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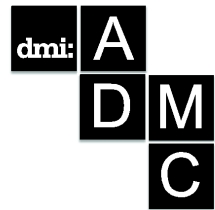
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Innovation Constellations as a systems approach to social design infrastructuring

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There are constant calls for innovation related to complex social challenges. This includes calls to innovate within government and public organisational structures but expands to include unsustainable relationships and behaviours in public life. Design is often positioned as a capability that can offer new approaches and develop novel interventions with the design project as a key mechanism. Through a case study focused on an Innovation Constellation a discussion is developed about an emerging sociomaterial design infrastructuring system. The case study presents a complex system of designing that highlights political infrastructuring as significant in supporting a diverse group to bridge the gap between social justice rhetoric and practical action to intervene and influence existing social circumstances.

Keywords: Innovation Constellations; Social Design; Public Good; Infrastructuring

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Introduction

Many national agendas and the United Nations' Sustainable Development Goals point to the need for innovation and sustainable practices in health, social care and education. Additionally, there are increasing calls for greater understanding about, and application of, design in policy-making, public sector and other complex contexts to support social innovation and sustainable practices (Thorpe, 2019; Malpass & Salinas, 2020 & Whicher, 2020) This research sits within the broad design research landscape related to Social Design (Resnick, 2019) and aligns to specific discourses about Design Things (Ehn, 2008 & Binder et al., 2011) and infrastructuring (Selloni, 2017; Dantec and DiSalvo, 2013; & Spencer & Bailey, 2020). As such, this paper contributes to the discourse about Design for the Public Good.

This paper reports on initial findings from the first two years of collaborative working between a team of multidisciplinary design researchers and a set of organisations that span health, social care and criminal justice. The collaboration responded to the question, "what theories, principles and practices might be influential in designing a social justice constellation and how might they be employed?" To this question an approach based on infrastructuring theory has been applied to enable a set of organisations to engage in design practices to explore how they might re-conceptualise the resources and expertise of their organisations and the communities they work with to offer a fundamentally better and fairer system for health and care. This paper presents a case study that charts the creative practices and outcomes as the group attempted to sense-make their roles, responsibilities, agency, and potential. Focused on participants and their interactions, activities and initiatives a thematic analysis is used to develop a conceptualisation of an Innovation Constellation.

There are very few empirical studies of infrastructuring across organisations and this research is significant in addressing that gap. It highlights the importance of sociomaterial environments that support a heterogeneous group to share in new ways to develop a political discourse about which 'objects of design' should be engaged with. This understanding is of potential value and interest to those engaging in design for public good research and practice.

Literature Review

Calls for social innovation, innovation in the public sector and innovative public goods are not new. Murray, Caulier-Grice and Mulgan (2010) claimed that social innovation was critical for addressing social problems. According to those authors, raising costs of delivery make current models and practices unsustainable; the classic tools of government and market solutions have proven inadequate for addressing social challenges; and existing structures and institutions maintain control and resist innovation as opposed to nurturing it. Tucker (2014) furthered the discussion in the assessment that; distributed systems are required where innovation and initiatives are developed 'with' and 'by' users and dispersed to the periphery and connected by networks. More recently the OECD (2020) cautioned that in the current context of unprecedented volatility, uncertainty, complexity and ambiguity a more sophisticated systematic approach to social challenges and sustainable development is needed. Has design knowledge and practice matured sufficiently to offer perspectives about and practice to support a 'more sophisticated systemic approach' to effectively engage with and transform complex sociomaterial and sociotechnical situations?

There are significant discourses relating to the conceptualisation and performance of design in these types of complex contexts. In this paper it is not possible to sufficiently review them all. However, there is knowledge related to social design (Resnick, 2019) and transition design (Irwin, 2019) that will be presented to support this paper's case study report. According to Armstrong, Bailey, Julier and Kimbell (2014), social design uses 'participatory approaches to

researching, generating and realising new ways to make change happen towards collective and social ends, rather than predominantly commercial objectives’ (ibid., p.26). Tonkinwise (2019) produced a schema (refer to Table 1.) for different understandings of the ‘social’ in social design. Paraphrasing, he concludes that: social designing is political; through significant sociotechnical innovations it can respond to unmet needs to afford significant social change.

Table 1 Schema for ‘Social Design =’, adapted from Tonkinwise (2019).

[1] Designing as a social activity	[2] Design works with the sociomaterial	[3] All innovation is sociotechnical	[4] Design of systems with significant social media aspects	[5] Social science based projects conducted as/with/by designers
[6] Design of/for services	[7] Designing for/of governments	[8] Designing for/with non-commercial contexts	[9] Design in the context of unmet needs	[10] Design-enabled social change

An alternative schema for what social design is and should be (Refer to Table 2.) was presented at a recent conference workshop, by members of the Social Design Institute at the University of the Arts London (Bailey, Kasynska, Kimbell and Nold, 2021). They highlight that ambiguity about what is meant by ‘social’ is holding social design back. This, they state, is a problem of scale as social design can be both, or either, intimate participatory practices and the institutional structures and sociology of societies. This set of principles are positioned as a means to enhance the discourse about how to engage meaningfully with the tensions of sociomaterial rhetoric and mundane institutional practices.

Table 2 12 Principles of Social Design, adapted from Bailey et al. (2021).

THE SOCIAL HAS AN OBJECT OF DESIGN	METHODS AND PRACTICES	NORMATIVE INTENT	CRITICAL REFLEXIVITY
Social Design claims there is a distinct ‘social’ that is made through and with things	Social Design is an anticipatory sociomaterial practice that proceeds through intervening into and reconfiguring sites and worlds	Social Design is underpinned by normative intentions and undertaken with a view to creating social transformation	Social Design problematises the traditional modes and historical achievements of professional design, its Eurocentric assumptions, and its racialised and unequal consequences.
Social Design acknowledges that there are many possible ways of operating on the social	Social Design engages multiple perspectives, knowledges, and disciplines: no single one has a privileged methodology for operating on the social	Social Design forms issue-publics by creating shared, open-ended endeavours with communities through collective discussion about purposes, needs, values, and consequences	Social Design tries to mitigate against the unintended and damaging outcomes of designing.
Social Design claims a hybrid space of social practice between technical systems and human-centred design	Social Design shifts and translates across object and planetary scales, domains and sites	Social Design builds new forms of democratic relations between places, living beings and things	Social Design is critically aware of its political, systemic, institutional and environmental situatedness

Further consideration of the Social Design principles under ‘Normative Intent’ raises some important questions that support a critical consideration of this study’s case. Ehn (2008) presents Design Things as an important conceptualisation of design. Design Things are dynamic social-material environments which enable a shared object of concern to be engaged with as an object of design gathering together issue-publics. Ehn, challenges the boundaries of the traditional design project and how it is constructed, developing a position that creating platforms or infrastructures to help constructively deal with disagreements about sociotechnical futures amongst heterogeneous groups where no current social community exists, is one of the ultimate challenges

for professional design. Malpass and Salinas (2020) in the AHRC Challenges of the Future: Public Services report highlighted design's ability to assemble publics constituted of diverse stakeholders to address public service challenges. This infrastructuring, that assembles publics and transfers knowhow, broadens the view of what might be considered innovation as a process of 'aligning the interests of a range of stakeholders through a design research process' or as Ehn (2008) may urge us to consider, infrastructuring to constructively deal with disagreements and mis-alignments. Malpass and Salinas, through their review identified three types of infrastructuring activities that emerge from work undertaken in the design for public services field:

1. Relational infrastructuring - these are activities that create shared trust and value aimed at building relationships between the range of actors within a project.
2. Operational infrastructuring - these are activities that develop and build capacity and where participation within the process develops knowledge and resources within the actor network.
3. Strategic infrastructuring - these are practices of participation that break institutional silos, align agendas and create space for future innovation resulting from interactions in the design process.

These forms of infrastructuring when considered within a sociomaterial perspective that acknowledges both human and non-human participants (Bruno Latour's work and Actor-Network Theory is often cited in design research in this context) may support the Social Design principle: builds new forms of democratic relations between places, living beings and things. While these forms of infrastructuring are recognised, there is, however, little understanding about them as sustainable social supports.

Irwin (2019, pp., 149-181) suggest that there are particular perspectives and approaches involved as design is applied to contribute to systems-level change in our societies to effect a transition from one kind of society to another. Transition Design or "design for transition" brings together two powerful memes: the idea that entire societies will need to transition toward sustainable futures and the realisation that this will involve systems-level change informed by a deep understanding of the anatomy and dynamics of complex systems. The transition design framework outlines four mutually reinforcing and co-evolving areas of knowledge, action, and self-reflection:

1. The important role that long-term visioning plays in societal transitions
2. The role of Transition Design in building social capacity and establishing a new social infrastructure
3. Ecological literacy as the basis for a Transition Design approach
4. A framework or "palette of practices" that can be configured in situation- and place-specific ways & the cultivation of system leadership.

Two mechanisms act in a Transition Design approach - the transition design process and the transition pathway. Set to resolve a wicked problem or shift a sociotechnical system the transition design process of 're-frame the present and future', 'designing interventions', and 'waiting and observing' is iterative and extended over years or even decades. The transition pathway co-creates long-term visions, based on re-framing practices, as a "compass" from which medium-term visions are backcast acting as targets and goals for ecologies of projects that are the transition steps. Irwin (2019, pp. 172-173) presents two strategies for Transition Design: firstly, linking projects and interventions to create ecologies of interventions to seed systems level change, and secondly, amplifying grassroots efforts as sensitive and responsive to emergent

solutions. This second strategy relates to Manzini's argument (2015) that an important role for professional designers is to recognise where communities have achieved alternative more sustainable social relationships and to develop the means to transform these social innovations for other contexts. 'Waiting and observing' is extremely important and a key differentiator in the approach. According to Irwin (2019), designing solutions is an error of conceptualisation. The responses of a system cannot be predicted therefore transition designers have a practice of 'solutioning' and this requires periods of activity and intervention and periods of observation and reflection.

What forms of issue-publics and sociomaterial environments support the characteristics required by a transition design approach? This paper's case study begins to address this question by presenting an infrastructuring system across organisations that attempts to develop and support a new locally rooted design-led innovation capability to enhance social justice.

Methodology

This work adopts a methodology consistent with the principles and practices of an instrumental single-case study (Stake, 1995; Flyvbjerg, 2013). It focuses on participant interactions, activities and initiatives within a particular set of circumstances and conditions to understand the complexity of a sociomaterial design environment as it unfolded over time. The case study does not assess the effectiveness of facilitated or co-creative events. The case study is based on data gathered over the period Sept 2020-April 2022 and examines the unfolding and still-in-progress attempt to develop a new locally rooted design-led innovation capability to enhance social justice. The data materials used in this research include documented events, gatherings and meetings, digital and physical workshop materials, participant reflective commentaries, funding bids, emails, researcher notebooks. The case study report is presented through three parts: *Overview*, *Beginnings* and *Continuing*.

The *Overview* section gives details of the intent that initiated this investigation; the participants and organisations that have engaged, continued or left; the projects and activities undertaken; and the infrastructuring that has developed. The *Beginnings* section covers a period from June 2021-October 2021 and focuses on the initial period of participation and reflection. The group came together to explore and express the possibilities for innovation and supporting social justice and this section of the case study describes the sociomaterial environment; its participants and their interactions as facilitated talks, workshop activities and discussions. The *Continuing* section covers October 2021-April 2022 and reports on the developing and emerging infrastructuring as experimentation, events, initiatives, and informal meet-ups. The case study report is then discussed to produce a conceptualisation of an Innovation Constellation which is argued to be a systems level sociomaterial approach for social design infrastructuring.

There are 4 researchers who have contributed to the analysis and production of this case study, each has a different relationship to the Innovation Constellation. This has allowed rich descriptions of the case to be developed. However, the authors are very aware that there are many different standpoints and participant perspectives that are not included within this case study, which is an inherent limitation and focus for further study. The relationships that the authors have with the situation the case study reports on are:

- Associate Professor of Design Innovation: initiator and university lead for the constellation
- Senior Research Associate (Oct 2021-present) & member of Master's cohort 20/21: involved continuously since June 2021 and originator of the supporting hyper-local constellation
- Senior Research Fellow: observer at constellation events June 21-April 22

- Associate Professor of Design Innovation: involved in the constellation by coaching Masters student cohorts as they engaged. No participation in constellation events
- Doctoral Researcher in Design Innovation: no involvement with constellation events or initiatives.

Case Study: An Innovation Constellation

OVERVIEW

Investigating new forms of locally rooted design-led innovation capability to enhance social justice in the development and delivery of public goods helps to bound this case. That focus has been developed over the course of the last decade. During this period a team of researchers has investigated responsive-responsible design innovation in multidisciplinary contexts with over 75 regional, national and international organisations across various sectors. This research engages with the complexities of transition; the conflicting views and influence of different people and organisations and their collective roles in realising fairer, responsible and more rewarding futures. Through a practice-based approach their research explores how capabilities can be developed that initiate desirable transitions and help non-design experts to continue an appropriate design practice within their professional or community setting. Some of the practice and knowledge that supports this inquiry developed by the research team relates to transforming wicked problems into design situations (Bailey et al., 2019), leveraging slow design practice in commercial contexts (Hemstock & Spencer, 2019), social value creation through multidisciplinary design education (Kyffin, Aftab & Spencer, 2019), navigating ‘matters of concern’ (Spencer & Bailey, 2020), and design facilitation practices (Carrion-Weiss, Bailey & Spencer, 2021). To extend this knowledge, contribute to the research field and act meaningfully in our region, the research team sought to develop understanding about prototyping social design orientated sociomaterial environments. Specifically, the research hoped to better understand the influencing conditions for political and practical discourses about innovation and social justice and the influence that design knowledge, practices and acts exert on existing and new social dynamics. The first step taken in this long-term inquiry was to establish a collection of leaders from across a range of different organisations concerned with social justice and innovation and to facilitate a productive dialogue through design innovation practices.

Pragmatism was applied to form a working set of organisations based on active relationships. All the organisations were delivering services that can be understood as a public good and are interested in innovation (how they operate and how they might better recognise and meet need). Table 3. presents all of the organisations and actors directly engaged. Organisations A-J are original members and K-O associated members through involvement in a hyper-local design for social justice project “Difficult Transitions”. The initial invitation was to join a constellation of organisations to learn from each other and to explore meaningful collaboration opportunities through 6 x 2-hour facilitated online sessions (across a 3-month period).

Representatives from these organisations (whom from here on in will be referred to as ‘actors’), following a video call to discuss collaboration opportunities, were invited via email to join the constellation as a community of ‘experts’ with different perspectives on supporting marginalised or vulnerable people to learn from each other and identify integrated innovation opportunities. The intent was that this community would form a different kind of issue-publics, engaging in a broader discourse than is possible when focussed on a single set of stakeholders or sectoral issues. By coming together in a supportive and facilitated manner the intention was to:

- a) Act as a critical peer group to discuss challenges associated with leading innovation and positive change.

- b) Explore integrated innovation opportunities to address social injustices recognised in their individual contexts.
- c) Explore how the University can become more accessible, a better collaborator when exploring themes of social justice and more effective contributor to social innovation.

To develop and stimulate the work conducted by and through this initial Innovation Constellation a team of 6 Multidisciplinary Innovation Masters students (MDI) joined the constellation. For these students this work was the focus of their dissertation project which responded to the challenge: ‘what results when a collection of organisations are stimulated with design thinking that responds to the dynamics of individual needs, organisational constraints, changing conditions and persistent challenges’ and ‘what platforms, tools and activities most effectively support an Innovation Constellation to collaborate effectively?’

Table 3 Innovation Constellation Organisations and Actors.

Code	Type of organisation	Network Actors	Notes
A	Large civic university	A1 Associate Professor of Design Innovation (P-A) A2 Senior Lecturer, Criminology and Criminal Justice A3 Senior Lecturer, Multidisciplinary Innovation A4 Senior Research Assistant (P-A) A5 Masters Students 20/21 (#6) A6 Masters Students 20/22 (#8) A7 Associate Professor of Design Innovation (P-A) A8 Senior Lecturer, Entrepreneurship A9 Senior Research Fellow (P-A) (P-A = Participant-Author)	A1 Convened the constellation and took a lead role in hosting the sessions. A2 made valuable introductions to Actors who joined the constellation, but beyond this didn't engage in sessions. A3, A7, and A8 supported the Masters students (A5 and A6) during the Social Justice projects, but didn't attend many sessions with the constellation. A4 was part of the A5 student group and continued to engage with constellation activities in their research position after graduating. A5 students worked with Organisation G on a short project in their first semester and then with the constellation on a 2 month dissertation project. A6 students were supported by Organisations B, E, F, G and H during their semester 1 Difficult Transitions project and K-O during their hyper-local semester 2 Difficult Transitions project. A8 supported students A5 and A6 as tutor during their projects and A9 observed some constellation events.
B	Large regional prisons group	B1 Group Director B1.1 New Group Director B2 Covid Recovery and Diversity and Inclusion	Referred (via A2). Never collaborated with designers to support their reform agenda. Covid restrictions evidenced valuable creative responses to prison organisation that enhanced prisoners' outcomes. Interested to explore how to better embed innovation strategically and be part of a broader discussion about social justice.
C	Regional Police Force	C1 Problem Solving Partnerships Manager	Referred (via A2). Interested in innovative approaches to crime prevention that might emerge from combining different perspectives. Currently, the SARA (REF) model is used as a primary principle for problem solving.
D	Police, Crime and Victims' Commissioner's Office	D1 Policy Commissioning and Accountability Lead	Referred (via A2). Believe most innovation opportunities reside in the 'crime' rather than 'policing' space. They are very familiar with complicated partnerships working to deliver all aspects of criminal justice. They are responsible for the Force's commissioning and policy development.
E	National Health Service (NHS) Foundation Trust	E1 Trust Lead for Strategy and Sustainability E2 Director of Research and Innovation	Referred (via A2). Greatest experience relates to innovation in clinical healthcare. Interested to explore ideas for integrated social and health care in the context of community

			transformations. E2 had prior experience of academic research and collaboration.
F	Regional Mental Health Charity & Local investment partnership supporting social enterprises	F1 Chief Executive Officer (for both organisations)	Towards the completion of their PhD, referred (via A1) as part of an ongoing dialogue about structurally embedding Design Thinking within their organisations as a capability to probe and foreground discussions about long-term inequalities in a specific local area.
G	Large Charity supporting elderly religious communities, people who have been victims of modern-day slavery, who are homeless or with physical and mental disabilities (National)	G1 Chief Executive Officer G2 Director of Opportunities G3 Service Designer	Referred (via A1), contacted the university interested in collaborating on a design-led innovation student project exploring how to enhance their existing services for people who are homeless or subject to modern day slavery. G2 had previously worked in academia. Interested in applying design thinking to support their strategy related to becoming an entrepreneurial charity.
H	Community Consultant	H1 Independent Community consultant	Referred (via F1) working closely with the Local investment partnership supporting social enterprises (F) and already working to develop cross-sector partnership working to address social and health challenges in a specific local area.
I	Large Regional Housing Association	I1 Service Designer I2 Design Researcher	Referred (via A1), I1 is an alumnus of the Multidisciplinary Innovation Masters course.
J	Large Regional Housing Association	J1 Innovation Manager	Referred (via I1). New in this role. Previous experience of service design within a mental health charity.
K	Regional charity supporting people who are refugees or are homeless	K1 Wellbeing Programme Coordinator K2 Hostel Manager	Referred (via A4), K1 has an architectural design background and was already using design-led approaches to co-creating activities for their service users.
L	Local social enterprise	L1 Founding Director	Referred (via A4), already a very entrepreneurial organisation keen to collaborate with the university having had several successful academic collaborations in the past.
M	Community Café	M1 Head Volunteer M2 Volunteer	Referred (via A6)
O	Other organisations	Various Roles	Other organisations who contributed or engaged with Innovation Constellation activities on a temporary or short-term basis.

FOUNDATIONS (JUNE-OCTOBER 2021)

Six 2-hour online sessions shaped the constellation’s initial engagements; MS Teams was used to host the group video calls and Miro was used as a concurrent digital working space. Across this period the MDI students worked full time on the project supported by 4 experienced academic coaches. The invitation was clear that attendance was voluntary and that giving apologies or leaving the constellation part way through was perfectly fine. The following sessions helped to meet the constellation invitation’s objectives:

June 4th 2021. Attendance: (A1, A2, A5, A9) (B1, B2) (C1) (D1) (E1, E2) (F1) (G1, G2) (H1) (I1). All participants introduced themselves with descriptions of innovation in their professional context and their reason for joining the constellation. A talk was given to position *design in the expanded field* (Dorst, 2015), the constellation as a sociomaterial *Design Thing* (Binder et al., 2011), and innovation projects within and across constellation organisations as a means to explore the tensions and controversies encountered when attempting to implement social justice oriented change (Spencer & Bailey, 2020).

June 18th 2021. Attendance: (A1, A2, A5, A9) (B2) (C1) (D1) (E1) (F1) (G1, G2) (H1) (I1) (J1). Following a series of well-being exercises the group worked collectively mapping out the core needs of different groups that each organisation aimed to meet. Planned as conversation starters, and adapting determinants of health and pathways to reduce re-offending models, the mapping sought to spark discussion about commonality and difference, challenges and inequalities. Interaction was transactional with participants each contributing in-turn. Dialogue across members was challenging to encourage with the session’s open-ended structure.

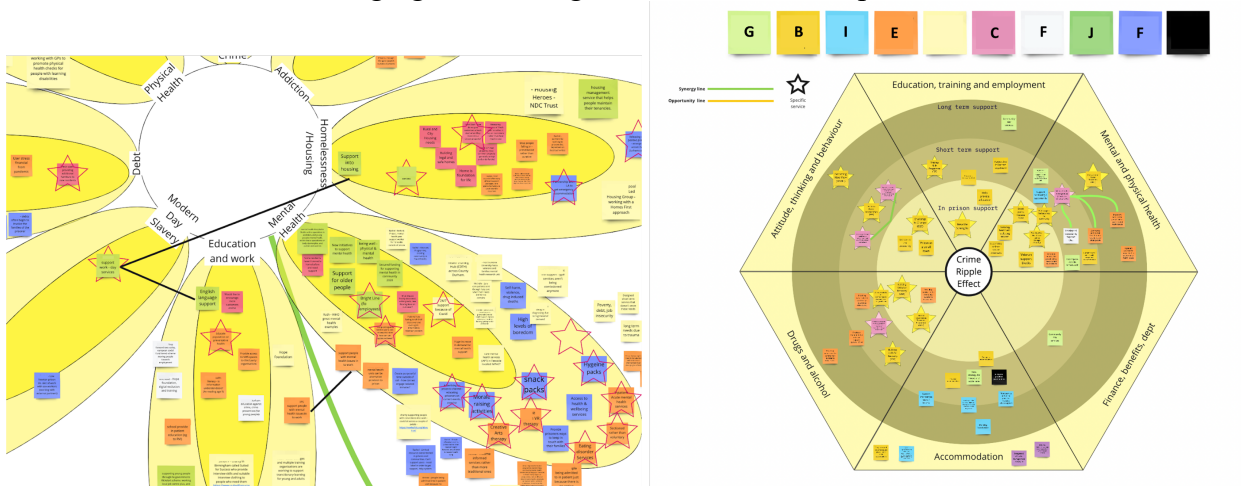


Figure 1 Materials developed during June 18th Constellation Session

July 2nd 2021. Attendance: (A1, A2, A5, A9) (B2) (D1) (E1) (F1) (G1) (H1) (I1, I2). This third session aimed to co-develop visions for the future and discuss the type of structures, policies, ideas and behaviours that makes them difficult to achieve. The following three questions previously developed were considered in the context of the ideas emerging in the session: why is distress experienced as a result of navigating current support services; what roles within an innovation process could be formalised for people with lived experience of these services; how do invisible systems of care in communities interact with or respond to formal care systems? Frustrations were raised because ‘seeing’ what actions were needed to move towards these fairer futures was not obvious. This afforded a discussion about the actions and initiatives that can be made now as an individual or through their organisations.

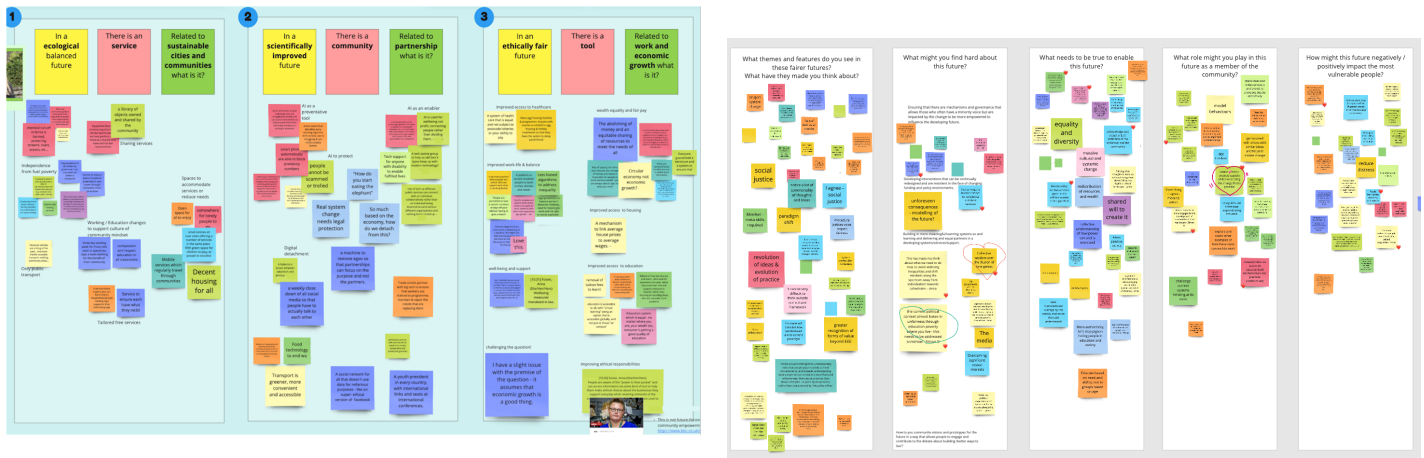


Figure 2 Materials developed during July 2nd Constellation Session

July 16th 2021. Attendance: (A1, A2, A5, A9) (B1, B2) (C1) (D1) (E1, E2) (F1) (G1, G2, G3) (H1) (I1). A presentation about models and methods to develop and prototype ideas setup co-creative speculation. An ideation model was used to encourage participants to put forward ideas for how our themes of interest might be actioned and what could exist or might need to exist to support this.

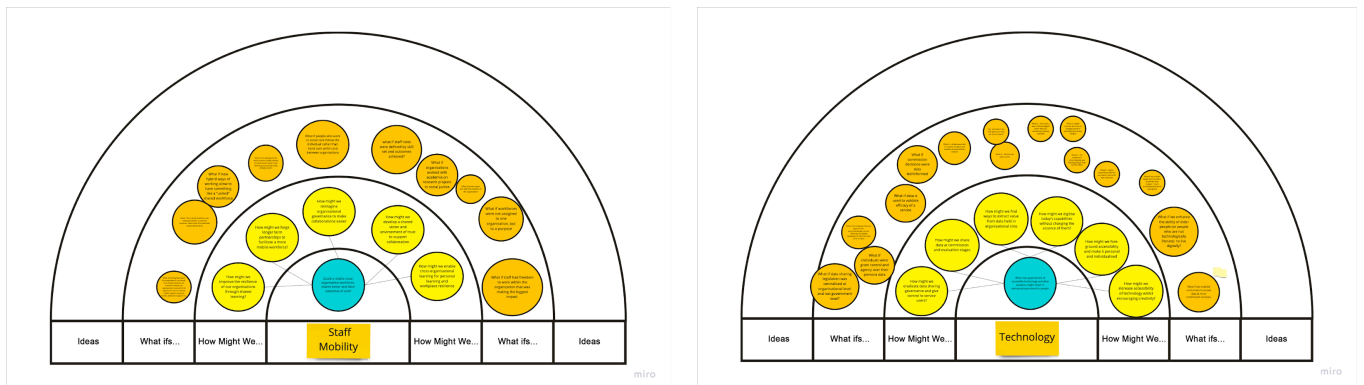


Figure 3 Examples of speculatively probing fairer futures, via emerging themes July 5th 2021

July 30th 2021. Attendance: (A1, A2, A5, A9) (B1, B2) (D1) (E1, E2) (F1) (G1, G2, G3) (H1) (I1, I2) Marking the end of the MDI students' involvement this session was a reflective discussion about their findings and the experience of participation. Each member had the opportunity to state what had worked and resonated with them and what had not.

September 10th 2021. Attendance: (A1, A2, A5, A9) (B1, B2) (D1) (E1, E2) (F1) (G1, G2, G3) (H1) (I1) Reflections and actions - reviewing the value and mechanisms supporting the Innovation Constellation and discussing opportunities that emerged through previous sessions and how we might progress them.

Following this group session A1 held separate video calls with each organisation to talk about future engagements with the constellation. These discussions led to the development of the Innovation Constellation Framework and a new phase continuing the infrastructuring. Outside of the planned constellation sessions, in June 2021, two of the MDI students joined Organisation I in the role of creative practitioners at one of their staff-based innovation challenge workshops. This was a good illustration of sharing human resource and talent across constellation members (even if a very limited one). In July 2021 Organisation G led and submitted to the National Lottery Community Fund - Growing Great Ideas. The bid, which was ultimately unsuccessful,

focused on experimenting with accessible technologies to meet unmet needs of people with learning disabilities. Establishing a set of interconnected innovation constellations was a central mechanism in the proposal for developing and prototyping ideas, learning from that material to understand how current inequalities were being maintained and to challenge and act on that to create fairer and fitter social care systems. Together this system was positioned to be a community of change.

CONTINUING (OCTOBER 2021-APRIL 2022).

Galvanising the emerging structure of the constellation, early in the continuing phase a framework was shared with constellation members which described: the aim of the constellation; the types of projects that were supported by the constellation; a set of objectives for the coming year and longer-term ambitions; a suggested schedule of interactions; the core values constellation members agree to work to; and current membership of the constellation. The constellation aim was to:

bring to life new interventions that strengthen communities and empower people to face and address their difficulties. The constellation provides the scaffolding for systems-level learning and applied change through action research and collaboration across organisational boundaries, drawing on diverse sources of knowledge, experience and capabilities to achieve its aim (Innovation Constellation Framework, Oct 2021).

Within the framework three types of projects were framed: Short-term projects developing alternative approaches or new solutions to existing problems; Medium-term projects exploring a complex situation, re-framing challenges and opportunities from different perspectives and developing interventions aimed at positive change; and Long-term projects developing greater independence and resilience for individuals and the communities in a place (physical and/or digital). In the framework the value for different constituents for each project type was described. The framework provided a schedule of gatherings planned for the year; formal quarterly constellation-wide meetings interspersed with in-formal monthly constellation coffee gatherings. Members were invited to self-organise into smaller group to discuss specific themes and action projects.

Table 4 Innovation Constellation Core Events Nov21-April22

November Constellation Coffee (26/11/2021)	Held online. A6 (MDI students) gave an overview of their Difficult Transitions project and constellation members were invited to review the opportunity spaces that have been identified and help to shape the second phase of the project.
December Constellation Coffee (17/12/2021)	Held online. Attended by: A1, B1, B2, C1, E2, F1, G2, H1 Discussed: Prisons Group innovation project idea and a Youth Futures funding bid
February Core Constellation Meeting (04/02/2022)	Hosted by Organisation G at their offices Attended in person by A1, A4, G1-3, H, Attended online by A3, A9 & B1 Main focus: An internally funded innovation programme to support staff to develop ideas to enhance the charity (G) and its mission.
February Constellation Coffee (18/02/2022)	Held online. Attended by: A1, B1, C1, F1, G2, G3, A9, A4, A6 Discussed: A6 opened conversations about the challenges people face while living in uncertainty and volatility.
March Constellation Coffee (18/03/2022)	Held online. Attended by: A1, B1, B1.1, F1, G3, Discussed: B1 retiring and his insights into the value and how to enhance the constellation. Welcoming B1.1 as B1's replacement. G3 presented the ideas that have been successful through

	<p>their internal staff innovation programme and why they have been deemed valuable. A1 talked about the workshop he was about to join where he was co-leading a co-designing a social housing letting experience.</p>
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In this period a range of outcomes emerged as small groups of constellation actors developed new initiatives. Examples include:

In October 2021 Organisation G committed to funding and supporting a Collaborative Doctoral Study. The outline of the application was developed by A1, A4 and G2 and aims to establish new understanding about sustainable infrastructuring within a user-centred entrepreneurial charity.

In November 2021, Actors F1 and H1 invited A1 and A4 to run an in-person session for a new mental health alliance helping them look beyond individual problem solving to identify new ways distribute systems of support within and across communities.

In February 2022, Actors F1 and H1 invited A1 and A4 to contribute to a joint funding bid. The bid had already been supported by B2 who had leveraged their professional network for further input. The bid proposed a new youth employment partnership (including a college, police force, youth justice group, local authority and voluntary sector) to work alongside young people to research (stage 1) and then address (stage 2) solutions to the problem of systemic negative and bias mindset in young people which limits their thinking and creates boundaries for opportunities and growth. The outcome of this funding bid is awaited.

In March 2022, Organisation G ran a two-day innovation residential for 8 of their staff, introducing them to design-thinking and coaching them through the process of developing concepts which could be prototyped to improve or extend support for their service users. A4 joined at the beginning of the residential to support exercises in creative thinking and at the end as part of a panel (which included G1-3) to judge the concepts which the individuals had developed and pitched.

Between December 2021 and March 2022 a funded collaborative research project was developed and approved. In the context of prison reform, the research centres on developing a strategy to construct effective and sustainable ‘structured on wing activities’ suitable to meet the different needs of prisoners at their different sites and to reduce violence between prisoners and self-harm. The research which will be delivered in July 2022 utilises human creativity and expertise from across the prison group (Org B) and the innovation constellation in a distributed participatory design practice.

Resulting from the discussions with each constellation member in September 2021 were three themes that covered current interests across the organisations. The themes were, the difficulties that people experience; a) while moving towards adulthood, b) in establishing a sense of home and c) in establishing and maintaining mental health confidence. The cohort of 2021/22 MDI Masters students were given a design innovation brief that they would engage with in three phases during their one-year programme. The brief required the students to locate their enquiry within a specific location, a predefined square 1KM (an urban location based near the university campus). During this work a hyper-local innovation constellation was established drawn from socially oriented organisations in the square KM (K, L, & M described in Table 3.). The practices and themes of the work are supported by discrete constellations and connect and extend an on-going discourse about enhancing social justice and social good.

Discussion of the Case Study

The original intent for the innovation constellation was to bring a collection of socially-orientated organisations together to support each other in their innovation efforts and to actively explore opportunities to collaborate to enhance social justice in their region. The following

discussion uses this case study to consider the following question which is developed from the literature review presented earlier: (1) how do the social design aspects (Tonkinwise, 2019) and social design principles (Bailey et al., 2021) related to normative intent manifest in this case? This discussion is then extended with a consideration of Complex Responsive Processes Theory to speculate about the temporal qualities of different layers of infrastructuring.

A consideration of Tonkinwise's schema of 'social' in social design can help position the 'social' in this case. This case study clearly describes designing as social activity, working with the sociomaterial, concerned with the sociotechnical, integrating non-commercial contexts and debating unmet needs and how they might be better understood. These forms of activity are intended to support design-enabled social change. The case has not evidenced design for services, although the projects that are now emerging will. The case is not design for governments; however, it is working with public bodies in addition to non-government organisations. The outcomes the constellation has produced so far are not social science based projects and are better understood as 'design in the expanded field' or 'design for complex situations' projects. The case study is about the emergence of a system rather than design of a system and it does not contain a social media aspect.

This case study was initiated with an invitation to participate; to form a critical peer group to support each participant's efforts aimed at positive change (framed as innovation) and to collectively explore systems change possibilities that might enhance social justice. This normative intention has developed into a series of discourses related to: the values we aspire and hold each other to in our interrelating and interventions (the culture of our issue-publics); the contextual dynamics of social injustices and the consequences of influencing them (the objects of design); and how we can engage and act together to learn and influence structures and systems for positive change (creatively exploring how to act with imaginative use of resources). The case study has contained a number of distinct issue-publics. Individual actors engaged with the constellation have been active in multiple interfacing issue-publics affording the possibility to share and connect. Some of the case's issue-publics had shared open-ended endeavours (e.g., the constellation of organisations and the Mental Health Alliance) others were time-bound issue-publics with specific outcomes that were being aimed for (e.g., MDI Masters students). The creation of issue-publics is well discussed in the design research literature; it is interesting how this case study begins to demonstrate how different social design issue-publics can interact and support one another in different ways. In fact, the case demonstrates the emergence of a system that initiates and connects issue-publics (with differing scales, scope and duration). Each of these issue-publics is constructed in and develops a sociomaterial environment. This case highlights the importance of sharing across issue-publics of both people and materials as a means to enhance the discourses of those groups and to gather greater resources and capabilities to deal with a particular matter of concern. This is significant because infrastructuring these issue-publics is not merely the forming discrete sociomaterial environments but involves the negotiations, permissions, invitations, roles and mechanisms that support effective coming together and sharing across multiple distinct issue-publics. This interfacing between issue-publics is a central feature in the case study; to create a system that supports a commitment to transitions leading to fairer and sustainable futures. The emerging systems that the case study demonstrates can be understood as constructed through three different types of things: discourses, interventions and encounters.

Different issue-publics are formed by engaging with/as those types of things. For example, in the case study the constellation issue-publics were part of constructing and developing discourses. During June-September the MDI students (20/21) were their own issue-public and also part of the constellation issue-public. However, the MDI students were progressing an action research project, employing design innovation practices and design theory to conceptualise the

constellation and initiate a design for social justice journey. This they achieved by engaging through a series of encounters as part of the constellation issue-public to develop discourses. One of the outcomes of that development are identified ‘Objects of Design’ which can initiate new action research projects, forming new issue-publics, developed through a set of encounters, which feeds into the discourses about their matters of concern. Figure 5., provides a visualisation of these elements and their interactions.

This case offers an alternative understanding of different forms of infrastructuring to that presented by Malpass and Salinas (2020), who described relational, operational and strategic infrastructuring. Each of those forms of infrastructuring can be recognised in the case study. For example, there were activities that created shared trust and value which aimed at building relationships between the range of actors within a project (relational). This can be seen clearly in the Beginning stage of the case and which in Continuing the Constellation Coffee encounters maintain. Malpass and Salinas anchor infrastructuring to activities. However, Ehn, (2008) and Binder et al., (2011) were more expansive, associating infrastructuring with the sociomaterial environment (a Design Thing) that supports the exploration of an ‘object of design’ that produces representatives of that object through different ‘design games’. The authors argue that this case study illustrates forms of relational, operational and strategic infrastructuring and infrastructuring that develops and orientates issue-publics around an understanding of an ‘object of design’: this, we contend, is a form of political infrastructuring.

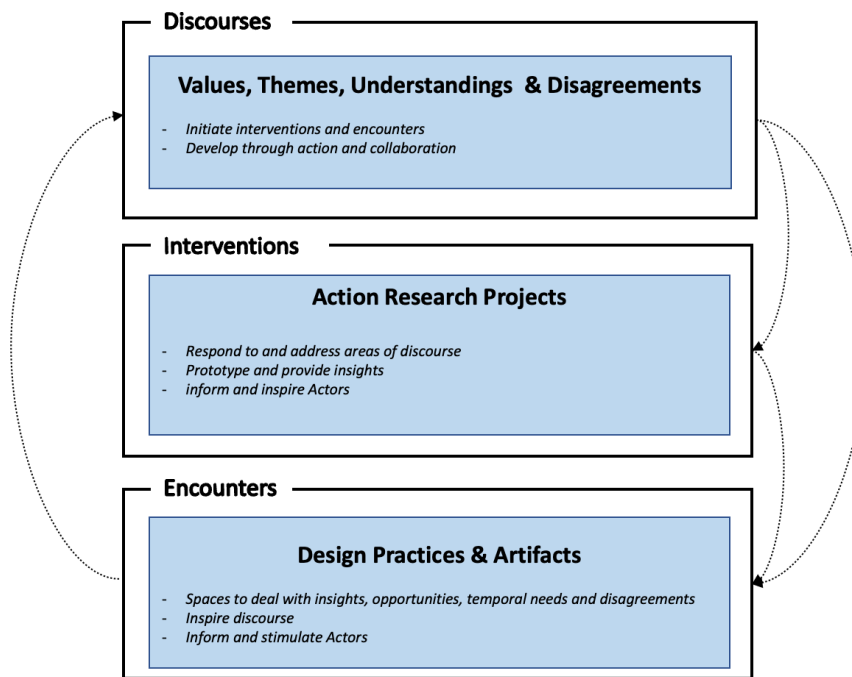


Figure 5 The emerging elements of infrastructuring that support the Innovation Constellation

An innovation constellation is a complex sociomaterial system. As complex responsive processes theory (Stacey, 2003) suggests this is a dynamic environment highly influenced by: the ability and willingness of participants to perceive and respond to each other; the degree to which individuals make public their differences rather than conceal them; and the ability and willingness of people participating to create and articulate novel associations. van der Bijl-Brouwer (2017) suggested that complex social systems cannot be designed in themselves, because they involve humans who have volition and agency, and that we can only design interventions that influence the behaviour of the system. If you can design interventions, you can also prototype arrangements of interventions. The authors argue that this case presents an

emerging prototype of a new social system; a system of structures, interventions and encounters for exploring how we might develop participatory practice using design orientated towards social justice. Perhaps, the prototype is complete once the willingness and capacity of individuals to continue to engage with each other and the themes of their discourse are no longer returning sufficient return to sustain. However, that is the subject for further research, which will systematically consider how an innovation constellation might support the systems listening advocated by the transition design approach.

Conclusion

This paper examined some of the different aspects and principles that define social design. It highlighted the lack of understanding about how social design theories and principles manifest in complex settings and how infrastructuring emerges over time through engagements and contributions from a collections of issue-publics. By considering Transition Design and Social Design literature the question was posed: what forms of issue-publics and sociomaterial environments support the characteristics required by a transition design approach?

An instrumental case study has been presented that focused on an Innovation Constellation: gatherings of different issue-publics concerned with enhancing social justice in their professional context and more broadly in their region.

The case study and its discussion offer two contributions: (1) political infrastructuring is recognised as complimentary to the existing categories of relational, operational and strategic infrastructuring and offers a means to identify ‘objects of design’ from the complex situations where matters of concern reside; (2) a conceptualisation of an Innovation Constellation as a responsive systems approach to social design infrastructuring, which offers organisations a means to collaborative bridge the gap between social design rhetoric and practical action in existing contested social circumstances.

There are numerous limitations to this research. This is a live piece of work and this study is an initial attempt to grapple with the complexity at play as a reflexive act. Further research will:

- Produce a detailed account of the constellation from the multiple perspectives of its participants with an analysis to better understand political infrastructuring.
- Develop an analysis of the emerging social justice narratives through the different lenses of discourses, action research projects and encounters.
- Explore infrastructuring that supports the agency, leadership and contribution of those subject to current social injustices in the contexts of locally rooted systems of change.

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