **Section 3** draws out some core notions and dimensions of co-design practices in order to understand their relation and contribution to research.

— **Section 4** presents some examples of co-design that further demonstrate and clarify the spectrum of co-design research.

— **Section 5** offers some conclusions and discussion.

This review aims to explain the meaning, core concepts and historical roots that shape the landscape of co-design. It particularly focuses on co-design practices that involve academics, practitioners and communities of place/interest.

2.
THE HISTORICAL ROOTS OF CO-DESIGN

Historically, the core ideas of co-design emerged in different social, geographic and disciplinary contexts. *Table 1* provides a quick summary of these traditions, distinguished on the basis of the context within which they emerged as well as the main concepts, interests and motivations behind them. The titles given for each tradition are chosen so as to highlight their focus in terms of the main actors engaged in the process. The first tradition focuses on the collaborative work of a community, the second focuses on cooperation between adversaries that form socio-technical systems, the third on *co-creation* between users and design experts, and the fourth focuses on citizen-led social innovations. Despite a number of intellectual connections between the different traditions, our argument is that these traditions are to a certain extent independent from one other.

Table 1
The key traditions of co-design.

	Community Design	Socio-technical Design	Co-creative Design	Social Design
(Historical) Context	Democratic design in architecture and planning	Democratic design of socio-technical systems	Innovation in service and product design	Social change, and social innovation
Key Interests	Community building Consensus building	Cooperative action between adversaries Polyphony	Learning from the collective creativity of potential (users) Co-created value	Making use of the power of connecting people Social good
Key Concepts	Participation, communicative action	Participation, infrastructuring, agonism	Generative research, tools for engagement	Creative citizenship, design activism, DIY and self-help practices
Key Motivations	Democracy and sustainability	Democracy	Innovation	Social innovation and sustainability

2.1 Community design

One of the key roots of co-design can be traced back in the early 1960s, developed as part of the human and social rights movements in the United States but also as part of widespread community action in Britain against large redevelopments and rehousing programs that were considered as a threat to local communities.[8] During this period there was a growing sense that people should have the right to participate directly in shaping and managing the places they live in. A growing number of young practitioners in architecture and planning emerged, advocating the importance of community engagement in the design of buildings, settlements and ultimately cities. They often brought their offices within local communities and used public spaces to engage families and local residents into designing their homes with them. These practitioners brought to the fore a wide spectrum of practices that focused on community building, consensus building, visioning, participatory action research and community technical aid. A wide range of different terms has been used to describe such practices, such as 'community architecture', 'community design', 'participatory architecture' or 'participatory planning'.

The intellectual foundations

Some of the earliest influential writing in this tradition was Jane Jacob's critique of post-war planning in 'The Death and Life of Great American Cities', John Habraken's 'Supports', Colin Ward's 'Housing: an anarchist approach', and Turner and Fichter's 'Freedom to build', who proposed alternative, bottom up and participatory, approaches and methods for the design of the built environment.[9] During the same period the work and publications of Christopher Alexander on Pattern Language was also particularly influential.[10] In the context of urban planning and regional development, a lot of this work focuses on the socio-political foundations of civil participation and the understanding of the political and policy frameworks that empower community action, while in architecture the emphasis has been more on practical methods and practices for engaging communities in design.[11]

Key concepts and models of action

By and large within this tradition, co-design has been understood as a process of collaborative rationality: 'a process of interactive collective reasoning, carried out in the medium of language, in discourse'.[12] Co-design, therefore, has been approached as a form of *communicative* action that needs to be understood in relation to Habermas' Theory of Communicative Action and Deliberative Democracy.[13] This means that community design has been conceptualised as an act of collaborative reflection and argumentation about beliefs and ideas for the future. A characteristic manifestation of this conceptualisation has been the use of public spaces as workshops, public debates or clinics, where local residents, authorities and professionals would reflect and communicate their key concerns about a place but also shape, share and defend their principles, values and ideas for the future. Typically, professional architects or planners would facilitate these conversations by playing a role as mediators, advocates of disadvantaged social groups, 'technical aid' experts, and/or 'translators' turning conversations into specific design proposals.

8
Sanoff 2011; Wates and Knevitt 1987.

9
Jacobs 1961; Habraken 1972; Ward 1976; Turner and Fichter 1972.

10
Alexander 1977.

11
Forester 1989; Innes 2010; Gallent and Ciaffi 2014; Sanoff 1999.

12
Healey 1997: 53.

13
Habermas 1981.

The key ideal underlying these practices has been 'community building' – namely, the strengthening of people's relations with each other and their place – as well as the recognition and negotiation of conflicts between stakeholders with opposing agendas and power relations. Within this context, community design, at least during the early years, placed a lot of emphasis on developing practices that focus on conflict resolution and consensus building *between stakeholders.*

2.2 Socio-technical design

Another key root of co-design emerged in the context of technology development – under the name 'cooperative design', 'collective resource approach', 'socio-technical design' or the 'Scandinavian tradition in participatory design'. This tradition of co-design has its roots in Scandinavia (Norway, Sweden and Denmark) and post-war political movements in the 1960's around industrial democracy. It grew out of the premise that industry should be democratised and offer opportunities for direct engagement of workers in the management of their workspace as a means to empowerment as well as to increase productivity and efficiency.[14]

In 1971, The Norwegian Iron and Metal Workers' Union (NJMF) initiated a project, which is now considered as the birthplace of the collective resource approach in participatory design. The project aimed to give workers the opportunity to influence the design and use of computer applications in their work.[15] This was followed by the DEMOS projects in Sweden and DUE project in Denmark.[16] A core characteristic of this approach was the collective build-up of resources and knowledge based on people's own experiences in order to empower them to develop their own ideas and act in their current situation.[17] This included providing time for workers to work with their peers and opportunities for training and education in order to develop skills for participating in design and development programs, but also the space to develop their own line of investigations. The term 'cooperation' was originally used to describe the idea that workers and managers could directly (face to face) or indirectly (through different sessions) work together to develop knowledge and ideas that could make their work environment and projects more meaningful from their point of view. The term 'participation' was used subsequently to describe the idea that workers (and managers) participate in these sessions.

The intellectual foundations
Historically, this view of co-design has strong intellectual foundations in participatory action research and situated learning but also links to the agonistic participatory model in design. According to this perspective, co-design should not presuppose the need for consensus between different stakeholders, but instead should focus more on facilitating polyphony and agonism between adversaries. While other traditions give more emphasis on the process of community building and consensus building (e.g. community design), this tradition often emphasises the importance of power relations and the role of eliciting conflicts as a source of diversity of voice and divergent possibilities. These core premises align with the notion of 'agonistic democracy' introduced by the political theorist Chantal Muffee.[19]

14
Kensing and Blomberg 1998; Gregory 2003.

15
Nygaard 1979.

16
Ehn and Sanberg 1979;
Kyng and Mathiassen 1982.

17
Bødker 1996.

18
See Wakeford and Sanchez Rodriguez's review on Participatory Action Research in this series; Björgvinsson, Ehn and Hillgren 2012a.

19
Mouffe 1999.

Key concepts and models of action

An overarching concept in this tradition is that of *'infrastructuring'*. According to this perspective, the focus of co-design moves away from the aim of designing things (objects) towards the aim of designing 'Things' (socio-material or socio-technical assemblies). This means that the emphasis is not the collaborative development of a new thing (e.g. a building, service or product) but the development of socio-material assemblies (i.e. collectives of human and non-human resources) that provide the resources for people to become future drivers of design activity. The use of the infinitive, '-ing' on infrastructuring, highlights how infrastructures are not first designed then used, but instead are made in use.[20] Infrastructuring is happening through approaches such as hands-on workshops or open labs that focus on building working relations between participants and ultimately creating the conditions for a common action/learning. These are usually open-ended situations, where participants continuously try out possibilities and test them in real settings.

2.3 Co-creative design

During the late 1990s, (global) private companies, national governments and public bodies were seeking to develop innovations in their services and products through citizen/user involvement, co-creation and design thinking. Prahalad and Ramaswamy are usually credited for more explicitly introducing the concept of 'co-creation' to describe the approach where 'informed, networked, empowered and active consumers are increasingly co-creating value with the firm'.[21] In parallel, there has been an increasing volume of literature around the idea of 'user-led innovation' where firms and government bodies come together with users or citizens to create new services or products.[22] An important element of these developments has been the adoption of 'design thinking' strategies: that is, the creative practices or strategies that designers typically use, such as techniques and methods for provoking inspiration, finding patterns, framing problems, generating ideas, making ideas tangible and creating prototypes. These are approached as generic strategies that can be applied to address challenges and opportunities in any context. These new developments have been supported by the proliferation of 'Design Thinking' approaches in product and service design, both by private design consultancies, such as IDEO, Frog, ThinkPublic, Engine, and public bodies such as the Design Council in UK, MindLab in Denmark, SITRA in Finland and Region 27 in France.[23] Historically, it is in this context that the very term co-design has emerged. The prefix 'co-' was used as an abbreviation of 'com' (i.e. 'with') in order to denote the focus on 'design *with* users' (instead of design *for* users or design *by* users). For the purpose of this review, we will be using the term 'co-creative design' – as opposed to co-design – in order to avoid confusion and to denote a focus on the collective creativity of users, who may not necessarily be connected in a collaborative or cooperative way with each other but they work together with expert designers. This is a school of thought where people are approached as users or potential users of a service or product and they are not necessarily seen as stakeholders with conflicting agendas and interests (although they may have different viewpoints).

20
Karasti 2014; Ehn,
Nilsson and Topgaard 2014.

21
Prahalad and Ramaswamy 2004.

22
Von Hippel 2005; Bason 2010.

23
Mulgan 2014.

The intellectual foundations

The intellectual foundations of this tradition are grounded on the view of design as a distinct discipline (i.e. a distinct set of skills and knowledge) that cuts across different professional domains. This view can be traced back in the late 1960s again, as part of the emergent studies of design using systems thinking, cybernetics and psychology. During that period there was a growing realization that design is a creative and iterative 'process' (involving analysis, synthesis and evaluation) that allows people to identify and achieve certain needs.[24] This process has been seen as common across different domains (from architecture to policy making) but also applicable in all aspects of our life. Starting from this tradition, two divergent perspectives were created: the view of design as a problem framing/solving process; and the view of design as a reflective practice. The former was based on the seminal work of Newell, Shaw and Simon on human problem solving and, more specifically, the view of design as a type of information processing activity. The latter view was based on the work of American Pragmatists, in particular that of Dewey, and the view of design as a way of developing knowledge through cycles of action and reflection.[25] Based on these intellectual roots, during the 1980s and 1990s an extensive literature on design as a distinct way of thinking grew, which formed the intellectual foundations of this tradition.

Key concepts and models of action

A key premise in this tradition is that everyone is creative and that everyone has the natural ability to engage in design as long as the right processes and tools are provided. Another key premise is that complex problems can be understood and addressed by connecting the skills and expertise of different people. Based on these premises, creative and 'design thinking' can be facilitated (typically by experts) using certain methods or tools and techniques. This typically involves hands-on activities and materials that focus on eliciting the creative and reflective capacity of people and facilitate the collaborative development of ideas and knowledge. An important manifestation of these premises emerges with the work of Sanders and Stappers and the notion of 'generative design research'.[26] The focus of this work is the generation of a shared, usually visual, language that enables direct communication and mutual learning between different people (typically designers, researchers and stakeholders). The idea is that this language and mutual learning is generated through 'tools' (and techniques) that enable people to express their feelings, thoughts or ideas. Another related idea is 'transformation design' where the emphasis is placed on the role of designer (rather than the tools and techniques) in connecting the skills and expertise of users (e.g. families that use local support services) with other stakeholders/ professionals (e.g. social workers, psychologists, doctors, local council officers).[27] The key element is the immersion of a 'designer' (as a moderator) into a problematic situation with the objective to bring to the fore current experiences from different stakeholders, elicit future aspirations and facilitate the co-creation of solutions that would transform the interaction and experiences of the involved parties.

A key premise in this tradition is that everyone is creative and that everyone has the natural ability to engage in design as long as the right processes and tools are provided.

24
See for instance, Asimow 1962.

25
Newell and Simon 1972; Schön 1983.

26
Sanders and Stappers 2014a.

27
Burns, Cottam, Anstone and Winhall 2006.

2.4 Social design

Towards the end of the 1960s, there was a growing realisation that designers play a vital role in our society and as a result have a responsibility to look at the environmental and socio-economic needs of people. They also saw the potential of design practice to act as a force for social change and innovation by drawing on the connective action of people. A number of design-led movements during this period aimed to provoke and actively engage the public in re-thinking their designed environment. One of the key movements was the Italian *Radical Design* movement. Design activity was perceived as a vehicle for protesting against a consumption-led society, protecting the natural environment and provoking established design norms.[28] Progressively over the years, the engagement of citizens with such creative and design practices has become more direct: design activism, Do-it-Yourself practices and social entrepreneurship have emerged as important practices associated with the broader term 'social design' and 'creative citizenship'.[29] Although the boundaries of these practices may often merge with other forms of community design or socio-technical design, the important element is the emphasis on the creative everyday practices of citizens as individuals situated in complex networks rather than on notions of community, participation or cooperative action.

[28]
Raizman 2010.

[29]
Armstrong, Bailey, Julier and Kimbell 2014;
Hargreaves and Hartley 2016.

The engagement of citizens with creative and design practices has become more direct: design activism, Do-it-Yourself practices and social entrepreneurship have emerged as important practices associated with the broader term 'social design' and 'creative citizenship'.

The intellectual foundations

As mentioned, the intellectual foundations of this manifestation of co-design can be traced back to the Radical Design movement in Italy but also more broadly in the influential publication of Victor Papanek on 'socially responsible design' and growing ideals for 'designing for society' as opposed to designing for customers.[30] More recently, the book of Alastair Fuad-Luke on design activism and subsequent publication by Thomas Markussen on the subject has provided a renewed articulation focussed on design practices and outputs that disrupt existing norms and values, and that offer new ways of inhabiting and experiencing reality but also invite active engagement of others.[31] Although the focus of these contributions is often practices led by professionals, the work of Ezio Manzini on citizen-led design practices has been very influential at connecting more explicitly the everyday creative practices of people to social innovation: that is the development of 'new ideas (products, services and models) that simultaneously meet social needs and create new social relationships or collaborations'.[32] In parallel, the notion of 'creative citizenship' has emerged to connect the everyday creative practices of individuals with the capacity of highly interconnected society to address complex social issues.[33] Moreover, the 'open design' movement, at the beginning of the 1990s, although rather independent as a movement, had been a very influential manifestation of the idea of co-design as a practice that is making use of the connectivity of people (in this case offered by the Internet). Open Design is based on the principles of open source movement in software design and alludes to the development of designs (e.g. products, services, buildings) through the use of publicly shared design information.[34] What is common in all these emergent practices was they all make use of the creative capacity (e.g. knowledge, meanings, ideas, resources, collaborations) that emerges by simply connecting individual actions.

Key concepts and models of action

The key intellectual shift in this tradition was an increased explicit or implicit interest in the notion of citizenship and in particular a notion of citizenship as a creative act that is situated in a complex and highly interconnected public sphere. Citizens are approached as creative individuals that form and act within creative networks that have the capacity to produce new services, events, places or products and ultimately produce new networks. In some cases, these practices are conceptualised as self-help and 'Do-it-Yourself' practices, while others as acts of social entrepreneurship that aim to address needs that are not addressed by the public or private sectors.[35] Again, in other cases where the focus is on disrupting or re-interpreting existing norms and experiences and instigating change, these practices are seen as expressions of design activism. Co-design is conceptualised as the distributed creative practice of people that may work independently and with different objectives but at the same time connect with each other (e.g. share information, inspire, mobilise). Within this conceptualisation, key notions are the relation between local practices and global actions or movements, the circular relation between production and consumption and the deconstruction of the relation between experts and non-experts.

30
Papanek 1971; Parsons Whitely 1994.

31
Fuad-Luke 2009; Markussen 2013.

32
Manzini 2015; Murray,
Caulier-Grice and Mulgan 2010: 3.

33
See specifically Harte, Dovey,
Agusita and Zamenopoulos 2016; and
Zamenopoulos, Sobers, Alexiou,
Chapain, Alevizou and Williams 2016.

34
Van Abel, Klaassen, Evers and Troxler 2011.

35
Ratto and Boler 2014;
Martin and Osberg 2007; Mawson 2008.

3.
KEY DIMENSIONS
OF CO-DESIGN

This section examines in more detail core elements of co-design as a way of knowing and how they vary across the different traditions. The focus will be placed on three key areas that need some attention during the development of any co-design activity or project, that is:

— **The politics of co-design:** this refers to the overarching ideals, principles and objectives of co-design activity.

— **The practices of co-design:** this refers to the approaches, methods and tools that are used during co-design.

— **The epistemology of co-design:** this refers to the type of knowledge that is produced during co-design.

3.1 The politics of co-design

The politics of co-design refers to the underlying ideals, principles and governance structures that determine the people or parties that need to be engaged in co-design activity, the reasons for their engagement and, crucially, the ways that these people should be engaged in co-design activity and connected to other people. In other words, this section focuses on the fourth key co-design question presented in the introduction: *Who* is engaged in co-design, *How* and *Why?*

The question of *who* is engaged in design is quite complex. In general, all different co-design traditions will seek to include people or parties whose life is affected by a certain change (because of associated risks, costs or benefits) or whose knowledge and input could be useful for aspects of the co-design activity.[36] But this is a very general principle that comes with some contradictions. Co-design also comes to exclude people, issues and actions. In certain cases, exclusion is part of a deliberate attempt to frame a specific focus and identity in a co-design activity, while in others it is the result of pragmatic constraints related with the number of people, groups and range of issues that can be tackled or the actions that are possible to be taken. The classification used below is loosely based on Richardson and Connelly's work.[37]

In terms of *inclusion and exclusion of people,* co-design activity may involve only *representative groups* (formal or informal parties) that are selected based a certain rationale, *closed partnerships* between representative groups and agencies (i.e. public sector, third sector organisations and academics), *open partnerships* where any group or agency can join under certain conditions or indeed *open structures* where every individual can join. In the above classification it is also worth considering who are the agents that initiate and drive the co-design process. Many co-design initiatives for example emerge from the

36
Clarke 1996; Abbott 1996.

37
Richardson and Connelly 2005.

grassroots, from groups that form because of some common interest or concern. In other cases, co-design activities come to being as projects that are initiated, managed and coordinated by people in some place of power, whether because of their expertise, access to information or resources, or ability/capacity to influence decision making. In any case, co-design in principle aims to engage and give voice to people who are disadvantaged or marginalized, whether because of socio-economic, cultural, physical or mental attributes.[38]

In terms of *inclusion and exclusion of issues and actions,* co-design may include or exclude issues and actions both for pragmatic but also for strategic reasons. In certain cases, there is a **conflictual approach** to co-design, where conflicts and differences on what are the key issues or the best ideas for the future are expressed within a public arena and progressively addressed through the use of argumentation and mutual learning. The key assumption is that people can move positions and mindset to build consensus through sharing of information and knowledge. This follows the Habermasian ideal of communicative rationality that has been very dominant in the community design tradition. In other cases, there is a **non-conflictual approach** to co-design, where consensus is built by focussing on areas where there is a common interest – so certain issues or actions can be excluded to facilitate agreement. Finally, there is the **agonistic approach,** which has been extensively articulated within the socio-technical tradition, and where consensus building is not possible or indeed desirable because argumentation and mutual learning is biased by pre-existing power relations. In such cases, co-design has the duty to facilitate polyphony and agonism between adversaries that would lead to diverse knowledge and possibly variety of different actions.

But considering the question of who is engaged in co-design is intrinsically tied to the question of *why?* Why people would like to engage in co-design? To respond to this question we approach the politics of co-design under three key ideals or premises about the strategic objective of co-design:

Democratisation and Empowerment

One of the core strategic objectives of co-design, at least within the Scandinavian and community design tradition, is to approach co-design as a mechanism for the democratization of society and democratization of knowledge. The politics of co-design, such as the topics discussed above on the inclusion and exclusion of people, issues and actions, are not seen as external conditions for organising co-design projects but as the very object of co-design.[39] A corollary of this objective is the view of co-design as a mechanism that has the objective to help people and communities to unlock and develop their emotional, cognitive and/or social capacities as a community to participate in design.[40] The development of this knowledge and capacity is a form of power: the 'power to act'.[41] In this sense, co-design is a mechanism for empowering people, namely a mechanism for taking control over their own futures by developing their own ideas, knowledge and skills to respond to a given situation. Co-design contributes to democratization and empowerment because it can facilitate the closing of the gap between people who have the power to shape important aspects of their life, such as health, welfare, or built environment, and those who do not. On this basis, co-design re-distributes power to disadvantaged or marginalized groups within society.

38
See for instance:
Fails, Guha and Druin 2013 or
Ehn, Nilsson and Topgaard 2014.

39
Binder et al. 2015.

40
Sadan 1997.

41
Gaventa and Cornwall 2008.

Innovation and Knowledge

Another commonly held strategic premise that shapes the politics of co-design is the view that co-design becomes a source of new knowledge that can be turned into a meaningful and useful solution. This is based on the premise that people hold precious knowledge related to their own situation and circumstances, which external experts lack, and which can only be unearthed as people actively engage in design. At the same time, this kind of knowledge is key to the generation of new ideas and their development into solutions that can be meaningful and useful to the people involved. In this sense, the engagement of people in design is a source of innovation. Different traditions give different interpretations to this premise. For instance, from the perspective of co-creative design this premise is about building capacity in business, public bodies and social enterprises to develop innovations in their outputs or similarly build capacity through co-design in developing knowledge innovations. The emphasis is predominantly placed on the originality of knowledge and the knowledge advantage that is created by having access to the mindset of future users. In socio-technical and social design traditions the emphasis is placed on notions of the 'social' and 'social innovation' in particular. In the context of those two traditions, the engagement of people in design is about the creation of the 'condition for the social', meaning the creation of 'networks and relations' where mutual learning process take place and key social challenges and inequalities are addressed by building capacity for action. [42]

Sustainability and Relevance

The politics of co-design is also shaped by the view of co-design as a practice that creates more meaningful and relevant futures for people that are engaged in the process, and as a result contributes to their social, economic and environmental sustainability and resilience. The underlying argument is that co-design enables people to take ownership of their environments, services or products and, therefore, creates stronger and more meaningful connections among people and these creations. In community design, this argument has its historical roots in approaching co-design as a tool for protecting local communities from large redevelopment and regeneration plans. In social design, this argument has its roots in approaching co-design as a socially responsible action. In this context, the participation of people in design is a key practice (and mindset) for developing more sustainable and socially responsible futures. [43]

42
Emilson 2014; Binder, Brandt, Ehn and Halse 2015.

43
Melles, Vere and Misic 2011; White and van Koten 2016.

Co-design enables people to take ownership of their environments, services or products and, therefore, creates stronger and more meaningful connections among people and these creations.

3.2 The practices of co-design

The 'practices of design' refers to the question of what do people actually do during co-design, how people or groups are supported to engage in it and what are the principles, approaches, methods and tools used for knowledge production during this activity. Of course, there is a very large variation that is impossible to cover here but the intention will be to reveal some general ideas that seem to be key to co-design practice.

3.2.1 The people: what are the roles of engagement in co-design?

Co-design is often associated with the formation of a 'group' of people that will lead and manage the co-design process (e.g. lead the organisation of meetings, workshops or events). As follows from the discussion on the politics of co-design, this group may be an open or closed group of people that effectively constitute *'a community of co-design practice'* or, in other cases, this group may be *'a representative group of a community'*. In both cases, it possible that there is *'a wider community'* that is an extended **community of (potential) users** or beneficiaries associated with the community or representative group and their co-designed outputs. People from the wider community contribute in the co-design process with their knowledge and expertise but they do not necessarily lead the processes or have the role to engage others in co-design.

Engaging others in design requires thinking about the objectives of engagement: i.e. what is the purpose of the engagement? Here are some examples:

— **To share and generate:** to share experiences, provide information, knowledge and/or generate ideas for responding to key co-design questions.

— **To debate and evaluate:** to provide feedback or comments on existing responses to the key co-design questions.

— **To collect and organise:** to collect, analyse and synthesise information, knowledge or ideas related to the core co-design questions.

— **To enable and facilitate:** to shape, enable or facilitate the processes and tools of engagement in design.

Professional experts and researchers
The capacity (i.e. the expertise, time and other resources) to carry out a co-design process may be naturally developed within a group but, in many cases, this capacity is injected in the form of researchers or other relevant professionals (e.g. designers or development officers). These professional experts and researchers may play different roles within the group and their role is crucial for the nature of the co-design process.

Here are some typical examples:

— **Enablers:** they inject processes and materials to support the engagement of people with co-design process and with the ultimate objective that in time their presence will not be necessary.

— **Facilitators:** they facilitate conversations and interactions between participants in order to make sure that some commonly agreed principles are shaped and respected.

— **Participant-Observers:** they observe the process and take a more or less active role at certain points to help reflection and evaluation of principles and actions.

— **Advocates:** they support disadvantaged groups and/or advocate the inclusion of certain people, issues and actions.

— **Translators:** they provide technical aid in complex design projects or, in certain cases, translate expressed needs and ideas into specific design solutions that are then further discussed with the group.

3.2.2 The task: what do people do when they engage in design?

It might be useful to understand co-design as a task where people (as individuals or groups) work at the intersection of two dimensions:

Working with time —
to relate the present/past reality with potential futures
In co-design people explore the relation between past, present and future. In a sense, they work in an imaginary time with the objective to relate their understanding about their actual situation with their understanding of potential future realities. One may see this as a form of 'time travel' exercise that aims to shape a picture of a present situation by looking at potential future realities and, equally, specify a future reality by making an interpretation of the present. In other words, people engage in design as they attempt to respond to the following two questions:

— What could the future be that would make our present better?

— What do we have now that compromises or engenders our future?

Working with abstractions —
to relate abstract principles with tangible things
In co-design people also work to progress abstract ideas and principles into more concrete 'Things'. In other words, people engage in design as they attempt to respond to the following two questions:

— What is our theory (principles, values, or ideas) about the world and the things that realise it?

— What are the instances (i.e. specification of Things) that respond to our theory?

Figure 2 illustrates the 'co-design space' composed by these two dimensions.

Future

Figure 2
An illustration of the 'co-design space' showing the two dimensions of a co-design task and the questions associated with them.
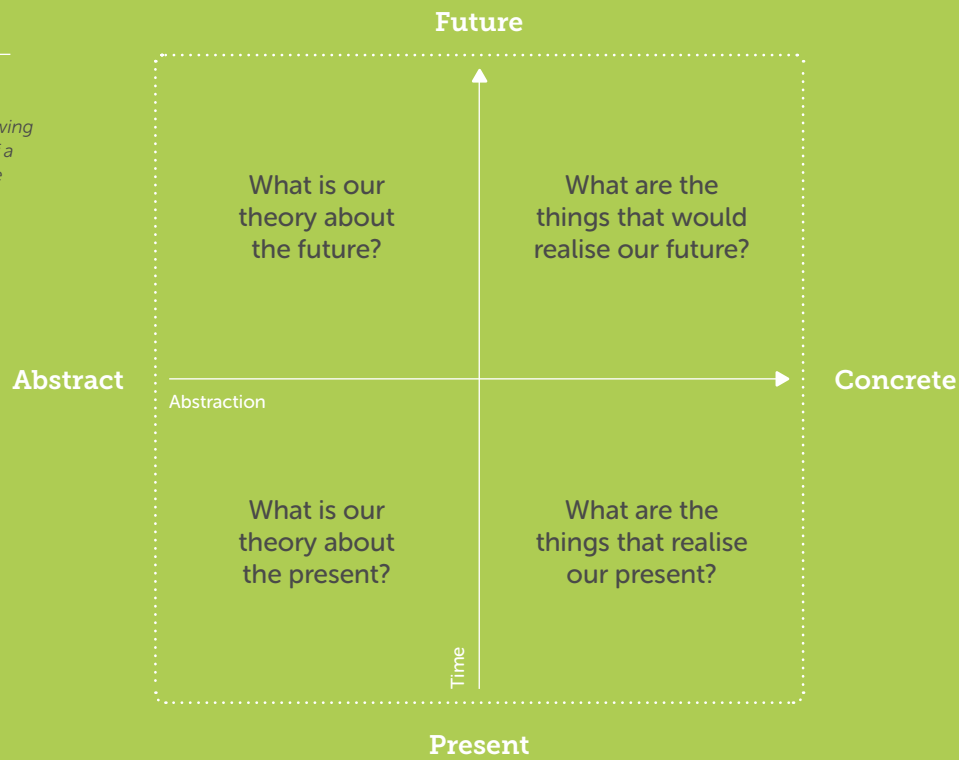
What is our theory about the future?

What are the things that would realise our future?

Abstract — Abstraction —————→ **Concrete**

Time

What is our theory about the present?

What are the things that realise our present?

Present

Future

Figure 3
Different mechanisms of co-design placed in the co-design space according to where they are usually employed in practice.

Projecting

Prototyping

Abstract — Abstraction —————→ **Concrete**

Time

Probing

Provoking

Present
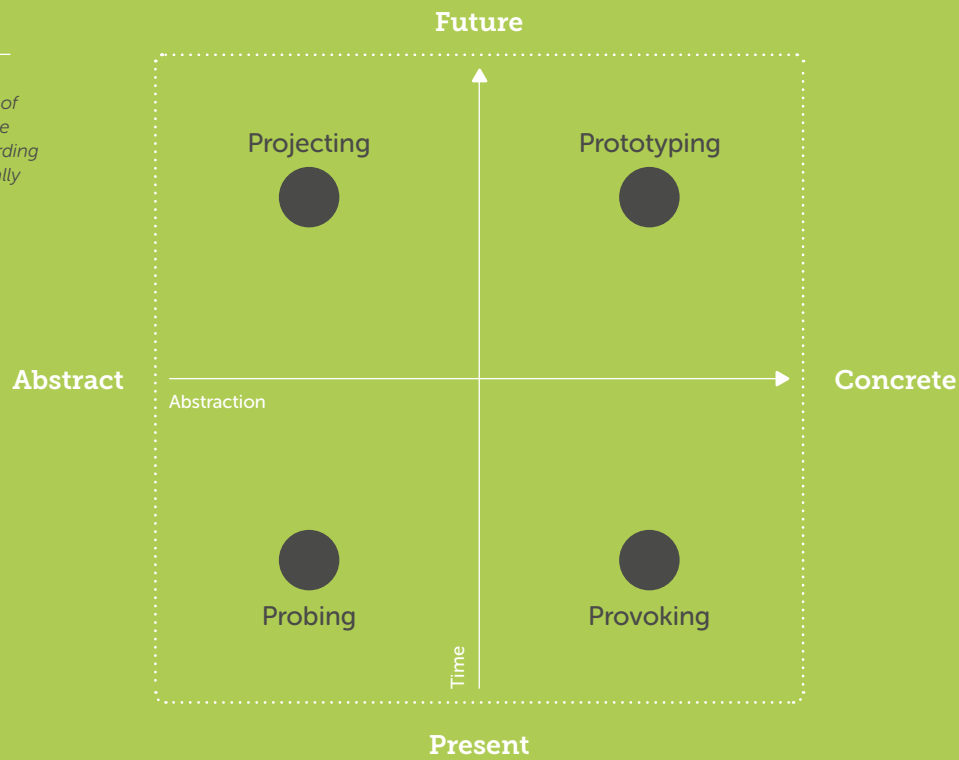
3.2.3 Mechanisms: places, processes and tools of engagement in co-design

Responding to the key co-design questions requires time and space for enabling individual and collective reflection. This time and space is created in public spaces, hubs, peer-to-peer networks, digital platforms, workshops or events within which co-design activity is enabled or facilitated. In the community design tradition, within the context of architecture and planning, a common vehicle is the notion of 'centres' (e.g. architecture centres, urban rooms, etc.) – these are spaces open to the public within which co-design practice takes place. Within the Scandinavian tradition, we often find the concept of a public laboratory, while within the user-expert design tradition the archetypical mechanism is a design workshop. In the social design paradigm we see a variety of different mechanisms from peer-to-peer networks to public workshops.

The mechanisms of co-design are also *processes, methods* and *tools* that can help people to engage in design activity. Processes may refer to general concepts, ideas or stages for carrying out a co-design project, methods refer to more specific instructions on how to carry out a set of activities while tools (and techniques) often refer to specific materials that help people to move step by step in design activities. All these are mechanisms for connecting people and helping them to develop a better understanding of their situation, their needs, values and ideas, imagine their future or conceptually develop ideas into solutions that could shape their future. These mechanisms invite participants to engage in *conversations, writing, enactment* or *making* and have a number of different functions which are characteristic of co-design practice:

—— **Probing** knowledge and meaning: co-design practice often develops mechanisms where people will use materials – such as cameras, audio recorders, diaries, interactive public games, etc. – with the objective to elicit knowledge, meaning and emotions that are usually implicit or hidden in the action of people. A widely known example is the development and use of cultural probes.[44]

—— **Provoking** reflections: co-design practice often creates 'things' (objects, visuals or situations) that have the objective to provoke critical thinking or behavioural change.[45] In certain cases, this is considered the end product of (co-) design activity but in others it is seen as explorative step towards the development of the appropriate mindset and understanding for co-design.

—— **Projecting** visions or ideas into the future: co-design practices are predominately occupied with methods and tools that can help people to generate ideas and create images of the future.[46] This may include simple forms of 'mood boards' or bricolage of pictures to more systematic approaches for exploring possible future directions and scenarios, such as interactive games or simulations.

—— **Prototyping** ideas and concepts: this is one of the most commonly referred mechanisms that characterises co-design practices. It refers to the actual development and testing of ideas that could create an envisaged future reality. Prototypes can play many different roles, such as testing a hypothesis or helping with the development of a theory about future realities.[47]

44
Gaver, Dunne and Pacenti 1999.

45
Disalvo 2015.

46
Bødker 2000.

47
Sanders and Stappers 2014b.

Figure 3 situates these mechanisms or strategies within the design space. Although these mechanisms can be used at any stage of the design process, here they are situated in this space on the basis of where they tend to be employed (i.e. what kind of question they typically aim to address). For a general discussion on co-design methods and tools within the socio-technical tradition the interested reader may see the section on Methods in Simonsen and Robertson. [48] Sanders and Stappers offer a general account that covers socio-technical and user-expert design, while examples from community design methods in the context of architecture and planning can be found in Sanoff. [49] For more specific design tools see Martin and Hanington. [50]

3.3 The epistemology of co-design

Finally, to understand what binds different co-design approaches together it is useful to discuss what types of knowledge they produce and how.

In co-design, knowledge is tied to praxis, i.e. action as distinguished from theory, and it has a pragmatic, practical value. It has strong intellectual foundations in Action Science, Participatory Action Research and American Pragmatism. [51] For more in this area, see also Wakeford and Sanchez Rodriguez's review on participatory action research in this series. One of the key principles here is the complementarity between knowledge and action. Co-design, as with all forms of action research, is described by spiral steps that form 'a circle of planning, action and fact finding about the result of the action'. [52]

The engagement of people in design activity has also been seen as type of *'abductive'* way of producing knowledge. [53] The notion of *abduction* was introduced by the American philosopher Charles Sanders Peirce and its precise meaning has evolved within his own writing but also in the writing of others in philosophy, logic and science more generally. In the context of co-design, an abductive research strategy would include the development of a construct (or a 'thing' in co-design parlance), which is then used and evaluated for its meaning and capacity to realise an envisaged reality and respond to actual needs and opportunities. This construct or thing embodies various forms of knowledge:

— Knowledge about current challenges or opportunities.

— Knowledge about a desired future.

— Knowledge of the things (e.g. places, services, processes) that would create an envisaged future reality.

The key corollary from the above observations is about the type of knowledge that is produced by co-design activity. Knowledge produced by co-design does not aim to identify universal and certain or probable truths. Design activity develops knowledge about the *plausibility* and *meaning* of future realities. This means that co-design is a type of research that *proves the possible existence of a certain reality* (but not its universality) and *generates an understanding of its meaning(s).* These are key properties of the knowledge that is produced by co-design and should be seen as a guide for the suitability of co-design research to address different research questions.

48
Simonsen and Robertson 2013.

49
Sanoff 2011.

50
Martin, and Hanington 2012.

51
On Action Science see, for instance, Friedman and Rogers 2008 and Argyris and Schön 1991.
For Participatory Action Research see, Fals Borda 2001. On American Pragmatism: Dewey 1938 and Peirce 1934.

52
Lewin 1946/1948: 206.

53
See March 1976 and Goel 1988.

4.
CASE STUDIES: EXAMPLES OF CO-DESIGN AS RESEARCH ACTIVITY

In order to illustrate the key concepts discussed and the contributions that co-design makes to knowledge we present and reflect on two research studies we were involved in that used co-design with community organisations and groups as a research tool.

4.1 Creative Citizens – Wards Corner

The first example is a study carried out as part of *Creative Citizens,* a research project funded by ESRC and AHRC under a Connected Communities and Creative Economy call. The Creative Citizens project sought to explore how media may complement, support and enhance the creative practices of individuals, groups and networks for the benefit of their communities (be it geographic communities, communities of interest or communities of practice). Key to this exploration was the principle of using co-design and co-production of media 'interventions'/ projects as a vehicle for eliciting and developing knowledge and potentially innovative practices. The Creative Citizens project had a strand focussed on community-led design, that is, on practices where citizens are engaged directly and creatively in the formation of solutions for their own environment whether physical spaces, buildings, neighbourhoods or services. The focus here is the collaboration between the Open University (OU) and Wards Corner Community Coalition (WCC), a grassroots community in London campaigning to save the market above Seven Sisters tube station and to put forward an alternative plan for the development of the place that preserves its heritage and builds on local social and economic capital.

The academic team were committed to producing knowledge and outputs of practical benefit – they did not position themselves as expert designers helping define design solutions, but as facilitators or enablers, helping create the conditions and build the group's capacity to design the project themselves.

Who was engaged in co-design and why (politics)?

This study was a direct collaboration between academics and a community group, while a third sector organization (The Glass-House Community Led Design) acted as a connector, initially helping identify the community and link the two parties together, and subsequently serving as an expert advisor. The community group had a horizontal organization with decisions taken at public meetings, however, for the purposes of the project two individuals often acted as mediators (one due to their role as the architect of the alternative plan and the other due to their interest in research and media). The academic team involved two lecturers (the authors), a research fellow and a part-time research associate (employed by the Royal College of Arts (RCA) which collaborated with the OU team in the community-led design strand).

Although WCC was not engaged in the formation of the initial research questions and high level plan, the intervention was co-designed. The community group had a key role in deciding objectives, content and plan of action for the media project with the academics acting as facilitators and playing a key role in structuring the process of co-design. A memorandum of understanding was created at the beginning of the collaboration and the project provided funding for the intervention. This included materials for workshops, funding for the media platform used (Stickyworld Ltd) and recompense for the time of the two individuals from WCC who were involved in the technical implementation of the media project.

The principles of collaboration were outlined in the memorandum of understanding, although some were more implicit. Each party came into the co-design process with their own values and objectives. The academics were interested in activities that would help advance the research questions of the project, they were the gatekeepers of the funding, and they introduced the idea of a media intervention as a precondition of the collaboration. Although the academics thus entered the collaboration from a position of power, there was an explicit commitment that the co-design process and outcomes would equally help advance the objectives of the community group and fit in with their existing plans. The community group had participated in research projects before, although not in a co-design project, and were apprehensive about the benefits of the collaboration initially as they expected to be 'subjects of research' dedicating their time for no obvious/practical benefit to them. The academic team were committed to producing knowledge and outputs of practical benefit, yet, in line with principles of empowerment, they did not position themselves as expert designers helping define design solutions, but as facilitators or enablers, helping create the conditions and build the group's capacity to design the project themselves (so the academics aimed to be catalytic for the project but not indispensible to the group).

How co-design happened (practices)

The process involved a series of interactions with the whole group as well as focus groups and meetings with key people, to explore existing capabilities and opportunities, generate ideas, define objectives and actions, develop a new design (media intervention) and evaluate the process and outcomes.

A key part of the process was the development and use of an *asset mapping* exercise. Asset mapping is a methodology used with community groups and organisations to help unearth, capture and visualise existing resources and capacities, which may otherwise lie undiscovered and underused.[54] The approach fitted the project objectives of helping unearth and build the capacity of the community group to carry out their project. The development of the asset mapping methodology involved an iterative process of testing and evaluating with the help of experts and community groups. The asset mapping exercise was instrumental to the process of co-production of knowledge, as it helped capture the group's knowledge of their current situation but also their aspirations for the future. It also helped make strategic decisions about the direction and role of the media intervention. More about the asset mapping methodology can be found in Alexiou et al.[55] *Figure 4* shows examples of asset maps produced by WCC.

Complementing the asset mapping exercise were a series of other group and individual activities, including a brainstorming workshop, and separate planning, reflection and evaluation meetings *(Figure 5)*.

As mentioned, one of the key outputs of the co-design process was a media 'intervention,' an online 3D virtual tour inside the group's alternative plan for their local market *(Figure 6)*. This online tool allowed the wider community to virtually step into the space, explore the current market, and find out about the design proposals and principles. It was used alongside a social media campaign, and a series of face-to-face meetings and events to engage local people (particularly market traders) in the debate, and to record their views and comments. The proposal received enthusiastic support and comments fed into the consultation process for the submitted community plan, which was approved by Haringey Council in April 2014.

54
Kretzmann, McKnight, Dobrowolski and Puntenney 2005.

55
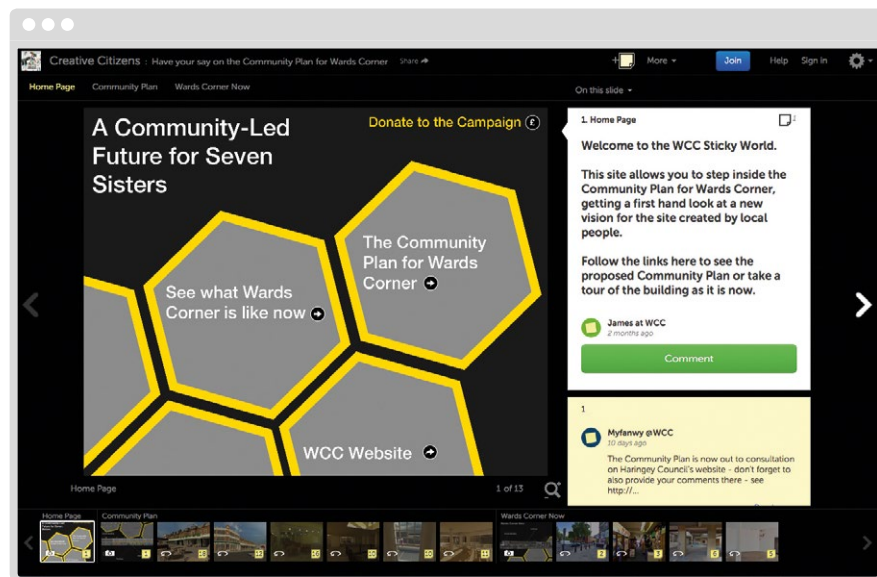Alexiou, Aguista, Alevizou, Chapain, Greene, Harte, Ramster and Zamenopoulos 2016.
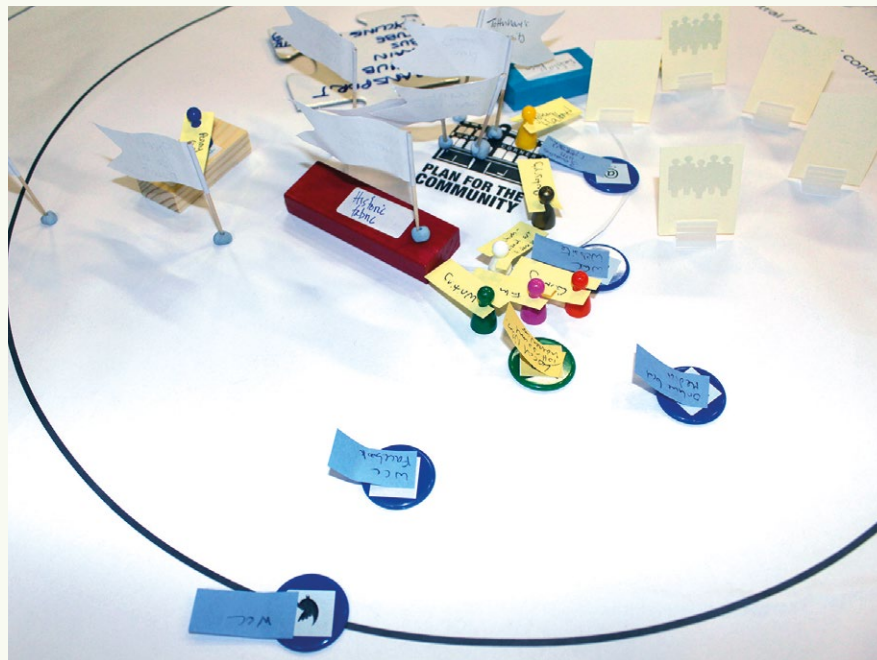
Figure 4
Examples of asset maps produced by WCC.

Figure 5
An image from a WCC co-design workshop.

Figure 6
A screenshot of the WCC Stickyworld,
the object of co-design.

Beyond the specific processes and tools for co-design however, there were also some important socio-material infrastructures supporting the co-design process. Apart from the financial support, as individual interviews verified, the project provided community members a very much needed time and space to reflect on their situation: on their practice, their objectives and their opportunities and possibilities. The project also provided opportunities for individual members to develop and sharpen their skills, which are transferrable to other situations (e.g. in community engagement, communication and graphic design).

For more about co-design with Wards Corner and in the Creative Citizens project see Alexiou et al. and Hargreaves and Hartley.[56]

4.2 Scaling up Co-design Research and Practice

The second example is a collaborative research project which was funded by the Arts and Humanities Research Council (AHRC) in a scheme that encouraged community-university collaborations by funding projects in two phases, with the first phase exclusively dedicated to co-design of research. *Scaling up Co-design* specifically focussed on exploring and developing ways to promote co-design within and across civil society organisations and their communities and to explore the role of co-design on extending reach and impact of social innovation.

Who was engaged in co-design and why (politics)
The project was multi-disciplinary with five academics (the two authors from The Open University, and colleagues from Northumbria, Sheffield Hallam and Brunel University) and six civil society organisations (CSOs). The participating CSOs were Fossbox, a social enterprise applying (open source) information technology to support the voluntary sector; Flossie, a network of women promoting open-source software for social innovation; The Glass-House Community Led Design, a national charity supporting communities engaging in planning and design of the built environment; Blackwood Foundation, a foundation that supports a distributed network of people with disabilities to explore design for independent living; Silent Cities, a social enterprise developing creative engagement using digital media so that people who are isolated and disadvantaged can flourish; and Westminster CVS, an organization providing support and advice to small voluntary groups.

The core premise of the research was that community empowerment requires innovations (e.g. programs, infrastructures or resources) that are developed organically and openly with communities – so that they have the necessary variety and adaptability to the objectives/values, practices and scale of communities. Based on this premise, a core strategic decision was to explore and make use of the diversity of medium and small sized CSOs. The assumption was that the agglomeration of different medium and small sized CSOs could offer access to diverse expertise, practices (ways of working) but also social capital and strong connections to specific communities and industries.

56
Alexiou, Alevizou and Zamenopoulos 2014;
Hargreaves and Hartley 2016.

Ideas and decisions about the objectives, research questions and methods of the study were developed collaboratively in project meetings, with each meeting being facilitated by a different combination of project partners. During the first phase of the project, the objective was to specify and agree on a general theme, research questions and methodological approach. During that stage it was expected that the team would reach a consensus. The team formulated the following research project objective: to design and prototype practical approaches for scaling up co-design practices within and across civil society organisations and their communities, but also to explore the role of these co-design practices on extending the reach and impact of civil society organisations. Methodologically, it was agreed that the project would generate a number of relatively independent sub-projects that connect partners together but that do not require consensus by the whole team.

So, during the second phase, a number of sub-projects were defined based on identified connections between the interests of partners but where there was complementarity of expertise. Each sub-project had a devolved power structure. All partners had equal access to resources for the delivery of project activities. In that respect, the scaling up project had some influence from the socio-technical design tradition: there was no intention to build consensus but the intention was to create a space where a number of relatively independent projects can be generated.

There was also an underlying preoccupation with the sustainability and resilience of CSOs and the transferability of methods, tools and skills developed in the project. This led to a key principle being adopted in project activities, to help develop 'ambassadors' of co-design, that is, to incorporate skills development in project activities (in areas of expertise of the CSO's) and support individual participants apply these skills further in projects of their own.

A key principle adopted in project activities was to help develop 'ambassadors' of co-design; to incorporate skills development in project activities and support individual participants apply these skills further in projects of their own.

How co-design happened (practices)

During the first phase of the project, the co-design process employed various approaches, in particular an approach for 'consensus building' and other 'value-based approaches' in order to frame the theme research questions but also establish some general principles and values of cooperative action.

In the second phase of the project, the team co-designed an approach for incubating cooperative projects which was named 'cross-pollination'. In the 'cross-pollination' process, each civil society partner identified live or emerging work relevant to research, as well as assets or resources that can be mobilised to create new projects. The group then identified sub-projects that were of particular interest and relevance to two or more partners. They considered what other practice-based and academic partners could enrich the project and contribute to joint learning, as well as individual learning and development. The partners also considered how the collaborations on the various sub-projects could help connect or 'cascade' the project to further collaborations outside the core team, within communities, academia, practice and industry. Finally, they considered how the collaborations could enhance the reach and impact within the communities in which they were being delivered. More formally, the project team designed a process for creating a sharing economy of interests and assets (skills but also material resources) that incorporates the following stages: *Sharing* values, skills and resources; *Connecting* existing projects and expertise to create project networks; *Framing* new projects; and *Cascading* knowledge and ideas to a wide network in order to critique and further develop ideas, collaborations and resources. In later stages, the cross-pollination process described above was formalised and accompanied with specially designed materials *(Figure 7)*.

Figure 7
Some of the materials generated for the cross-pollination process.
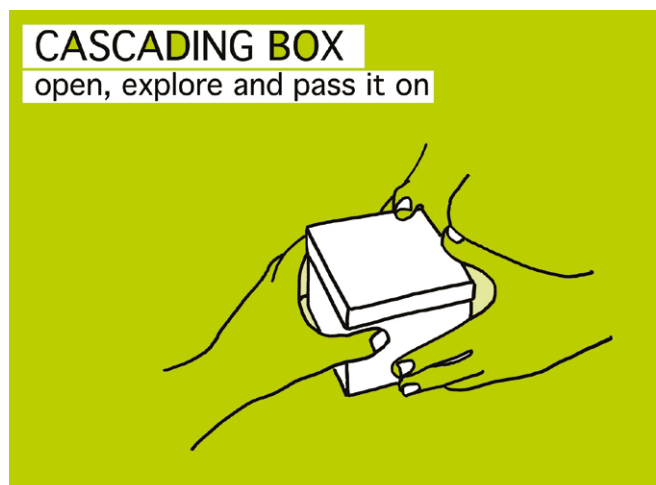
Figure 8
Images from two Scaling-up sub-projects:
media training with young people and workshop
at Flossie event focussing on technologies for
assisted living.

The cross-pollination process generated five different sub-projects. One focussed on community journalism and place, and involved media training to help marginalised people in Sheffield explore and express their relationships with their place. The second project was developed through a partnership with the Citizenship Foundation for developer Lend Lease, and provided media and design training to young people at Sacred Heart Catholic School in Elephant and Castle and an opportunity to explore their place and create ideas for a new open space. The third project used the occasion of Flossie 2013 (a two-day women-only event to open up and diversify technology) to explore ways in which emerging technologies could be integrated into the design of the built environment, with an emphasis on assisted living *(Figure 8)*. The two other projects focussed on exploring the possibility of scaling up co-design by providing socio-material infrastructures that are tailored to specific needs (online funding bidding collaboration for the voluntary sector and collaborative mapping of routes for wheelchair navigation). The projects involved a number of external organisations and individuals who were not originally part of the project and who reported a variety of benefits, from practical skills and confidence to a sense of empowerment and ability to apply and advocate co-design in their own practices.

For more about the Scaling up research see Dearden et al.[57]

57
Dearden, Light, Zamenopoulos, Graham, Plouviez, de Sousa 2014.

4.3 Reflections on the examples

The two examples discussed here show many commonalities and differences, which reveal some of the complexity and diversity of co-design research.

Looking at the politics of co-design, we see that both cases ultimately embrace all three key ideals of empowerment, innovation and sustainability. Yet, they are different in the way they approach those three concepts. For example, in terms of the question of who was involved in the process, the Wards Corner case is essentially a direct collaboration between academics and a grassroots community, while in Scaling up the focus was on collaboration between academics and CSOs. The why (the rationale) and intricacies of inclusivity – exclusivity were also very different. WWC encompasses a large community, which remains open to all people from the locality as well as those who have an interest in democratic, participatory planning. The very objective of the co-design task was to develop ways to include more people in making sense of their situation and envisioning an alternative future reality for the market. Although diverse opinions and views were welcome, the activity did not seek to generate consensus and, in the main, sought to make the voices of the opposition to those in power heard. From the wider WCC community different people took part at different stages and by taking different roles in leading, enabling and organising the process, generating ideas for solutions, realising the media intervention (the 'thing') and evaluating processes and outcomes. In Scaling up, the CSOs acted as gatekeepers who mediated and facilitated interactions and engagement with other partners and members of different communities. Each sub-project comprised a different academic-CSO team, who defined common interests and values and recruited external partners with those interests and values in mind. So there were two levels of co-design, at a 'top' level of the research questions, objectives and methods and at the 'bottom' level of the individual sub-projects. While sub-projects generally respected the top-level principles, each followed a different model of work, with academics, CSOs and communities playing different roles.

There are also notable differences in terms of the mode of participation in research and knowledge production. Although in both cases knowledge was co-produced, in Wards Corner the research questions and objectives were to a certain extent pre-defined by academics, while the Scaling up project was specifically an experiment in academic-community collaboration in research design. Conversely, one can say that in the Wards Corner case, there was a more direct participation of community groups in producing and making knowledge explicit or communicable through the artefacts produced, while in Scaling up, the partner organisations mediated connections with community groups and the 'curation' of knowledge for dissemination by each sub-project team was key.

Both studies, however, produced different types of knowledge as discussed in Section 3.3. This includes knowledge about the research question and object of co-design: the challenges and opportunities associated with creative citizenship and scaling up social innovation; knowledge about the potential futures: the places, technologies, services, and environments that communities wish to create; as well as knowledge about the tools and processes that can support them to do so. In both examples, knowledge was derived by prototyping and testing those alternative realities, but the studies also produced valuable knowledge about the practice of co-design itself: what processes, methods and tools we can use to facilitate co-design and collaboration in knowledge production, and how we can make co-design better. Both the asset mapping and the cross-pollination processes for example have been used consequently in a variety of projects.

The studies produced valuable knowledge about the practice of co-design itself: what processes, methods and tools we can use to facilitate co-design and collaboration in knowledge production, and how we can make co-design better.

5.
SUMMARY AND A WORD ABOUT THE FUTURE

This review provided an overview of co-design as a type of research, starting by explaining the nature of design and co-design in particular. We proposed a view of co-design as a collaborative, cooperative, collective or connective practice in which people make sense of their current situation and envisage potential and desirable futures, as well as specify 'Things' that could create that envisaged reality. As a collaborative/connective practice it also crucially involves identifying who will respond to these questions and in what ways.

We proceeded by discussing the historical roots of co-design and exposing some key approaches and dimensions. Crucial to this exposition was a discussion about the variety of approaches taken with regards to the *politics* (i.e. the overarching ideals, principles and objectives of co-design activity), and *practices* of co-design (i.e. the approaches, methods and tools that are used during co-design). While these notions are not meant to be used in order to classify research (and indeed in the examples offered we saw how different approaches may blend with one other), we find they are useful for anyone wishing to engage in co-design research, both to provide inspiration and understanding of possibilities, and as a reflection tool.

We also discussed the uniqueness of co-design as a type of collaborative research and argued that, although it shares some fundamental principles with participatory action research and pragmatism, it is distinct in its strategy as it aims to develop knowledge abductively. This characterises co-design as a type of research that produces knowledge about the possible existence of a certain future/reality by constructing that reality and exploring its meaning.

Co-design, in our view, has therefore a distinct important contribution to make to knowledge and society more generally. Although there is no way of telling what the future of co-design might be, it seems that we are in a position historically where it is important to think about the future of co-design, not as a unified practice, but as a programme. This means looking beyond the individual approaches, methods and achievements, and beyond individual projects, to examine how to build greater capacity in co-design in society, that is, both within and outside academia and professional practice.

Co-design is a type of research that produces knowledge about the possible existence of a certain future/reality by constructing that reality and exploring its meaning.

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GLOSSARY

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Abduction
A type reasoning in logic also called 'inference to the best explanation'. It is a type of reasoning that starts with an observed or desirable future effect and then proceeds with the construction of an explanation or mechanism for achieving this effect.

Asset mapping
A process of eliciting and creating a map of community assets. Asset mapping facilitates the development of new projects or solutions by building on existing capabilities and resources.

Co-creation
Any process in which different parties come together in order to create a mutually beneficial outcome. In design research and practice, co-creation often refers to the collaboration between experts and non-experts (users) who bring their creativity together to develop a solution.

Co-design
A practice where people collaborate or connect their knowledge, skills and resources in order to carry out a design task.

Design thinking
A term referring to the unique creative strategies, approaches and practices designers use during the process of designing. Because of its generality, design thinking has also been described as a creative strategy and approach to address complex issues that often fall outside the traditional professional design practice, such as in business and social contexts.

Infrastructuring
A term referring to the work of creating socio-technical resources that can be used beyond the initial scope of a design to help build ongoing capacity for community participation in design activity.

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