European Commission

WHAT NEXT FOR DIGITAL SOCIAL INNOVATION?

Realising the potential of people and technology to tackle social challenges

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May 2017

DIGITAL SOCIAL INNOVATION

Contract no. 688192

ISBN: 978-1-84875-160-6

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WHAT NEXT FOR DIGITAL SOCIAL INNOVATION?

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FOREWORDS

This report documents the fascinating explosion of innovations that are making use of digital tools to rethink how we run everything from health and money, to democracy, to refugee integration. It paints an optimistic picture of creativity in the face of social challenges.

But it also shows the barriers which stand in the way of digital social innovation (DSI) achieving its full potential. Europe's governments and public sector are still harvesting only a tiny fraction of the possibilities of these fields, thanks to inflexible approaches to procurement and lack of engagement. Europe depends on millions of charities, foundations and voluntary organisations - but only a small proportion are making the most of digital, and they need help to catch up.

Then there's finance. Europe has done well in nurturing big flows of venture capital investment into digital over the last decade, catching up with the US, Israel and other countries which had jumped ahead. But now it needs to do the same for social and impact investment to give the best social innovations the chance to develop and grow. After all, many of the household names of the digital economy lost money for years and only grew because of patient investment on a very large scale. It's not surprising the alternatives have struggled to compete.

It should now be obvious that any 21st-century innovation strategy needs to encompass the ideas and energy of the digital social innovators. But too often public power and money are still locked in much more traditional methods, monopolised by big business and big science in a handful of well-connected sectors. Hopefully this report, and the project it is part of, will take us closer to the tipping point when the many movements that together contribute to DSI – makers, open data, social entrepreneurs and others – can take their rightful place in the mainstream.

Geoff Mulgan
Chief Executive, Nesta

Although too often shadowed by the strong commercial interests of dominant online platforms, the potential of networking technologies for creating new meaningful forms of human collaboration, innovation and resilience is enormous, and this report is probably the best effort currently available to explore this growing reality.

This is of utmost importance: DSI is developing public services by the citizens and for the citizens, collaborative approaches to preserve the environment, new participatory economic models, and also a more open, fair and decentralised Internet.

As the pioneering CAPS projects are showing, nurturing this kind of bottom-up innovation is a multifaceted challenge, encompassing different societal dimensions: economy, experience, culture, democracy, integration. We need to accumulate more experience with the new paradigms enabled by network effects and collective intelligence, and in turn these techno-social experiments dramatically depend on support from public programmes. We need to create awareness about the potential applications of the hyperconnected society, both in the citizens who will benefit from it and in the researchers who are developing the solutions, wrapping together a large spectrum of competences from all avenues of life and human sciences. We need to learn how to leverage the unprecedented decentralisation possibilities offered by networking technologies to improve democratic processes. And we need to be as open as possible, in both technology and society, to integrate new people, ideas and sustainability models.

This report is a key contribution to better understanding and addressing these open challenges.

Fabrizio Sestini
Senior Expert Digital Social Innovation, DG CONNECT, European Commission

The views expressed in this Foreword are the sole responsibility of the author and in no way represent the view of the European Commission and its services.

ACKNOWLEDGEMENTS

We are extremely grateful to the European Commission, DG-CONNECT for funding the DSI4EU project.

We would like to thank our colleagues at Nesta, particularly **Amberley Barrington-Peek**, **Geoff Mulgan**, **Eddie Copeland** and **Nadja Ohranovic** for their guidance, knowledge and humour, and **Daniel Pettifer** and **Alexandru Pandele** for ensuring the success of the digitalsocial.eu website. Thanks also to **Theo Bass**, **Jonathan Bone**, **Alice Casey**, **Carrie Deacon, Madeleine Gabriel**, **Lucy Heady**, **Manny Hothi**, **Antonia Lima**, **John Loder**, **Sophie Reynolds**, **Kostas Stathoulopoulos**, **Andrew Strachan**, **Tom Saunders**, **Hilary Simpson** and **Tom Symons.**

We would also like to thank all those involved in the DSI4EU project: **Fabrizio Sestini** (DG Connect), **Serena Cangiano** (SUPSI), **Zoe Romano** (WeMake), **Job Spierings**, **Gijs Boerwinkel** and **Marleen Stikker** (Waag Society), **Frank Kresin** (Design Lab, University of Twente), and **Michelle Nebiolo**, **Andrea Corradi**, **Fabio Franchino** and **Emilio Bondiolo** (TODO). We are also grateful to the project's Advisory Group who have been generous with their time and forthcoming with their support.

We are grateful to all those who have contributed to this research paper: **Mico Curatolo** (Be-Come), **Jessica Stacey** (Bethnal Green Ventures), **Carolin Silbernagl** and **Ben Mason** (betterplace lab), **Dan Sutch** and **Ellie Hale** (Centre for Acceleration of Social Technology), **Ángel Sola** and **Yolanda Rueda** (Cibervoluntarios), **Wietse Van Ransbeeck** (CitizenLab), **Gunnar Grímsson** (Citizens Foundation), **Jessica Duveen** and **Simon Evill** (ClearlySo), **Billy Dann** and **Malcolm Spence** (Comic Relief), **Teele Pehk** (Co-operation Assembly), **Johannes Mikkonen** (Demos Helsinki), **Krzysztof Izdebski** (ePaństwo Foundation), **Pieter van Boheemen** (FabLab Amsterdam), **Tomas Diez** and **Massimo Menichinelli** (FabLab Barcelona), **Tessa Wernink** (Fairphone), **Jean Ekwa** (FRSI, **Victoria Stirling** (Good Things Foundation), **Olivier Schulbaum** (Goteo), **Germán Bencci** (Code Your Future), **Mike Green** (Green Doe Design), **Mara Balestrini** (IAAC), **John Bracken** (Knight Foundation), **Hannah Keartland**, **Leslie Harris** and **Andy Paterson** (Cancer Research UK), **Audrey Jarre** (Liberté Living-Lab), **Sherry Huss** (Maker Faire), **Monique Calisti** and **Miguel Alarcón** (Martel Innovate), **Marietje Schaake MEP**, **Mark Cridge** (mySociety), **Daniel Robinson** (Nominet Trust), **Linde Wolters** (Oksigen Lab), **Hera Hussain** (Open Corporates), **Julia Kloiber** (Open Knowledge Germany), **Victoria Vlad** and **Diana Krebs** (OpenSpending), **Benjamin Tincq** and **Antonin Léonard** (OuiShare), **Daan Weddepohl** (Peerby), **Hille Hinsberg**, (Praxis), **Mattia Bernini** (Precious Plastic), **Dushan Jankovic** (Razlivaliste), **Sean Bonner** (Safecast), **Nick Stanhope** (Shift Design), **Louise Pulford** and **Lorna Reed** (SIX), **James Marchant** (Small Media), **Antonella Passani** (T6), **Francesca Bria** and **Mariona Alloy Ciller** (The City of Barcelona), **Fabrizio Alessio** (Too Wheels), **Alastair Parvin** (Wikihouse Foundation), **Maria Schwarz** (ZSI) and **Mayo Fuster Morell**.

Finally we would like to thank all those who have created profiles on digitalsocial.eu. Your work inspires us every day.

Of course, all errors and omissions remain our own. If you have any feedback about this report, please contact **dsi@nesta.org.uk**.

EXECUTIVE SUMMARY

The DSI4EU project has been mapping and supporting digital social innovation (DSI) initiatives across Europe since February 2016. Based on interviews with DSI practitioners, other stakeholders and data collected through the digitalsocial.eu platform, this report explores the recent evolution of DSI, barriers to growth, and what needs to be done by policymakers, funders and practitioners to make the most of the opportunities in DSI.

As of May 2017, there are 1,883 organisations and 1,051 projects on the digitalsocial.eu platform. The most common technologies used by projects are Social Media and Social Networks; Crowdsourcing, Crowdmapping and Crowdfunding; and Mobile and Web Apps, while the most common social areas of activity are Education and Skills; Participation and Democracy; and Culture and Arts. Geographically, most activity is taking place in Western and Southern Europe with the UK, France and Spain showing the highest level of activity, with Northern Europe less active and Eastern Europe even less active. Analysis of other data related to DSI, such as through Twitter, shows similar trends.

We are far from making the most of the potential in DSI with few examples of DSI achieving impact at scale. Systemic barriers to growth include the availability and accessibility of funding and skills, a fragmented ecosystem and limited uptake of DSI by the public sector and established civil society organisations (CSOs). At the level of individual organisations and projects, the main barriers lie in engaging citizens, planning for growth and developing sustainable business models. These barriers are compounded by the lack of understanding and measurement of impact in DSI.

However, we have encountered many exciting ways in which these challenges are being addressed. The funding and support systems are maturing in the UK and France, while cities like Barcelona are pioneering ways to integrate DSI into public services. National governments are waking up to the potential of DSI, as shown by the German Government's Prototype Fund,[1] and examples of sustainable business models are emerging. This report showcases several of these stories to share good practice and to encourage learning, inspiration and adaptation.

To support DSI to grow its impact and move from the periphery to the mainstream, we make recommendations to policymakers and funders and we include a set of practitioner guidelines to support initiatives' development and growth. We hope this report provides a foundation for greater collaboration between stakeholders so that we can begin to realise the transformative potential of DSI.

Our recommendations to policymakers and funders

1. Support DSI through funding mechanisms.
2. Invest in intermediaries and the support infrastructure for DSI.
3. Invest in and enable DSI approaches within existing civil society organisations.
4. Enable peer learning and the spread of best practice.
5. Conduct further research into the supporting conditions and models for growth and sustainability of DSI.
6. Use public procurement to advance DSI.

INTRODUCTION

Across Europe, thousands of people, projects and organisations are using digital technologies to tackle social challenges in fields like healthcare, education, employment, democratic participation, migration and the environment. These initiatives use emerging and established technologies, from wikis and crowdfunding to blockchain and machine learning, to engage citizens in collaboratively delivering social impact. They have the potential to transform the way our public services operate, revitalise civic life and allow citizens to become direct participants in tackling social challenges. We call this phenomenon digital social innovation (DSI).

In 2015, we published the first study of DSI in Europe, which sought to make sense of a then-unexplored landscape. Two years on, the field of DSI has grown significantly; our online database now contains 1,883 organisations and 1,051 projects. DSI is catching the attention of policymakers, governments, civil society organisations (CSOs) and major funders. In some cases, it has become institutionalised in government, as shown by the Barcelona Digital Plan, which has DSI at its core, the Prototype Fund, a €1.2 million fund for open-source projects in Germany, or ProZorro, an online procurement platform in Ukraine which public bodies are now legally obliged to use, all of which are profiled in this report.

However, there have been relatively few examples of DSI initiatives growing to deliver social impact at scale, being integrated into public services, or collaborating with established CSOs. This research, part of the European Commission-funded DSI4EU project, explores why DSI has not yet entered the mainstream and offers a way forward to support DSI to reach its potential.

In order to understand what is holding back the growth of DSI, and to find best practice, we have conducted over 30 interviews alongside a review of academic and grey literature. This has been complemented by insights gained from the digitalsocial.eu website and the events we have held and attended over the past year and a half.

The report is structured as follows:

- In the **first** section, we define DSI, explain why it is relevant today, and give examples of how it can deliver impact in different social areas.
- In the **second**, we explore growth and trends in DSI across Europe, and seek to understand how projects and organisations are connected to each other.
- In the **third**, we explore barriers to growth and how these can addressed. We look at challenges at the macro (ecosystem) and micro (project/organisation) levels, and showcase examples of good practice. Barriers in the former category concern availability and accessibility of funding and skills and uptake of DSI by the public sector and civil society. Barriers in the latter concern practitioners' ability to engage users, articulate and measure impact, and understand routes to growth and sustainability.
- To conclude, we offer a set of six recommendations to funders and policymakers.
- Following this is a practical guide designed to support practitioners with engagement, impact measurement and growth.

This is not a comprehensive study of the field of DSI, but rather an analysis of what we have found over the course of the DSI4EU project. There is much more work to be done to understand the challenges and solutions in particular social areas, technologies and countries. We hope this report provides a foundation for further research and spurs action among stakeholders to support DSI to reach its transformative potential.

SECTION 1: WHY DSI AND WHY NOW?

Digital technologies and the internet are particularly well suited to helping civic action, as they can mobilise large communities, facilitate resource-sharing and distribute power downwards.

Since the pioneering work of organisations like mySociety and Open Knowledge International in the early 2000s, a large community has developed of people employing digital technologies to address our most pressing social challenges in areas like healthcare, education, democracy, corruption, environment and employment.

We call this digital social innovation (DSI). Below we discuss the characteristics of DSI, and we illustrate the potential of DSI in different social areas on pp. 12-16. This builds and expands on lessons from our first study on digital social innovation, published in 2015.[2]

What is DSI?

As DSI is an evolving and broad field, it is difficult to find an all-encompassing definition. Furthermore, as other similar fields like 'civic tech' and 'tech for good' are also becoming common currency (as discussed on p.11), there is limited use in boxing ourselves into a strict definition.

However, for the purpose of this study we continue to use the definition used by the DSI project (2014-15):

"A type of social and collaborative innovation in which innovators, users and communities collaborate using digital technologies to co-create knowledge and solutions for a wide range of social needs and at a scale and speed that was unimaginable before the rise of the Internet."[3]

Building on this, we pay particular, although not exclusive, attention to initiatives which:

- Have a social impact;
- Adopt new technology trends in a novel way;
- Aim to empower citizens for individual and collective awareness;
- Demonstrate a clear network effect;
- Focus on supporting and working with grassroots or 'bottom-up' communities of users.

As we explore in Section 2 (pp.27-28), initiatives are using a wide range of digital technologies ranging from the relatively simple to the cutting edge. However, looking across the spectrum, we can observe four overarching technology trends:

- **Open data**: Capturing, sharing, analysing and using open data to tackle social challenges;
- **Open hardware**: Making things with open hardware to tackle social challenges;
- **Open networks**: Growing networks and infrastructure through technology from the bottom up to tackle social challenges;
- **Open knowledge**: Harnessing the power and assets of the crowd to tackle social challenges.

Finally, DSI initiatives benefit from network effects. This means that as the size of the network increases, the value to each user increases, and the overall value of the innovation increases by more times than the size of the network. For example, a food-sharing platform is of limited use if it has very few users. As more users join, the value to each user increases, as there will be more givers and receivers of food at any given time.

The value overall increases, as more food will be shared leading to (for example) less food waste and more social interactions. Network effects are a major enabler for DSI to deliver impact, but also pose a problem to initiatives in their early stages, as they must reach a critical mass of users before they deliver value and impact to users and beneficiaries.

DSI – What's in a name?

DSI is not the only term used to refer to the use of digital technology to address social challenges. 'Civic technology', defined as *"technology that enables greater participation in government or otherwise assists government in delivering citizen services and strengthening ties with the public,"*[4] is probably the most widely-used term worldwide today, including by sector leaders like Civic Hall,[5] the Knight Foundation,[6] mySociety[7] and Empodera.[8] 'Tech for good' is another broad definition which is particularly common in the UK, used by organisations like Bethnal Green Ventures,[9] Comic Relief[10] and Tech For Good Global[11] and the global NetSquared network.[12] 'Social tech' is another term, used by Nominet Trust[13] (the UK's only dedicated tech for good funder). The field of DSI has significant overlap with all three terms, and for the purposes of this study we have spoken to practitioners who use all of them and drawn upon literature about all of them.

Europe is facing multiple and complex challenges, from climate change to mistrust in democracy, from the difficulties which come with an ageing population to rising inequality. In the following pages, we explore some of the examples of where DSI is already delivering social impact in different areas.

Clockwise from top left: Fairphone, Carticipe, OpenDrop, Open Corporates.

Digital democracy

Across much of the western world, there is widespread disillusionment with existing political institutions. Membership of traditional political parties is falling, turnout in elections is consistently lower than it was two decades ago, and people have little trust in their elected representatives.[14]

Large minorities in Europe and the US no longer see democracy as a good system of government, particularly young people.[15] According to the Economist Intelligence Unit's (EIU) Democracy Index in 2014 and 2015, not only are participation rates low, but the highest levels of disengagement have arisen in 16 out of the 20 countries classified as 'full democracies'.[16]

Digital democracy platforms are seeking to address this in two main ways:

Increasing engagement and collaborative policymaking

Across Europe, political parties and governments are turning to digital democracy tools to engage a greater number of people in collaborative decision-making to improve both the legitimacy of democracy and the quality of policy. One method being adopted is participatory budgeting. For example, Paris' municipal government has committed €500 million to fund crowdsourced ideas through its initiative Madame La Maire, j'ai une idée.[17] Similarly, the Better Reykjavik[18] open-source platform, which enables citizens to submit ideas and information, rank priorities and allocate public resources, has enabled roughly €3.6 million of investment in more than 400 citizen ideas. This open-source platform was then adopted in Estonia as the Estonian People's Assembly, Rahvakogu,[19] which crowdsourced over 2,000 proposals in three weeks, with 14 proposals reaching parliament. This ultimately led to the development of Estonia's own digital democracy platform, Rahvaalgatus.[20]

Increasing transparency

As well as supporting a more inclusive and representative democracy, digital democracy initiatives are being used to increase transparency and hold governments to account. For example, Hungary's K-Monitor[21] provides a database of public spending to ensure that politicians can be held accountable for the decisions they make. Likewise, Romania's fact-checking platform, factual.ro, holds individual politicians to account by assessing the truth and consistency of their claims.

The vertical gardens in Paris were financed by the city after a process carried out through the Madame La Maire, j'ai une idée participatory budgeting initiative.

Health and care

Over the past twenty years healthcare spending has risen faster than economic growth in all OECD countries and, according to projections, public expenditure on health and long-term care is set to increase from around six per cent of GDP today to almost nine per cent of GDP in 2030 and as much as 14 per cent by 2060.[22]

As much of this cost is associated with long-term conditions and health problems associated with lifestyle factors, there is increasing pressure on individuals to self-manage care, and on services to better collect and use information to optimise care. This, supported by active and engaged communities, has driven promising examples of DSI addressing challenges around long-term care and conditions, through exploring opportunities in open data, open hardware and crowdsourcing patient information.

Many DSI initiatives are using the opportunities presented by open-source technology to create cheaper and more specialised solutions for people living with disabilities. Open-source projects like Too Wheels and Disrupt Disability, which are each developing different types of wheelchair, allow for increased user personalisation and a lower cost of production. Open software projects are lowering the financial and physical barriers faced by those with disabilities. The Open Voice Factory, for example, has created communication aids which can be used freely on a laptop, tablet or phone, while wheelmap.org provides a platform for identifying wheelchair accessible places, with over 750,000 locations mapped to date.[23]

Other healthcare initiatives target specific chronic illnesses or the effects of ageing. For example, OpenAPS,[24] the Open Artificial Pancreas System, uses open-source hardware and code and was developed by patients frustrated by traditional methods of FDA-approval and commercialisation. Other projects work only with data, such as Crohnology,[25] which allows patients with Crohn's disease to compare the effects of diet and medications on their symptoms.

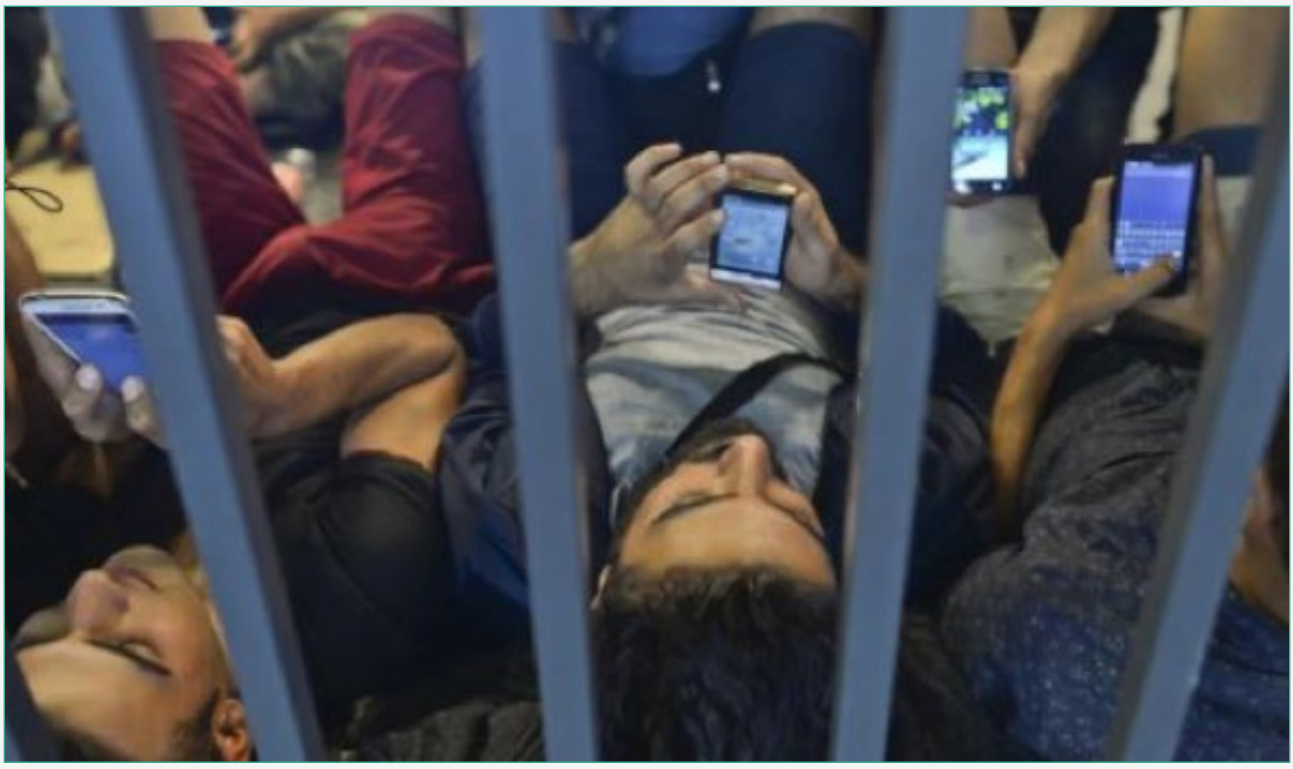
Fabrizio Alessio, founder of Too Wheels, alongside two different types of sports wheelchair.

Migration and integration

With conflict, poverty and climate change contributing to large numbers of refugees arriving in Europe, the need for innovative solutions to support and help migrants has grown rapidly. While adequate political solutions are yet to emerge, DSI has been able to help the thousands of people requiring access to basic services such as healthcare, education, identity recognition and internet.

Research by betterplace lab suggest that there are at least 130 DSI initiatives[26] in Europe supporting migrants. Some support refugees in transit. For example, MeshPoint is an open-source device which facilitates WiFi hotspots in rugged conditions enabling migrants to contact their families or find critical information. Other DSI initiatives are working to tackle a range of issues associated with making a home in a new country, including orientation information (refugeeinfo.eu[27]), supporting wireless community networks for internet access (FreiFunk[28]), language acquisition (WhatsGerman[29]), medical support (MedShr[30]), family reunification (Refunite[31]), accommodation (CALM[32]), higher education (Kiron[33]), building social connections (Start With A Friend[34]), job market integration (refugeeswork.at[35]), mapping of services available to refugees (clarat[36]), as well as platforms to better coordinate civil society response and volunteers (Lale[37]).

We have also seen the development of DSI communities around this issue. Techfugees,[38] a tech-led response to the needs of refugees, has quickly grown to a network with more than 15,000 members in chapters around Europe. One of their projects is BASEFUGEES, an open-source platform that matched technology solutions to NGO challenges.



Projects like MeshPoint allow refugees in remote places to access internet on their phones.

Food, environment and climate change

Environmental issues transcend national borders. Similarly, the collaborative and digital nature of DSI enables it to bring together large numbers of people to form alliances and address environmental issues in ways that national government policy cannot. As concerns about the environment and climate change grow, a number of citizen-led and collaborative DSI initiatives have been enabled by open hardware and collaborative digital platforms.

For example, the Making Sense project (explored on pages 100-101) uses inexpensive open-source sensors to revolutionise the way environmental data is collected, empowering citizens to take more control over their local environment. Digital platforms are enabling open data on the environment to be shared in new ways, bringing together different groups of people with an interest in their shared environment. The open-source nature of many of these programmes means that the initiatives can be shared across Europe. For example, Code for Germany's platform[39] for sharing open data on the quality of drinking water has been imitated in Ireland to facilitate a similar project, Transparent Water.[40]

The breadth of DSI is reflected in the range of solutions being developed: from Aquapioneer's[41] open-source hydroponics solution to food-sharing platforms such as OLIO[42] and Casserole Club,[43] and from projects like Fairphone,[44] which seeks to make supply chains more transparent and produces the world's first ethical smartphone, to Safecast,[45] which aggregates citizen-generated data on radioactivity across the world.

The Fairphone, and the responsibly-sourced copper used to make its components.

Skills and learning

The digital revolution is rapidly expanding the range of skills people require in order to thrive, both personally and professionally. DSI equips us with new methods of learning and offers the chance for more people than ever to learn a wide range of skills. Furthermore, the distributed nature of DSI is lowering the barriers to entry to a range of interests and professions.

For example, the Fab Academy[46] identified the importance of skills related to digital making - a growing trend across Europe and the world. Established in 2009, its vision is to offer courses online sharing knowledge which was previously shared in prestigious and innovative, but rather secluded, institutions. Another initiative spreading the use of maker tools has been launched by Roma Makers, one of Italy's first makerspaces. The project has equipped 20 schools in Rome with tools like 3D printers, milling stations and laser cutters to teach children digital fabrication.[47]

Code Club,[48] which was set up in 2012 to facilitate volunteer-led after school code clubs for young children, has now delivered classes to around 100,000 children in 100 countries across the world.

Besides supporting the development of digital skills, new methods of learning are also leading to breakthroughs in shared knowledge across the world. Citizen science initiatives harness the power of crowdsourced time and skills to perform tasks that would otherwise require enormous resources. For example, Old Weather[49] volunteers read ship logbooks from the 19th and 20th century and record the weather reports they find. This information is then used to inform our understanding of climate change over a longer time period. Similarly, Genes in Space,[50] a game developed in partnership with Cancer Research, enabled players to play the role of dedicated researchers working to identify DNA faults that could lead to cancer.

Children in school make their own Christmas decorations in one of Rome's new 'mini-makerspaces'.

Harnessing emerging technologies for DSI

In this report, we focus primarily on the applications of technologies which are established or beginning to establish themselves: for example, open data, open hardware, crowdsourcing, citizen sensing and digital fabrication. As discussed in Section 2 (pp.27-28), most projects in the field of DSI are using such technologies.

However, it is important to note the relevance of newer and emerging technologies like blockchain, artificial intelligence (AI) and virtual and augmented reality (VR and AR). These technologies have so far been most widely applied commercially, bringing with them both positive and negative disruption to industry, the economy and our societies, but they also have the potential to transform the way we address social challenges using digital tools.

We are beginning to see inspiring examples of how these emerging technologies can be applied for social impact, some of which are mentioned below. Because it is such a nascent area, its relevance to many DSI stakeholders is limited at this time. Nevertheless, because it will only become more relevant in coming years, it is important that funders, policymakers and researchers remain vigilant to the potential of emerging technologies and invest in their application for social good. More urgently, policymakers must also work to ensure pressing issues such as data protection, privacy and centralisation are addressed to ensure a future internet which puts citizens at its centre.

Applications of emerging technologies

A number of initiatives based on artificial intelligence – technologies which use computers to carry out 'cognitive' tasks – have emerged. One example is the Robot Lawyer,[51] a chatbot which supports refugees to fill in immigration applications in the US and Canada and helps those in the UK apply for asylum support. Similarly, initiatives such as iris.ai use AI to create scientific research assistants capable of reading the ever-growing volume of research in areas like climate change. This enables scientists and policymakers to make decisions based on analysis and recommendations at a much quicker pace than they could do before.

Elsewhere, predictive analytics based on AI and machine learning systems are using big data to predict where and when disasters like flooding may happen. Startups like Cloudtostreet[52] and even multinational corporates like Microsoft[53] are developing initiatives in this field. Other organisations like Descartes Labs[54] are taking similar approaches, combining satellite imagery data and advanced analytics to predict crop yields and forecasting shortages in time to prepare for them. Public institutions are also beginning to use these technologies; for example, Makerere University in Uganda is pioneering inventive uses of imaging data and locally-available technology, developing a number of automated systems which work off $100 (€90) smartphones to capture images, analyse data and generate insights.

One application of this technology is an automated system which diagnoses crop diseases with computer vision techniques and has been able to provide real-time map information to local farmers to improve disease management.[55] In healthcare, AI is being used to address challenges ranging from predicting heart attacks[56] to tackling loneliness among older people.[57]

Other emerging technologies like Augmented Reality (AR) and Virtual Reality (VR) present many opportunities for tackling social challenges. This includes the potential to provide support and treatment for mental health problems at scale; projects like Bravemind[58] are currently developing and testing these tools. Elsewhere, startups like NuEyes are using to help millions of people with macular degeneration to see again.[59] However, products like these are not being widely used yet, and in many cases the cost is prohibitive for potential users.

Finally, in the field of blockchain, initiatives are already addressing big challenges, particularly in the developing world, such as money remittances, accessing insurance, managing humanitarian aid and providing digital identity and increasing transparency.[60] AID:Tech is one of the leading organisations in this field, using blockchain to issue digital identities to financially-excluded people including refugees. Focusing on transparency, Provenance has developed a platform through which brands can trace the origins and histories of products using blockchain and open data technologies.[61]

DSI and the next generation internet

The potential of these technologies is great; however, they also come with risks. Some of these technologies are already manifesting negative impacts, such as embedded discrimination in algorithms or 'fake news' in algorithmically-generated social media and news feeds. Therefore, those using these technologies for social purposes must do so responsibly and ethically.

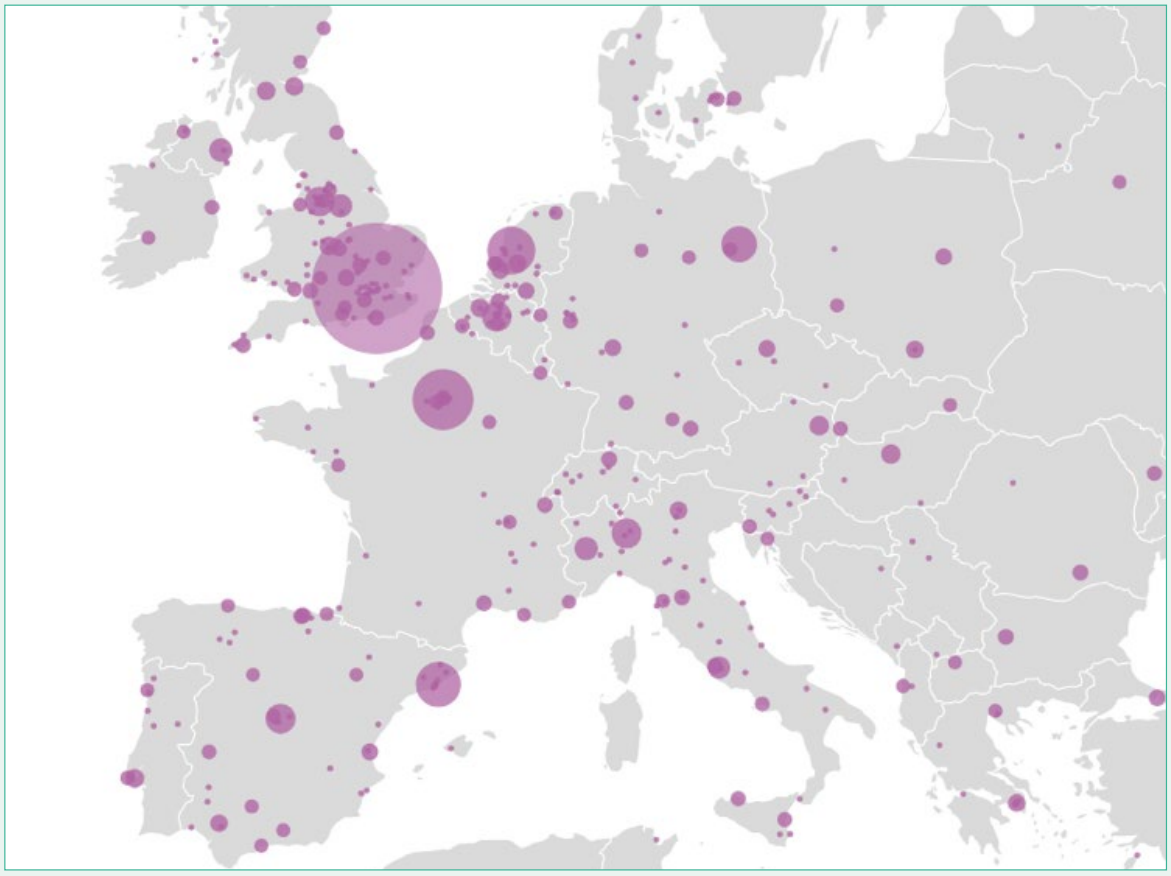
Such ethical concerns are also growing about the future of the internet as a whole. The concentration of data, and by extension power, in a small number of tech platforms, along with our reliance on their benevolence, is a growing worry for citizens and governments. A number of projects are seeking to address these concerns. These include decentralised alternatives like Mastodon (which has functionalities like Twitter, but does not centrally store data) and ind.ie, a set of tools offering decentralised key infrastructure components of the internet; personal information management systems, such as HAT and digi.me; and personal data commons, such as the Decode project. These challenges will need to be addressed by both grassroots initiatives and regulators, and it is essential that in the coming years steps are taken to protect the rights of citizens using the internet and to ensure emerging technologies are being used for the benefit of society.

SECTION 2: UNDERSTANDING DSI ACROSS EUROPE

To support DSI in Europe we need to understand what characterises the DSI community – what are its strengths and weaknesses and what are the main trends within organisations and projects working on DSI?

In the following chapter we explore a number of characteristics and trends around four major themes: geographical spread, social impact, technologies being used, and the connectedness of the DSI ecosystem.

We find great diversity in DSI activity across Europe, in terms of geography, social areas and technologies. While this is encouraging for the latter two variables, it is concerning to see significant geographical disparity between countries and regions, with more activity in Western and Southern Europe and a number of key cities. Looking at other variables, we find that DSI projects tend to adopt multiple technologies to address multiple issues, mainly focusing on more established technologies, and that they use varied language to describe their approaches. Finally, we find that the DSI ecosystem is still poorly networked, although progress has been made in recent years.



DSI activity across Europe. Circle size is proportional to the number of DSI organisations in that location.

Our research methods and key findings

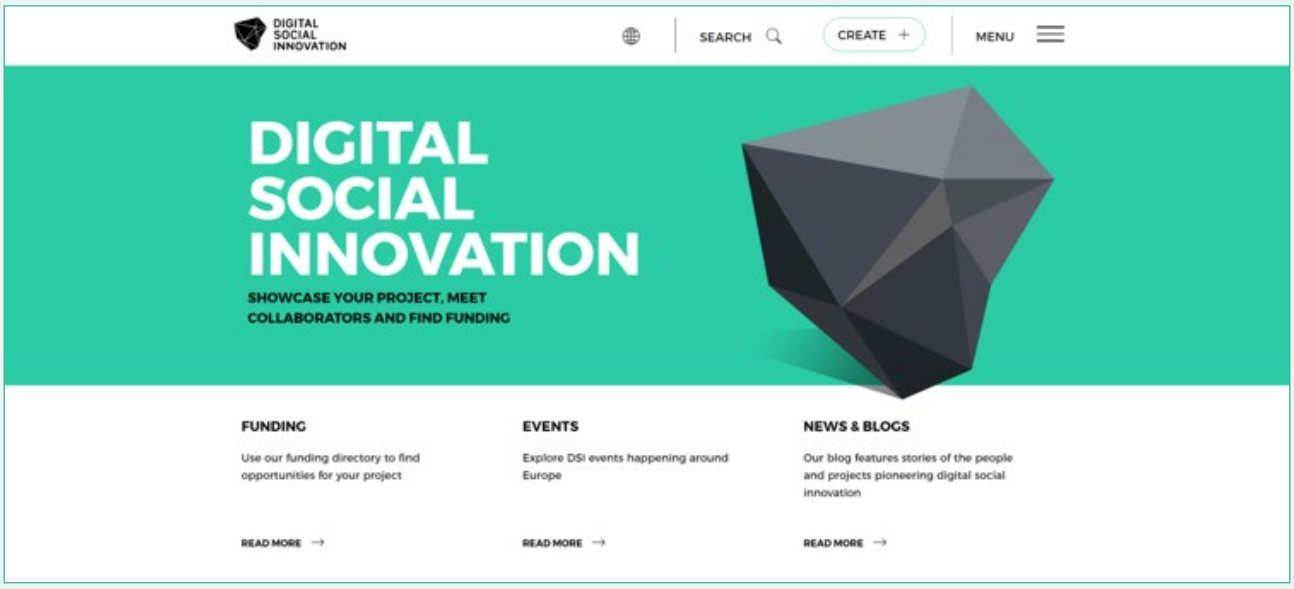
Our primary resource for this research is the digitalsocial.eu database of 1,883 DSI organisations and 1,051 DSI projects. This data has enabled us to analyse the geographical spread of DSI in Europe, the social and technological trends that characterise DSI initiatives, and the level of connectedness between DSI projects and organisations. We support this analysis with data on existing European DSI sub-communities, such as on fablabs and meetups, and an exploration of how social media analysis can offer new ways of understanding the DSI community and its connections.

Analysing data from digitalsocial.eu

The digitalsocial.eu platform was developed by the DSI4EU project. It offers users the ability to:

- Create detailed profiles showcasing their organisations, projects and collaborators;
- Find listings of DSI-related events, funding and support opportunities;
- Learn about emerging trends and stories of DSI through case studies and blogs;
- Use the platform's data visualisation tool[62] to explore the database and identify related projects and potential future collaborators.

The detailed profiles created by platform users have helped create the open dataset used for this analysis. Alongside creating a profile for their organisation and their organisations' DSI projects, users can tag projects by the specific social challenges they are focusing on and the technologies they are using in their project, using a combination of pre-defined categories and free-text tags. They can also list collaborators on individual projects, which helps map the connections between DSI projects and organisations in Europe. To encourage uptake across Europe the platform has been translated into five languages (Catalan, French, German, Italian and Spanish) and the DSI4EU project engaged other DSI networks from across Europe in involving their users in the platform.



The digitalsocial.eu platform.

Some of the organisations who helped us engage their networks in the digitalsocial.eu website.

The platform and its users' commitment has produced one of the most detailed databases on DSI activity in Europe, but it has its limitations. Projects and organisations are self-selecting, and the main project partners of DSI4EU were based in Western Europe.

While the analysis below is based on project and organisation data correct as of May 2017, the data set continues to grow as projects and organisations map new initiatives. We invite readers to use the data visualisation tool at **digitalsocial.eu/viz/** to explore the dataset as it evolves, and to continue adding new projects and organisations to the platform. All non-personal data captured via the platform is open and can be downloaded in different formats, allowing those interested to further interrogate and analyse the data.

Mapping DSI using Twitter data

To further our understanding of the DSI landscape in Europe and validate insights from the digitalsocial.eu platform, we experimented with analysing social media data collected through the Twitter API.[63]

To understand geographical spread, we collected a sample of tweets which included one of several hashtags related to DSI. Tweets were assigned to countries based on the tweeter's stated location. Not all users state their location, but most do.[64] Our analysis was based on a total of 6,822 tweets collected over a nine-day period in April 2017.[65]

This type of analysis is promising and merits further investigation, but it has limitations:

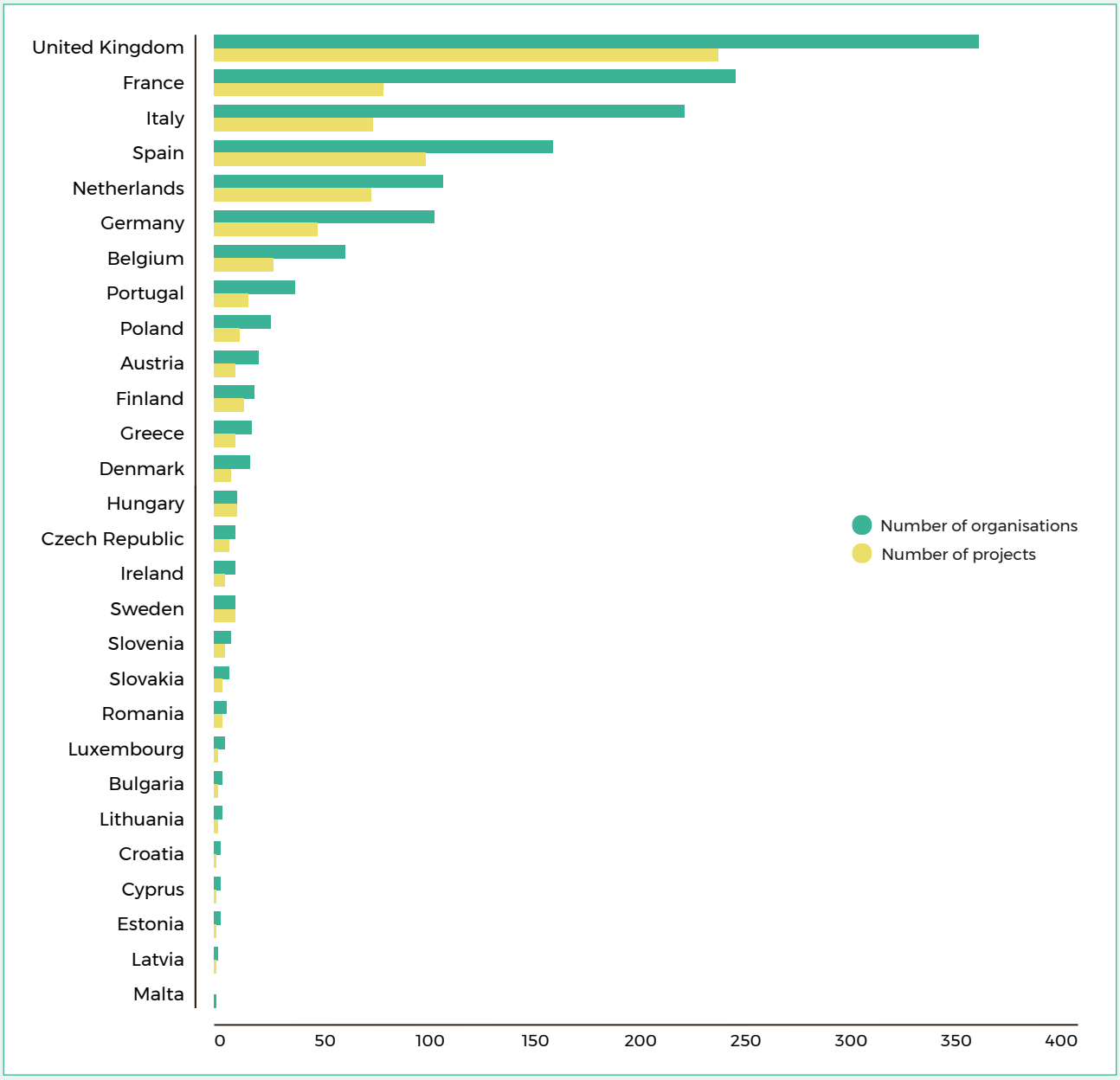
- All the hashtags used in this analysis were in English or were abbreviations of English phrases. While English is by far the most used language on Twitter, used by non-native as well as native speakers, we may have missed some popular DSI-related hashtags and therefore biased the analysis in favour of countries where English is a primary or very widely-spoken language. In future research, such hashtags could be identified by analysing the tweets posted by known DSI organisations.[66]
- Twitter usage is not uniform across Europe. While this could be overcome by standardising the number of tweets by the number of Twitter users in each country, up-to-date data on the number of Twitter users by country is not readily available.
- We looked at only nine days of data. Future research would aim to look at a far longer time period to ensure representativeness.

To further our understanding of connectedness between DSI organisations, we collected information on the followers of twelve organisations active in DSI.[67] Due to time constraints and restrictions on the amount of data that can be collected through the Twitter API in a given time period, we only collected the IDs of ten per cent of the following of each DSI organisation. If any of the twelve organisations followed each other, we ensured they were included in the ten per cent sample. All data was scraped in early May.

How is DSI activity spread across Europe?

There are organisations working on DSI all across Europe. Encouragingly, there is at least one organisation registered from every member state, and at least one project from every member state except Malta. (The database also contains several organisations and projects from non-member states.) However, there are major disparities in the geographical spread of DSI (Figure 1).

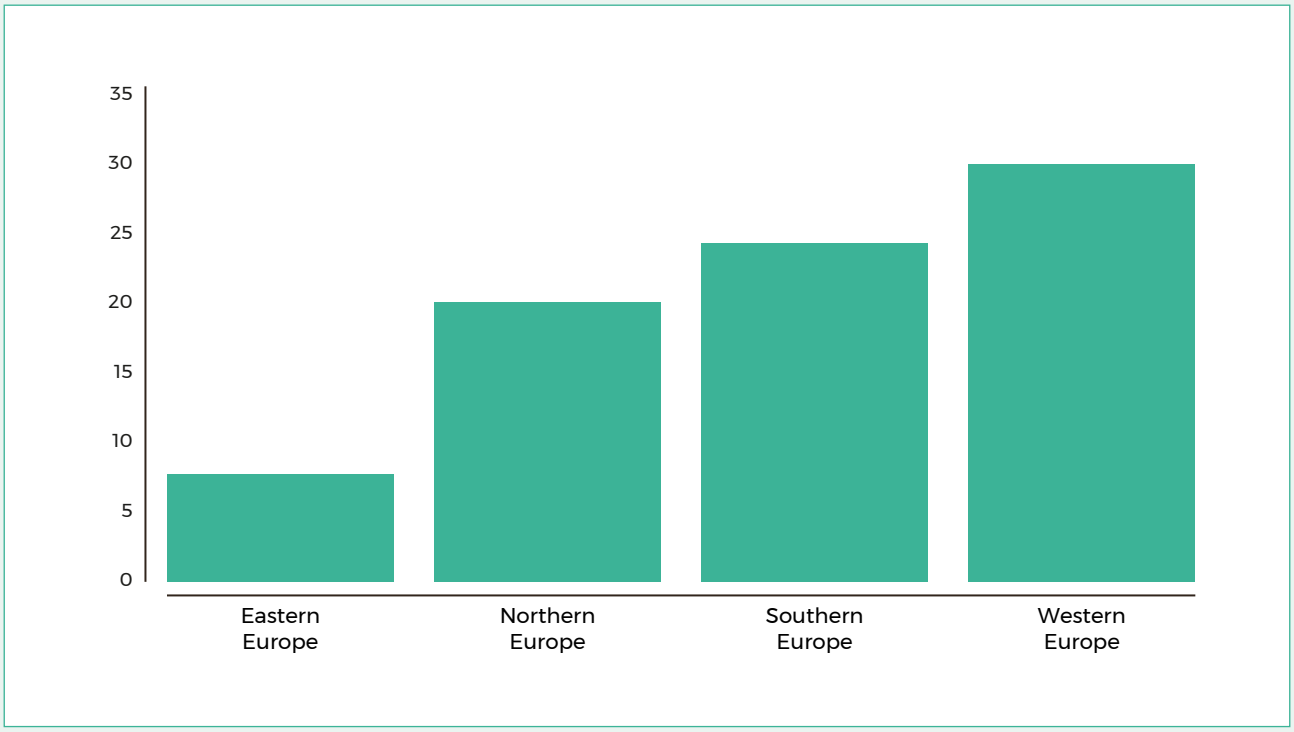
Figure 1: Number of organisations and projects by country



The five countries with the most DSI organisations - the UK (361), France (246), Italy (222), Spain (160) and the Netherlands (108) – represent 74 per cent of the organisations mapped on digitalsocial.eu. In contrast, 11 of the 28 EU member states have fewer than ten DSI organisations each listed on the platform.

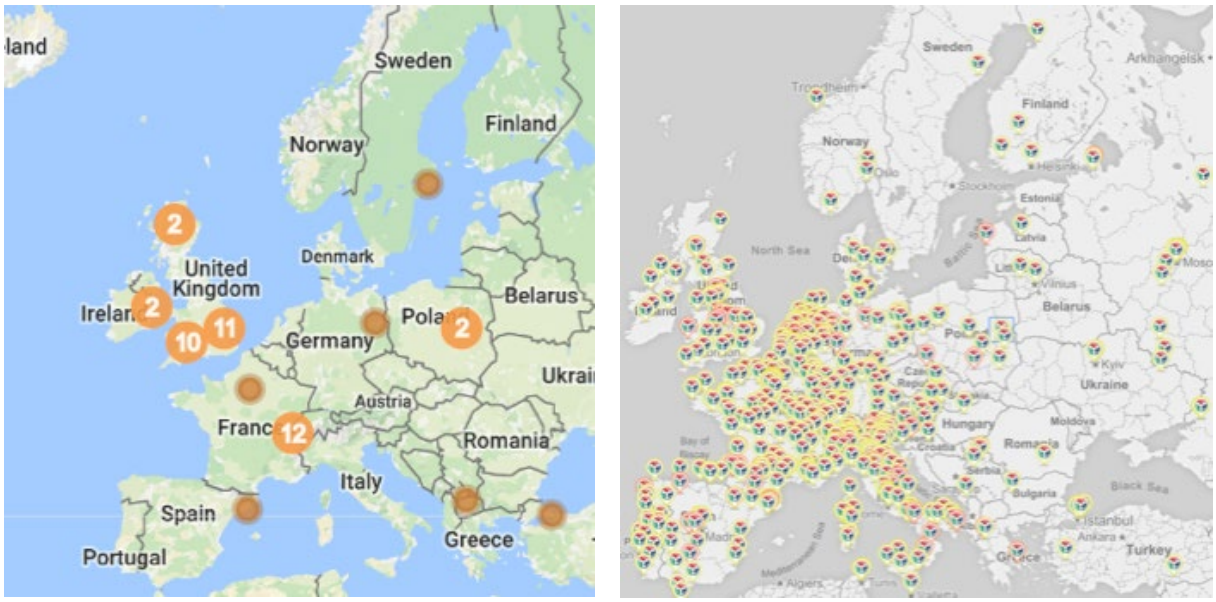
Furthermore, when comparing the different regions of Europe as defined by Eurovoc,[68] we see that Western Europe has 30.0 DSI organisations per 100,000 population, while Northern and Eastern Europe see much less DSI activity with only 20.1 and 7.7 organisations per 100,000 population respectively (see Figure 2). As shown below, other indicators find similar national and regional disparities, and in Section 3 we explore these disparities through qualitative research.

Figure 2: Number of organisations per 100,000 population by region of Europe



This trend is mirrored by other data on Europe-wide DSI-related activity. Figure 3a shows that NetSquared meetups, which focus on technology for non-profit organisations, has most groups in Western Europe with relatively little activity in Northern and Eastern Europe. Figure 3b shows a similar distribution of fablabs, with proportionally few found in Eastern and Northern Europe compared to Southern and Western Europe.

Figure 3a and 3b[69]: Distribution of NetSquared groups and fablabs across Europe



The digitalsocial.eu data also shows a particular density of DSI within cities. As shown in the image on p.19, a number of European cities, including London, Paris, Amsterdam, Barcelona and Berlin, are centres for DSI development. This mirrors tech clusters in Europe more widely, with all of these cities ranked within the top ten European cities most supportive of digital entrepreneurs by the 2016 European Digital City Index (EDCI).[70]

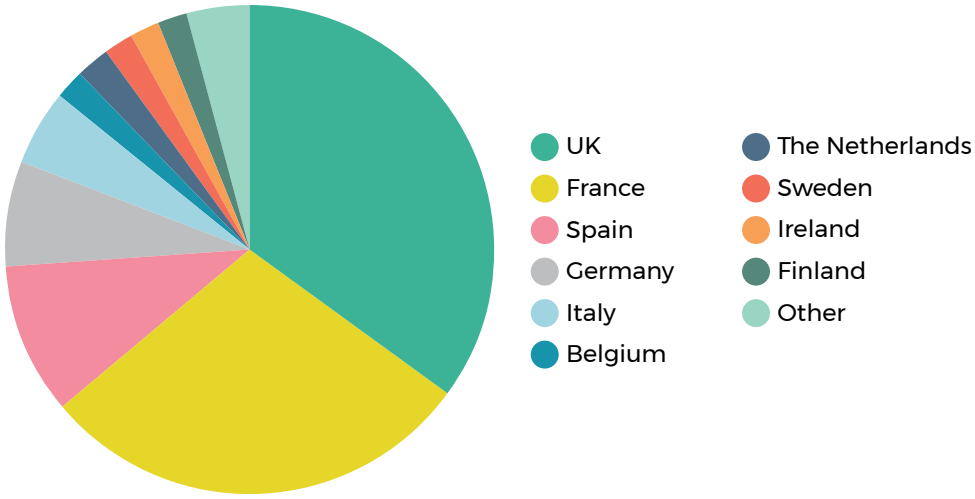
Understanding geographical spread through Twitter data

To understand DSI spread in more depth, we analysed DSI-related hashtags on Twitter. Our findings closely echoed the findings of our analysis of the digitalsocial.eu database.

The analysed tags were #civictech, #collaborativeeconomy, #creativecommons, #crowdfunding, #crowdsourcing, #digitaldemocracy, #digitalhealth, #DSI, #edtech, #fablab, #govtech, #makerspace, #opendata, #openhardware, #openscience, #opensource, #sharingeconomy, #techforgood.

We found that the UK, followed by France, used our selected DSI hashtags most frequently, together accounting for nearly two thirds of the tweets collected. Spain, Germany and Italy were also relatively frequent users of these hashtags, with between five and ten per cent of collected tweets coming from each of these countries. Belgium, the Netherlands, Sweden, Ireland and Finland each accounted for around two per cent, while Austria, Denmark, Greece, Poland, Luxembourg and Portugal combined accounted for the remaining four per cent. Our sample contained no tweets from the other eleven EU member states,[71] most of which were located in Central and Eastern Europe (CEE).

Figure 4: Percentage of tweets including DSI-related hashtags



Which social challenges are DSI projects working on?

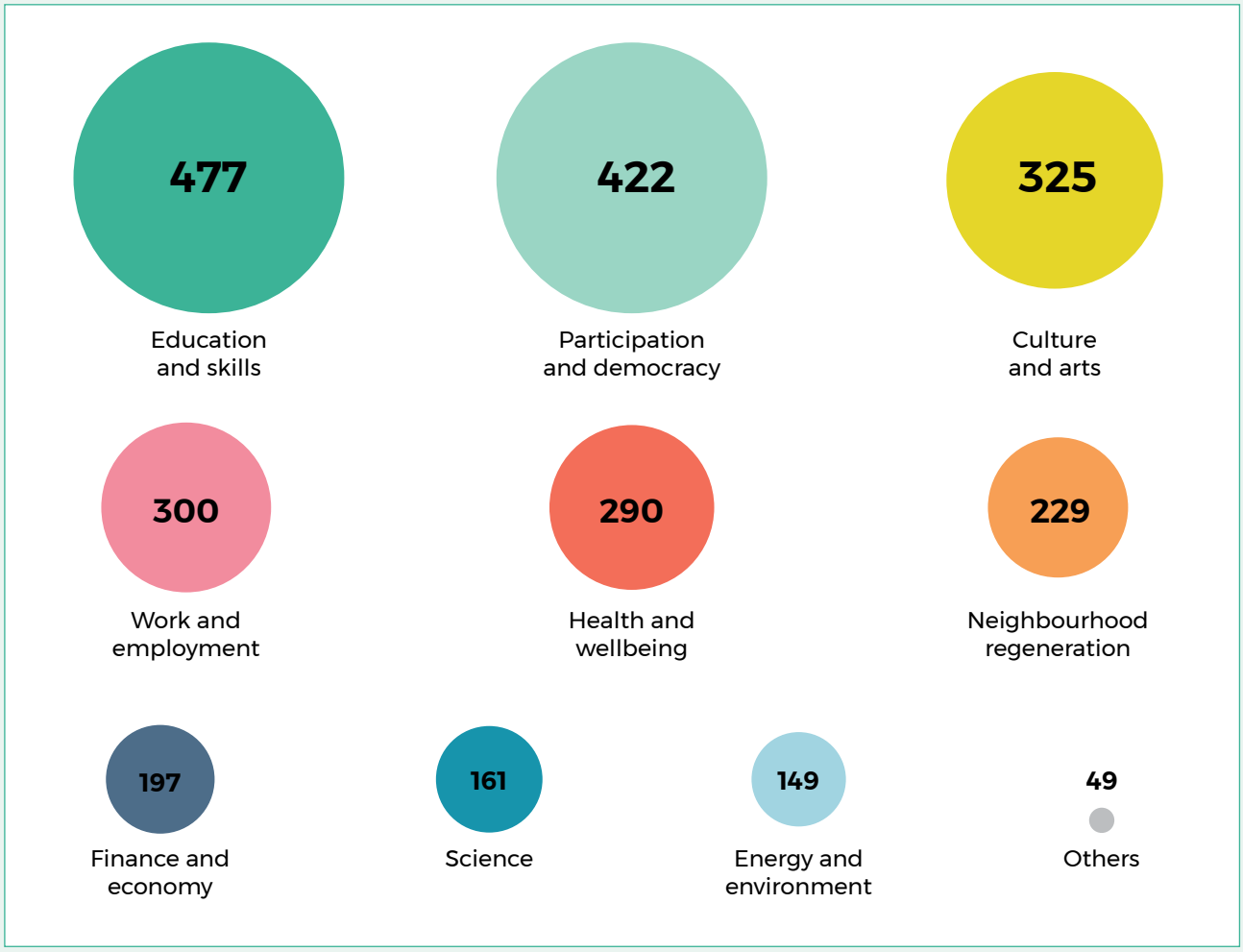
Each project on the platform is asked to define the social challenge it is addressing. Users can group their project in to one or more of nine fixed categories and complement these with free-text tags.[72]

All of the predefined categories are well, if not equally, represented. 'Education and Skills' and 'Participation and Democracy' are the areas in which most DSI activity is taking place, with 475 and 440 projects respectively. 'Energy and Environment' is the least commonly addressed of the nine sectors, with 149 dedicated projects.

Alongside these fixed categories, DSI projects offered 53 unique tags – ranging from 'activism' and 'elderly care' to 'supply chain' and 'youth empowerment' – to describe their area of impact. While a number of these tags seem linked to one of the nine predefined broad areas, it indicates that DSI practitioners use wide-ranging language to describe their work.

Furthermore, the majority of projects (64 per cent) on the platform identified with more than one of our nine categories, while 168 projects (16 per cent) identified with five or more impact areas. This trend is an encouraging sign that DSI is delivering impact in collaborative and multi-disciplinary ways.

Figure 5: Projects on the digitalsocial.eu website by social area

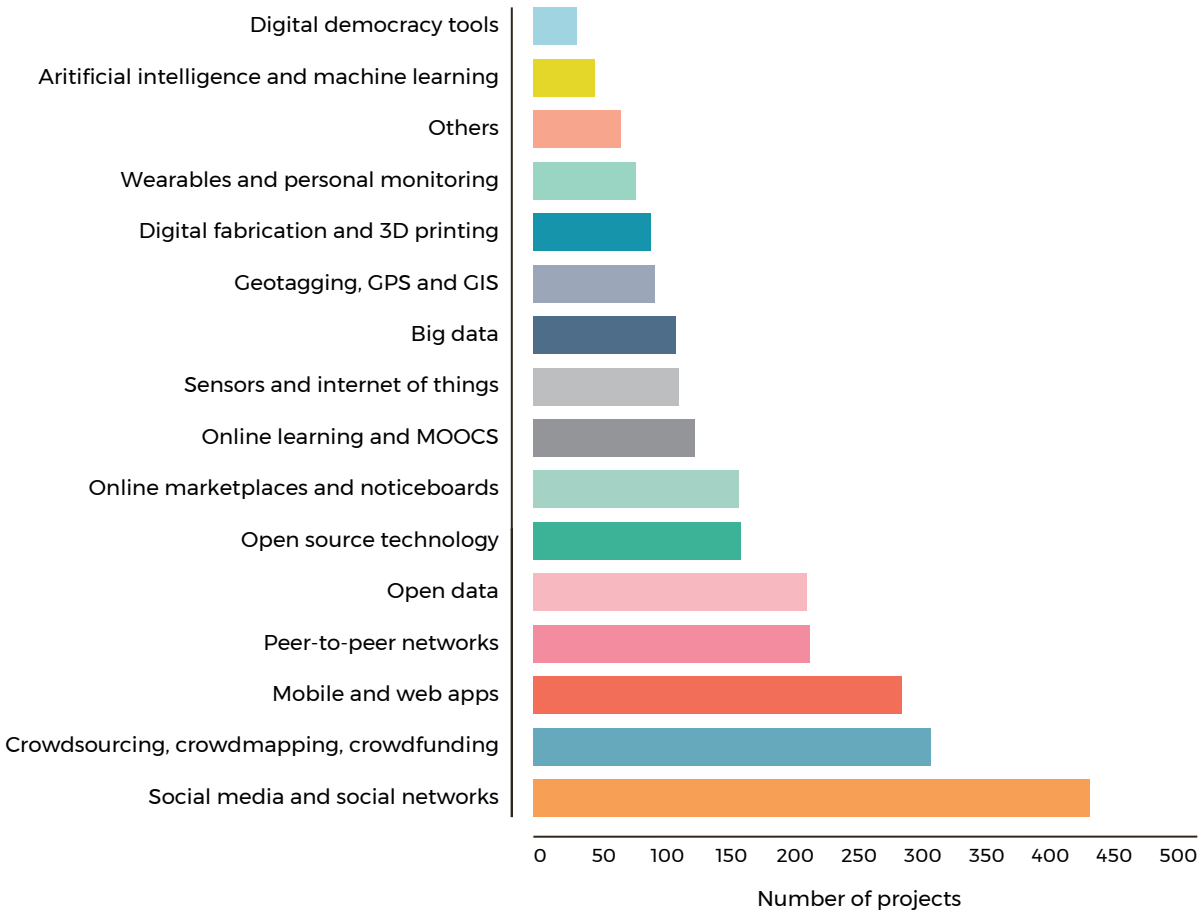


Which technologies are DSI organisations and projects using?

We sought to understand DSI through a set of fixed technology trends: Open Knowledge, Open Networks, Open Data and Open Hardware. We also encouraged people creating profiles to use their own language to describe their projects and organisations with free-text technology tags. As in our 2015 study, the most common trend is Open Knowledge, followed by Open Networks and Open Data, with Open Hardware the least common trend. A significant 43 percent of projects identified with more than one of the four trends.

We can use the free-text tags to understand in more detail the specific technologies used in DSI. Projects on the platform used 108 unique technology tags to describe their projects. Such diversity is also reflected on the individual project level, with the majority (58 per cent) of projects using more than one technology and 28 per cent using five or more technologies. Despite the diversity, as illustrated in Figure 6, there are a smaller number of technologies which are used by a large number of projects.

Figure 6: Technologies used by DSI projects

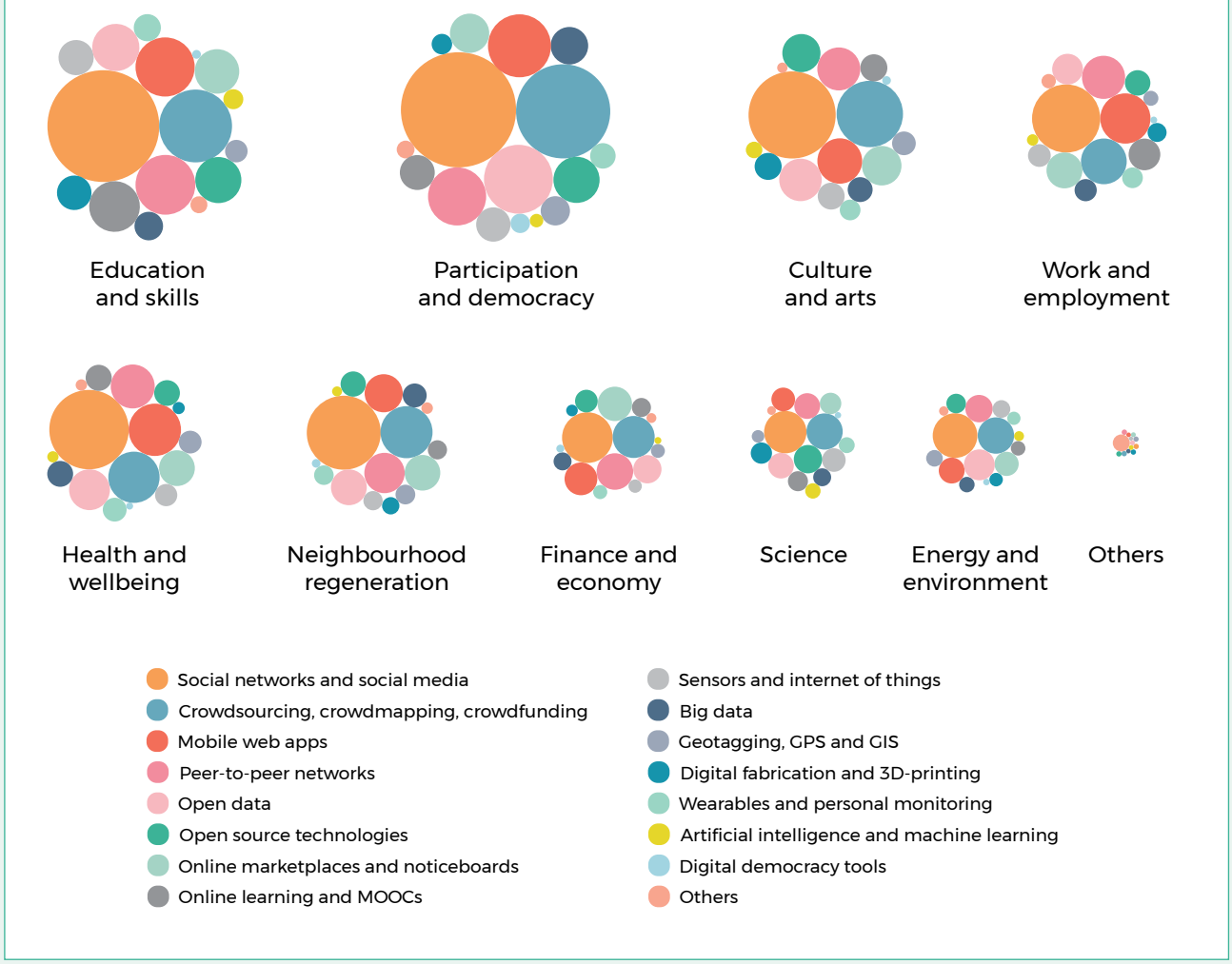


We can see that technology which drives collaboration, or is explicitly outward-looking, is at the heart of most DSI. Specifically, of the four most commonly used technology groups, three directly facilitate and rely on collaboration or network effects (Social Media and Social Networks; Crowdsourcing, Crowdmapping, Crowdfunding; Peer-to-Peer Networks).

Although emerging technologies such as artificial intelligence, machine learning and blockchain are being used by DSI projects, the majority of DSI projects make use of more established - and less 'high-tech' - solutions, such as social networks, crowdsourcing and web or mobile apps. Projects which do employ emerging technologies also tend to rely on established technologies; for example, of the 48 projects using artificial intelligence or machine learning, 28 (58 per cent) also use Social Media and Social Networks. Contrasting emerging and established technology also reveals regional variation: projects which are making use of emerging technology are overwhelmingly based in Western or Southern Europe; of the 48 projects using artificial intelligence or machine learning, very few are based in Eastern or Northern Europe (one and two projects respectively).

Just as we see a diverse range of technology across the field as a whole, we see a range of technologies used in all social impact areas. As shown in Figure 7, each social impact area is addressed using at least nine different technology types.

Figure 7: Number of projects in each social area, sub-divided by technologies used



How connected is the DSI network?

DSI will grow more rapidly if there are more connections between different projects and organisations in the fields. Ensuring different actors – practitioners, funders, policymakers, civil society, citizens – are linked is fundamental for DSI to achieve its potential.

While the digitalsocial.eu database suggests the ecosystem is still highly fragmented, Twitter analysis and the growth of several networks in recent years paint a somewhat rosier picture.

Why are networks important?

Networks are important to growing the impact of DSI for four main reasons:

- **Better co-ordination**. Connected stakeholders are able to co-ordinate actions to address social challenges, to understand how individual interventions affect and are affected by other interventions, to create shared agendas for change and shared measurement systems, and to understand the barriers faced by different stakeholders addressing the same issue. Lack of co-ordination can lead to duplication, which is at best a waste of resources and at worst can cause more harm than good. Somewhat ironically given DSI's basis in the open-source movement, duplication is currently very widespread. The need for networks became obvious during the refugee crisis, for example, when a flurry of activity led to several versions of essentially the same initiatives being developed.
- **Collective intelligence**. Networks enable the flow of information, knowledge and learning between stakeholders. With increased connectivity between stakeholders, access to and provision of collective intelligence increases, enabling DSI to deliver impact more efficiently and more effectively.
- **Collaborative action and collective impact**. Many issues require collaborative action, for example because of their complexity, because they are international (such as climate change or migration), or because they need to be addressed so rapidly (such as responses to natural disasters).
- **More resilience**. Networks are more resilient than individual innovations. Should an individual intervention cease, impact is better maintained in a networked system than if interventions are isolated.

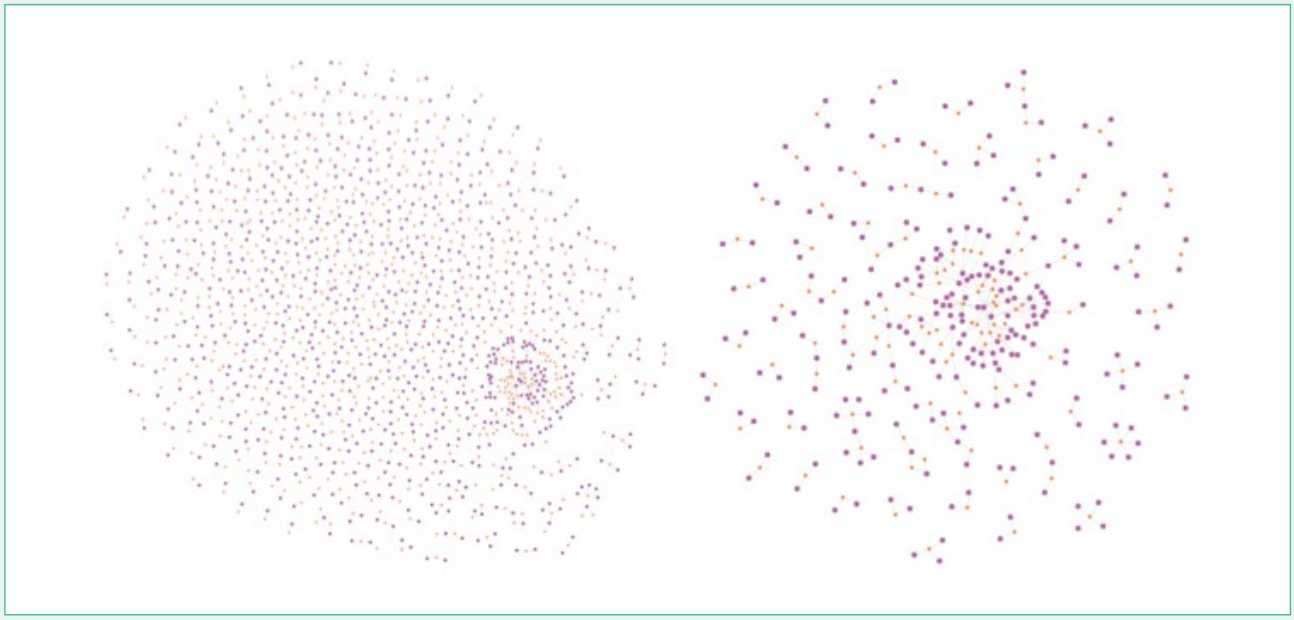
Understanding connections between DSI organisation on the digitalsocial.eu platform

The digitalsocial.eu database shows a highly fragmented DSI ecosystem, although it is not perfect data because organisations and projects are unlikely to update existing profiles as they develop new links and partnerships.

Only 13 per cent of registered projects involve two or more organisations, and only four per cent involve three or more organisations. There are 40 networks (defined as organisations linked through a project) on the database made up of 236 unique organisations. This means that only 19 per cent of organisations on the database are connected to each other through shared projects.

Figure 8: The digitalsocial.eu network

Organisations are in purple and projects in orange. The left-hand network shows the whole database, while the right-hand network shows only organisations connected through shared projects, along with those shared projects.



Using Twitter to understand networks and connections

Using a small sample of tweets, we undertook an experimental analysis to understand connections between DSI organisations. While connections on Twitter by no means suggest that the organisations share a common viewpoint, much less that they are actively collaborating, we believe this is a useful first step to understand networks in new ways.

The DSI organisations we analysed are reasonably well connected. All twelve are followed by at least one of the other twelve organisations. Three of them (Nesta, DSI4EU and Open Knowledge International) are followed by seven or more of the other eleven organisations.[73] On average, each of the analysed DSI organisations is followed by four of the other analysed organisations.

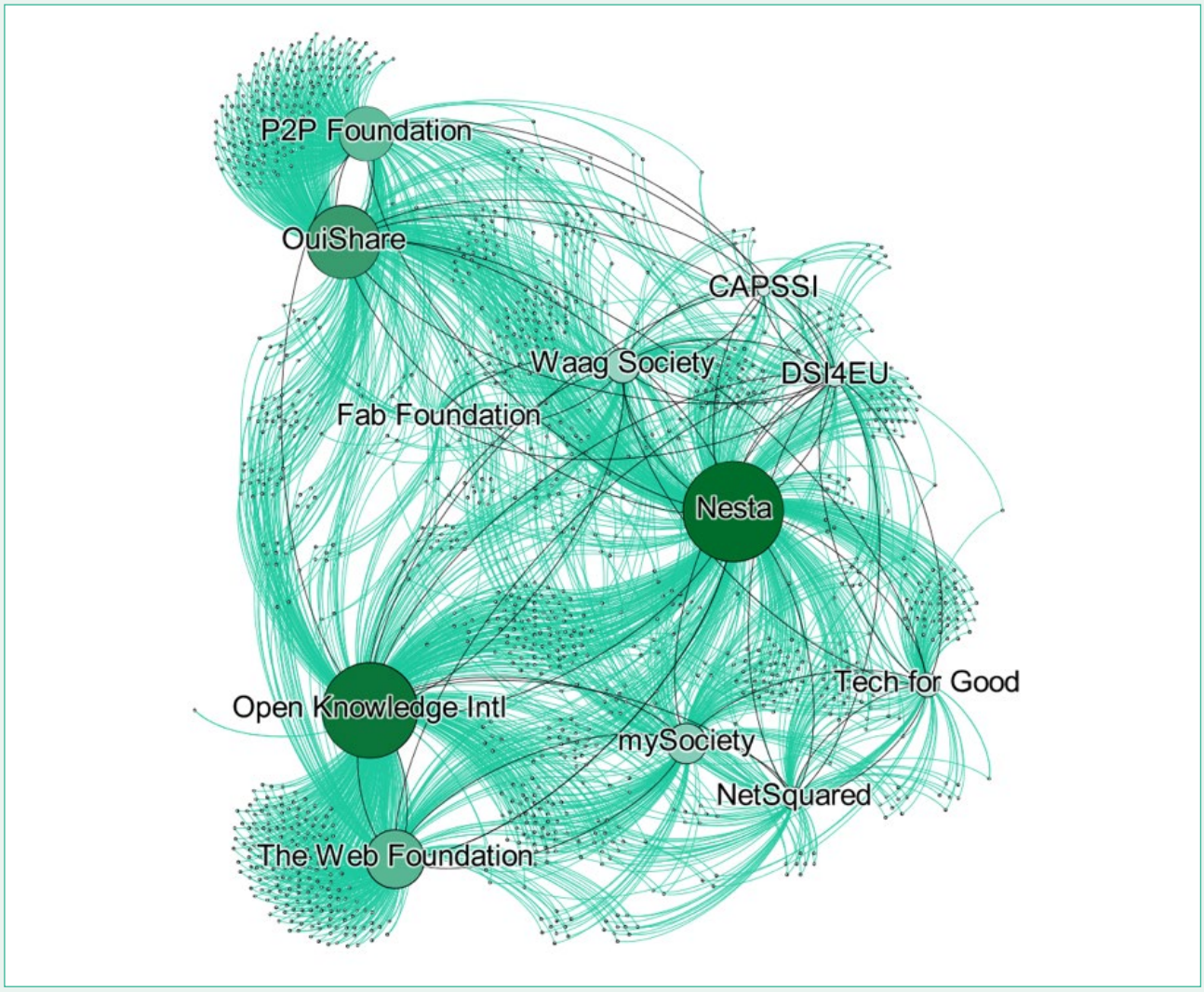
We also analysed the number of shared followers for these organisations, which

may indicate common areas of work. We found, for example, that OuiShare and the P2P Foundation (both of which work on collaborative societies) shared many followers, as did Open Knowledge International and the Web Foundation (both of which work on democratising access to knowledge and open data). Shared followers can also help us identify other organisations or individuals that have an interest in DSI, and who thus may be interested in the work of DSI4EU or even be potential collaborators.

In this pilot analysis we only looked at a sample of twelve known DSI organisations and ten per cent of their followers. Future work could extend this to study all organisations on the digitalsocial.eu platform and collecting all of their followers. In addition, we only looked at who the selected DSI organisations are followed by, rather than who they follow. Doing this would enable us to further understand mutual connections and mutual interests.[74]

Figure 9: DSI organisations mapped on Twitter

This diagram shows how twelve DSI organisations are linked to one another. The black lines indicate organisations following other organisations on Twitter, while the green lines show where organisations are linked through mutual followers. The nodes are arranged so that more connected organisations are closer to each other.



European networks supporting connectivity

In recent years, we have seen encouraging growth in links and partnerships between DSI organisations. Organisations across Europe have begun to bring together those working on particular social challenges or working with particular technologies. These networks carry out a broad range of activities including events, knowledge-sharing, showcasing, research and policy work, and public engagement. We explore a selection below.

Furthermore, as DSI develops and funders, policymakers and civil society become more aware of DSI and associated fields (even if there is a long way to go), examples of projects developed collaboratively between organisations are emerging. For example, the ParlData[75] project is assessing, improving and using data from ten CEE countries and is led by a partnership of seven organisations. EU funding mechanisms, which require multiple partners, are one contributing factor to this increasing collaboration.

Barriers to network-building

Even taking the more optimistic picture, there is still much to be done to build better networks of DSI. Network-building is currently being held back by four main factors:

- **Desire to build networks**. A large amount of DSI and open-source work takes place at a low level, by so-called 'free innovators' and groups working to address personal and very local challenges.[76] The potential of network-building is not necessarily clear to these groups, and the ambition to grow impact through collaboration is not clear.
- **Awareness and visibility**. Secondly, due to the low level at which much DSI is born and the lack of awareness and skills relating to communications (explored in Section 3), most initiatives have relatively low visibility among policymakers and in the media. This means it can be difficult for those interested in DSI to find potential collaborators, a barrier which the digitalsocial.eu website is designed to address.
- **A collective voice**. Given the diversity of the field, its youth, the lack of financial resources and the low level of much activity, there is no body or association representing and connecting DSI practitioners, as many other industries and sectors have. This is perhaps unsurprising; significant and well-developed sectors like commercial digital innovation and the creative industries have only begun to organise clusters, membership bodies and lobby groups in the past five years.
- **Political and institutional support**. Public funding for network-building, which has been forthcoming for commercial and digital innovation, has not been used for building DSI networks. In the UK, for example, the Knowledge Transfer Network (KTN) links up businesses, universities, funders and investors, and is publicly funded through Innovate UK, while TechCityUK, which engages in learning and support programmes, events and policy work, is funded through the Department for Culture, Media and Sport.[77] No similar network exists for DSI at national or EU levels.

Building better networks is fundamental to the growth of DSI. Acting alone, organisations and projects will not be able to deliver impact at a scale which matches the social challenges we face today. Furthermore, the other barriers explored in this report, such as funding, skills, procurement and commissioning, are dependent on better connections between different stakeholders in DSI. In a field where collaboration and participation is understood as central to success, rather than a threat, there is a pressing need to develop a more networked DSI ecosystem in the coming years.

Bringing the DSI community together: European networks

Across the continent, there are several examples of organisations bringing together different stakeholders in DSI. We call these 'network nodes'.

Some of them take broad approaches to the field as a whole, such as Nesta, the UK's innovation foundation, which holds events, produces research and guides and convenes stakeholders, or the Waag Society, which has become a hub in Amsterdam for events and workshops and runs educational programmes and an active fablab. The betterplace lab,[78] based in Berlin, carries out research, events and programmes, such as the betterplace storytelling lab,[79] an 18-month learning program for NGOs on the topics of storytelling, campaigning and advocacy, and the trendradar,[80] a searchable database of DSI accompanied by an annual report looking at the big emerging trends in technology and its social applications. As the refugee crisis grew in 2015, betterplace also began to put together a database of 'ICT for refugees' which now contains over 130 initiatives. The European Network of Living Labs (ENoLL),[81] the federation of certified living labs, now counts 170 active members, including in 20 EU states. While Living Labs are not wholly technologically-focused, the fields they work in, including health, smart cities, e-government and e-participation, mean they are closely linked to DSI.

More informal events organised through the meetup.com[82] platform have grown massively in the recent years. In the field of DSI, the London-based Tech for Good Meetup[83] has over 5,000 members and holds events every two months at which practitioners, funders and other stakeholders can meet. The NetSquared network, which originated in the US, is made up of community-organised meetups for socially-oriented practitioners to learn about digital technologies, from the simplest to the most cutting-edge, in cities across Europe. Facilitated by the TechSoup Europe, which is based in Warsaw, it has a strong presence across European countries and in smaller cities as well as the most prominent urban hubs of DSI.

Code for All[84] is another successful growing network of organisations who share a belief that technology can drive citizen engagement in their communities and deliver social impact. Within Europe, member organisations are: Code for Germany, which has established 25 Labs across the country where practitioners meet to develop apps and share knowledge; Code for the Netherlands, which places innovators in government environments for a year-long programme to address a particular challenge; Code for Poland, which facilitates discussion and co-operation, builds up the knowledge base and deploys apps and websites; and Code for Romania, which aims to empower IT-savvy volunteers to create digital tools to deliver social impact.[85]

FabLab Barcelona

Other network nodes focus on specific social areas. TransparenCEE,[86] an initiative started by the ePaństwo Foundation and TechSoup Europe, documents and catalogues transparency and accountability projects in Central and Eastern Europe. TransparenCEE offers tools, news, analysis and events to bring together the community. The NHS Hack Day network[87] runs hackathons across the UK three or four times a year to bring together innovators in the field of health to develop new ideas for digital products.

Finally, a number focus on particular technologies and technology trends. For example, in the field of making, the Fab Foundation[88] - the global network of fablabs - provides resources, research and news to makers around the world. It also carries out and supports educational initiatives, has developed a growing list of 'fab projects', and organises the annual FAB conference.[89] In 2014 the Foundation launched an online social network, fablabs.io,[90] which maps all fablabs globally, is growing a directory of the fablab tools and projects, and provides forums for discussion.

In the field of data, the Open Data Institute,[91] founded in 2012, works with commercial and non-commercial organisations and governments around the world to provide leadership, develop strategy, carry out research, offer training, influence policy, support startups, create global networks and organise events. The Responsible Data Forum[92] is a partnership between nine organisations which seeks to engage activists and organisations who are using data to better understand and strengthen responsible data practices, through events, facilitating discussion, testing and developing tools, and carrying out and sharing research.

OuiShare Fest Paris 2016

Elsewhere, the P2P Foundation[93] and OuiShare[94] seek to bring together the community of those interested in peer-to-peer practice and the collaborative economy, through events, research, content production and producing databases of initiatives.

Finally, in the field of open knowledge, Open Knowledge International[95] brings together a worldwide community of people who believe that open knowledge can empower, facilitate collaboration, increase understanding of our world, challenge inequality and hold the powerful to account. Through an international network of over 40 chapters alongside the central organisation, Open Knowledge carries out research, collaborative projects, policy work and training and education. In 2016 alone, it was involved in collaborative projects with over 20 organisations, including the Global Open Data Index, School of Data, OpenTrials, OpenSpending and Open Data for Tax Justice.[96]

Understanding DSI in Europe: Five key lessons

1. **There is a huge amount of DSI activity going on in Europe**. We have crowdmapped almost 2,000 organisations and over 1,000 projects working on DSI - and, in reality, even more people beyond our database are part of the movement. DSI is taking place across different social areas and using a range of technologies, especially collaborative technologies.

2. **DSI activity is not evenly distributed across Europe**. There is a concentration of activity in Western and Southern Europe, especially the UK, France, Italy, Spain, the Netherlands and Germany. By contrast, there is less activity in Eastern and Northern Europe and particularly little activity in the Baltic countries and Balkan countries. This is not because of a lack of appetite for DSI among citizens, but rather because of a lack of support (as explored in following sections).

3. **DSI is particularly active in cities**. Due to the density of people and assets and the particular social and environmental challenges present in cities, DSI has taken off most successfully in urban areas. In Europe, cities like London, Paris, Amsterdam, Barcelona and Berlin are hotbeds of DSI.

4. **Stakeholders in DSI need to be better connected to each other**. Our analysis has found that, despite some progress led by network nodes across Europe, stakeholders in DSI are not well-connected enough. Strong and diverse networks are essential to the growth of DSI, and must be supported and facilitated if DSI is to deliver impact at scale.

5. **We can use new methods to understand DSI activity**. Beyond our database, we have experimented with using a small sample of Twitter data to understand in more depth the geographical spread and connectedness of the DSI ecosystem in Europe. Mapping methods such as scraping of social media, job adverts and open data should be further investigated as a means of measuring and understanding DSI activity.

SECTION 3: FROM THE PERIPHERY TO THE MAINSTREAM: BARRIERS TO THE GROWTH OF DSI

While the amount and quality of activity in the field of DSI has grown significantly, we are still far from making the most of the opportunities it presents. There are dozens of inspiring stories, but relatively few examples of DSI moving from the periphery to the mainstream of how our societies address social challenges.

Based on a review of the limited research and grey literature on DSI and over 30 interviews with DSI practitioners, funders, policymakers and experts, this section explores the barriers holding back the growth of DSI and identifies characteristics of successful DSI initiatives.

This section is divided into two main parts. In the first part, we explore barriers related to the system (or macro) level: funding and investment, skills, adoption by the public sector and civil society, regulation and infrastructure. In the second, we explore those related to the project (or micro) level, such as engagement, sustainability, impact measurement and growth strategies.

Growth or scale of DSI?

Social innovation theory provides two main frameworks for understanding growth:

- **Scaling**, defined as *"the process of increasing the impact a social-purpose organization produces to better match the magnitude of the social need or problem it seeks to address."*[97] This is by far the dominant framing in social innovation studies today.[98]
- **Diffusion**, defined as *"the process by which innovation is communicated through certain channels over time among the members of a social system."*[99]

While research and terminology around scaling and diffusion are useful to our understanding of DSI, neither of them are sufficient, and so we use the term 'growth' in this report to better encompass the breadth of routes and approaches to increasing impact.

Scaling theory is particularly useful for understanding the different ways in which impact can be grown. However, its relevance to DSI is limited for three reasons:

- **Firstly**, one of the biggest challenges in scaling social impact - that of growing impact by a greater magnitude than organisations or operations - is not as big a challenge for digital innovations, where a lean and high-performing technology can enable massive growth with little organisational growth. GitHub, for example, has grown exponentially from 100,000 users in its first year of operation (2008-2009) to 10 million users while maintaining a relatively small team of under 600 people,[100] while the Wikimedia Foundation employs just 200 people despite being a source of information for billions.[101]
- **Secondly**, scaling theory takes an individualist approach, focusing on the growth of individual organisations, and does not account properly for routes like open-sourcing which are important in DSI. For example, the Your Priorities platform developed by the Citizens Foundation is often used without its original developers even knowing; as its co-founder Gunnar Grímsson told us, *"lots of projects at grassroots level begin, and we notice afterwards. Sometimes, people speak to us before, as they did in Estonia. In other cases, it gets into the news before we know about it, as it did in Romania."* [102]
- **Thirdly**, the individualist approach prevents us from paying full attention to how different interventions and policies interact with one another and can collaborate to achieve greater impact.

Diffusion theory, on the other hand, is useful to understanding the growth of DSI because it recognises that spreading an innovation is a highly social process (which is particularly important to DSI, given its reliance on participation and collaboration). More importantly, it reminds us how innovations are adopted by different sections of society. This is important for DSI, because the late majority and laggards (often those most excluded from society) may well be those who have most to gain from adopting DSI approaches, and stakeholders must put particular effort into engaging those groups. However, diffusion theory has shortcomings because very little social innovation-specific theory exists, and because it suffers from pro-innovation bias.[103]

Growth through open-sourcing: Precious Plastic

Precious Plastic[104] was founded by Dave Hakkens in 2013 as part of a graduation project. Over the next two years, four machines were developed which put the power of recycling plastic into people's hands all over the world. The projects stated mission is to *"allow people anywhere in the world to transform plastic waste into valuable things"*.

The Precious Plastic machines are completely modular and open-source. They are developed using basic tools and materials and all the blueprints are shared online for free. This way, people anywhere in the world can start their own plastic recycling workshop. Alongside the blueprints, Precious Plastic provides guides and videos to help people build their machines. It also hosts a community website[105] where users can find news, forums and help and share their creations.

This open-source model of growth has enabled Precious Plastic to grow considerably in a short space of time. There are 40,000 members of the online community, 10,000 of whom are active, and at least 36 machines worldwide.

However, it also poses its problems for traditional methods of growing social innovation. Because it is open-source, Precious Plastic cannot easily track who is building machines across the world or effectively measure the project's impact. Open-sourcing also makes income generation difficult.

A Precious Plastic machine.

Because traditional models are unviable for Precious Plastic, and because the challenges around demonstrating impact can make it difficult to access funding, the project currently relies on volunteers and community contributions and is exploring alternative models for sustainability.

For example, it launched a 'Money & People' campaign in early 2017, seeking financial and skills donations to develop the next steps of the project. These include developing a starter kit for beginners, tutorials for using recycled plastic, a more advanced community platform and an open-source business plan for people who build machines to earn money from them.

A selection of products made using plastic recycled with Precious Plastic.

Supporting the growth of DSI at the macro (ecosystem) level

This section explores enabling conditions and barriers to growth at the system level, namely in the fields of funding, skills provision and uptake of DSI by the public sector and civil society. The DSI ecosystem is still in its relative infancy, but we have identified several examples of pioneering practice, from the German government's Prototype Fund to the City of Barcelona's strategic approach to DSI, and from the founding of incubators and accelerators to the development of stronger networks focused around particular themes and technologies.

By exploring and learning from some of the most common barriers to the growth of DSI, and how they have been addressed, we are able to offer policymakers, public sector practitioners, funders and civil society organisations insights and recommendations to support the growth of DSI and thereby begin to address some of the major social challenges we face.

The DSI Fair in Rome, 2017, brought together many of the projects funded under the European Commission's CAPS programme.

Funding

Despite some significant developments, access to funding remains one of the greatest challenges for DSI practitioners. The clear picture from this research is that there is not enough funding for DSI, especially at particular stages of innovations' development and in particular regions of Europe, and that funding is too often inflexible and inaccessible.

Funding is a prerequisite for any venture to grow and to grow its impact. Therefore, we call upon existing funders and investors from all sectors to learn from best practice to address funding barriers, and for funders not currently not active in the field to recognise the importance and potential of DSI. As well as increasing the flow of funding for DSI, it is equally important that issues around geographical spread, funding stages and accessibility and flexibility of funding are addressed.

Developments in funding

In recent years funding of DSI and similar fields has increased across Europe (and worldwide) from different sources. But there is still a large gap between the funding available and what is needed for DSI to grow, and funders and investors are still working out exactly how to fund DSI.

Grant funding

Grants play a vital role in supporting DSI, supporting high-risk early-stage R&D and sustaining projects while they grow user bases, iterate and develop their products and services, and prepare for investment readiness. As we argue later in this section (p.99), grant funding is also essential as a long-term source of funding for DSI projects which deliver impact but for which market models are unviable. Challenges and prizes also support initiatives in their early stages and provide an incentive and funding for DSI projects which cannot be funded through market mechanisms.

In **public grant funding and challenges**, DG-CONNECT's Collective Awareness Platforms for Sustainability and Social Innovation (CAPS) programme is the largest single initiative for DSI,[106] with a budget of €65 million over three rounds using bottom-up grassroots approaches to develop collective solutions to social and environmental challenges. Horizon 2020 has also funded projects like the Open Data Incubator for Europe (ODINE),[107] which provides up to €100,000 equity-free funding and mentorship to companies using open data and has so far accepted 57 startups;[108] and DECODE,[109] a major project developing tools for data commons and data sovereignty. Initiatives below the European level include the £415,000 (€490,000) Open Data Challenge Prizes,[110] funded by the UK Department for Business, Innovation and Skills, and Germany's €1.2 million Prototype Fund,[111] funded by the Federal Ministry of Education and Research.

The Open Data Challenge Series.

The number of **philanthropic and charitable foundations** active in DSI has also grown considerably, although the landscape is more developed in the US than in Europe. Some leading examples of funders are Nominet Trust, which has invested over £25 million (€30 million) since 2009[112] in supporting UK-based ventures using technology for social good, the Open Society Foundations,[113] which support civil society initiatives focusing on accountability and transparency, and the Omidyar Network,[114] which has invested in organisations such as mySociety, the ePaństwo Foundation and Open Knowledge International.[115] The private sector has begun to fund DSI, tech for good and civic tech, including Google (for example through its Google Digital News Initiative and Google Impact Challenge), Telefónica (which funds the Data Transparency Lab and associated Grants programme) and Microsoft.[116] Finally, we have seen collaborative funding models emerge bringing together different sectors, such as the Irish Government and Google's co-funding of the €1 million THINKTECH fund or USAID, UK aid, Omidyar Network and Sida's co-funding of the Making All Voices Count initiative.[117]

However, DSI funding is still not mainstream. The public sector across Europe is still focused on funding commercial innovation, although some countries have public innovation funds with stated social missions (such as Vinnova[118] and Sitra[119] in Sweden and Finland respectively). Most philanthropic funders and most of the private sector are not as active in the DSI as they could be, even though in many (but by no means all) cases it could support them to deliver their goals more efficiently.

Impact investment and venture capital

Impact investment, through which investors seek a social or environmental as well as financial return, has grown rapidly since the term was first used in 2007.[120] As a source of finance, it is relevant to DSI initiatives which have a market-based business model. While the impact investment market is now worth almost €80 billion worldwide, there is no data on how much is invested in technological approaches to delivering social impact, although the fact that a mere two per cent is invested in the ICT sector indicates it is very low. Furthermore, impact investment is not focused on Europe: only 17 per cent of assets under management are in Europe, Russia and Central Asia combined.[121]

Nevertheless, within Europe there are a number of impact investment funds. Many invest in digital ventures, although none invest exclusively in digital innovations and none use the term 'digital social innovation'. European impact investment funds include Nesta Impact Investments,[122] Mustard Seed[123] and Big Issue Invest[124] (all UK), Creas[125] (ES), Caisse Solidaire[126] and Citizen Capital[127] (FR), Kois Invest[128] (BE), Quadia[129] (CH) and Triodos[130] (NL).

A few of the Europe's impact investors, including those which support technology-driven organisations.

As in the case of public funding for DSI, the amounts invested by the private sector are very small compared to the amounts invested into commercially-driven digital innovation. There are no figures for private investment into DSI, tech for good or civic tech, but we can say with some certainty that it is far less than the €10.9 billion of venture capital invested in European startups by the private sector in 2016.[131]

Funding across Europe

There remains a significant disparity in funding and support opportunities across Europe. The UK, for example, has a maturing landscape of philanthropic funders and impact investment, followed by other countries in Western and Northern Europe. Despite engaging with the DSI community in CEE countries, we have found few examples of public, private or philanthropic funding for practitioners. Stakeholders in countries including Estonia[132] reported very limited funding for DSI in their regions, while Krzyzstof Izdebski of the ePaństwo Foundation told us: *"There is no ecosystem supporting DSI understood as the nonprofit environment for civic good."* [133]

Funding DSI at different stages

Just as improving access to different forms of finance is important, so is ensuring that this funding is available and adequate at different stages.

As in the world of commercial startups,[134] there is a well-known 'gap' in funding for (digital) social innovation initiatives between the seed and Series A investment stages (typically in years two-to-four).[135] This is partly because funders tend to want to support either 'brand new'[136] ventures or more developed ones delivering social impact at scale and financial returns. In the case of DSI, however, it is also a result of the way in which DSI initiatives grow exponentially, which means they often 'underperform' against linear expectations in the early years (as discussed further below). One example of a funder specifically offering funding at this stage is Nominet Trust (UK), whose grantees have working prototypes and need to develop these, refine their product and develop a user base.

Accessibility and flexibility of funding

Just as important as the availability of funding is that it is accessible and meets the needs of DSI practitioners. Too often, this is not the case.

Many funding sources require applications which take significant time, expertise and money to put together. (Accessing EU funding, in particular, was considered difficult by interviewees.) In other cases, funding requires ventures to have specific legal statuses or prevents individuals from accessing money, or is only allocated to specific projects rather than core running costs. And, across the social sector, funders' interests and priorities can influence organisations' activities at the expense of really listening to the people and communities they are serving.[137] This poses a particular problem in DSI, which cannot exist without buy-in from citizens.

As noted by Shift Design's Nick Stanhope, *"investment in social technology delivers a fraction of its potential impact during its development stages [...] Pretty much all of the value accumulates as they scale and grow, which may be many years into the business plan and development roadmap."*[138] This means not only that traditional measures of impact and KPIs are inappropriate, but also that funding is a larger risk because if the initiative does not succeed a lot of money will have been spent for very little impact.

However, over the past years we have seen several initiatives which seek to bring flexibility, openness and innovation to the field of grant funding in particular.[139] These include increasing participation at all stages of the grantmaking processes, matchmaking services and support organisations to facilitate collaboration and bid-writing, blended funding, opening up of grant data and matched crowdfunding. We outline a number of these below.

Innovative funding mechanisms

A number of innovative mechanisms have emerged in recent years which aim to open up grantmaking and better support social purpose organisations.

The German Prototype Fund[140] was designed to open up funding to individuals and small teams, and to reduce bureaucracy in the application process, in contrast to the majority of public funding in the country. Run by Open Knowledge Germany with funding from the Federal Ministry for Research and Education, the Fund will offer €1.2 million over three years to around 40 projects developing open-source tools and applications in the fields of civic tech, data literacy, data security and more. The first round, held in 2016, received 500 applications and 17 projects went on to receive up to €30,000 each as well as coaching and mentoring.

With the aim of opening up grant processes to the public, the US-based Wikimedia Foundation, which gives out $2 million (€1.8 million) in grants annually, opens grant proposals it to peer review, which serves as a powerful intermediary between grassroots organising and traditional and institutional donors, functioning as a learning hub for institutional donors and participants.[141]

Collaborative funding is another innovative method of grantmaking. The Fund for Shared

A poster and calendar produced to promote the Prototype Fund.

Insight,[142] for example, is a partnership between 30 foundations which aims to pool financial and other resources to improve philanthropy, establish feedback loops and share knowledge and learning.[143] In other cases, initiatives have sought to support grantseekers themselves to be more collaborative. For example, London Youth Foundations,[144] developed by the London-based John Lyons Charity, are local authority-based membership organisations open to any group working with children and young people in the local authority area. This allows them to build consortia and share learning to increase their chances of accessing grant funding.

The Spanish open-source crowdfunding platform Goteo has been a worldwide pioneer of matched crowdfunding, which involves bringing together institutional funding with funding from the crowd. Goteo has now run twelve matched crowdfunding campaigns with organisations including the Gipuzkoa regional government, the International University of Andalusia and the Europeana Foundation. Through these campaigns, €286,000 has been made available to organisations using the crowdfunding platform.[145]

Promotional image for one of Goteo's matched crowdfunding initiatives.

Skills

Just as with other sectors of the economy, ready access to skills is a necessity for DSI to succeed, but there are shortages in two key areas. Firstly, we look at the shortage of digital skills: this is a structural problem which is affecting the continent beyond the field of DSI. Secondly, we look at business skills: this is a problem of developing practitioners' own skills and providing better ways for them to access specific skills when needed. As shown below, many initiatives are already working to address these challenges - some of which can be said to be working at scale - but more must be done.

Digital and technological skills

Why is there a need for digital skills?

The need for digital skills comes from three factors:

- **Firstly**, even though the initiators of most DSI initiatives are relatively highly-skilled in digital technologies,[146] they often have difficulty accessing other people with those skills as they grow. Furthermore, technological advances necessitate a broader and deeper range of digital skills in areas like coding, data and cybersecurity, which in turn requires access to people with skills beyond an original founder or small team.
- **Secondly**, alongside 'traditional' DSI practitioners there is a large pool of people with great ideas but without the digital skills to bring their ideas to life. They need to be able to access digital skills. Jess Stacey of social tech accelerator Bethnal Green Ventures told us that some members of their cohorts have been led by people from outside the digital world, who have struggled to access digital skills: *"Sole founders often find the journey difficult, particularly if they don't have technical expertise."*[147]
- **Finally**, as discussed later in this section, there is an acute shortage of digital skills in the third sector, which again prevents ideas for DSI initiatives being turned into a reality.

Growing the pipeline of digitally-skilled labour

By some estimates, the EU28 could face a gap of 500,000 skilled ICT workers by 2020.[148] As governments and industry across Europe have woken up to the shortage of digital skills and the consequences this is already having for economic growth, the public, private and third sectors have begun to deliver a range of activities and policies to build the pipeline of digitally-skilled labour.

The majority of these do not focus on social impact, but any growth in the provision of digital skills will have a positive impact on the growth of DSI. Governments have implemented strategies such as including computing and coding on national curricula, as England did from 2014 onwards,[149] reforming curricula (such as the Programma Il Futuro programme in Italy[150]), and forming alliances (such as the European Commission's Digital Skills and Jobs Coalition,[151] which brings together member states, companies, social partners, non-profit organisations and education providers to tackle the lack of digital skills in Europe).

A laser-cut sign advertising the educational programme of Barcelona's Ateneus de Fabricació.

Building on this, different parts of the DSI community have also launched initiatives to build digital skills including:

- **Educational programmes** based in schools (like Code Club[152] in the UK, CodingMasters[153] in Poland, Code for All[154] in Portugal, ProgeMasters[155] in Estonia or #SuperCoders[156] in Belgium, France, Italy, Poland, Romania and Spain), outside schools (such as Hungary's summer camps for disadvantaged children, Erzsébet Camp[157]), online (like General Assembly[158] and Fab Academy[159]), and in fablabs and makerspaces (like Amsterdam City's scheme to offer workshops in five municipality libraries,[160] Barcelona's Ateneus de Fabricació[161] or the Roma Makers educational programme[162]);
- **Skills programmes for groups underrepresented in the tech world**, namely women, such as 23 Code Street;[165]
- **Skills programmes for upskilling disadvantaged groups** such as unemployed people and refugees, such as Hack Your Future[163] in the Netherlands and Crescere[164] in Digitale in Italy;
- **Events** to raise awareness and incentivise activity, such as European Maker Week,[166] EU Code Week[167] and various Maker Faires;[168]
- **Funding programmes** such as the Digital Makers Fund,[169] a partnership between Nesta, Autodesk and Mozilla Foundation, which granted digital making organisations with a total of £500,000;
- **Low-cost and accessible hardware kits**, such as those made by Arduino,[170] Technology Will Save Us,[171] Kano,[172] Yibu[173] and the Raspberry Pi Foundation,[174] and associated resources and media such as Make Magazine[175] and the MagPi.[176]

Many of these initiatives have grown significantly in recent years; there are almost 6,000 Code Clubs in the UK supporting 80,000 children,[177] while the Raspberry Pi has sold over twelve million units since launching in 2012.[178] Some countries have far less activity, however, and certain groups – such as women, ethnic minorities and people with disabilities – are still underrepresented in the digital world.

Refugees learning coding at a Hack Your Future class.

Accessing digital skills

Access to digital skills is often prohibitively expensive for DSI initiatives, both on a contracting and hiring basis. Meanwhile, volunteer labour, while extremely valuable, can pose problems around quality control and reliability for DSI initiatives (especially if offered on an ad-hoc basis), and requires significant co-ordination efforts. This has led to the development of innovative models for organisations to access digital skills and develop their own, some of which are outlined below.

Improving access to digital skills

A number of projects and organisations are now supporting DSI initiatives and civil society more widely to access digital skills and develop their own digital skills.

For example, DataKind[179] is an international organisation with chapters in five countries including the UK and Ireland. DataKind links up data scientists, working on a voluntary basis, to build algorithms or predictive models with social purpose organisations to increase social impact. The programmes are tailored to the needs of the social purpose organisations and range from one-off events to projects lasting several months. DataKind also organises informal community events for data scientists and civil society practitioners to meet one another, and the UK chapter has developed a Data Maturity Framework[180] for the social sector.

The Engine Room[181] is an international non-profit organisation which supports organisations, activists and other social change agents by showing how to make their data and technology more impactful. Based on the premise that not every organisation can have an in-house technical capacity, it offers direct support in understanding data and technology, convenes people online and offline for knowledge-sharing and networking, and carries out research into tools and methods for data and technology for social change. The Engine Room is also a partner, alongside eight other organisations, in the Responsible Data Forum,[182] which supports activists and organisations to strengthen responsible data practices. The Forum also holds events, facilitates discussions and disseminates information, and remains a proponent for improving the way advocates work with data.

Toolkits and guides have also been developed to equip DSI and civil society practitioners with digital and data skills, including the open-source Platform Design Toolkit,[183] which is offered alongside consultancy and workshops, and the Open Data Institute's guides to open data.[184] Finally, the School of Data,[185] a network of 14 member organisations and 104 active individuals, offers 44 learning modules so that civil society organisations, journalists and citizens to learn the skills they need to use data effectively. So far, over 6,000 people have been trained through School of Data.

A workshop on citizen-generated data run by The Engine Room.

The Platform Design Toolkit.

Business skills

Digital innovations do not grow spontaneously, however good their technology. Just as central to growth are business skills including networking and relationship-building, user and market research, communications and marketing, accessing funding, strategic planning, legal and financial knowledge and often (for better or worse) a charismatic 'salesperson'. There are two avenues for tackling this shortage: firstly to upskill practitioners themselves, and secondly to provide better access to others with those skills.

Case studies and interviews with DSI initiatives which have successfully grown, and intermediaries supporting DSI, highlighted a number of areas where skills are at a particular premium.

Communications and marketing. As DSI is based upon participation and relies on network effects, growing the user base is essential to creating and growing impact, and concerted and targeted communication is needed to achieve this. Unfortunately, planning and delivering these communications requires time and skills which DSI practitioners, especially in their early stages, often lack, exacerbated by the fact that many practitioners underestimate the need to invest in communications and marketing work.

Business planning. As discussed later in this section (pp.94-99), our understanding of growth and sustainability models for DSI is relatively undeveloped, as the field is young and the prevalent business models of commercial industries are often not appropriate for DSI. Many practitioners do not have the skills for business planning and partnership building which are needed for growing initiatives and putting them on the path to sustainability.

Partnerships. DSI practitioners have been relatively slow to build long-term partnerships with other organisations who can support the growth of initiatives, such as established CSOs, government and the private sector. This can be because practitioners do not understand the importance and potential of partnerships; because they have difficulty meeting the right people; or, in some cases, because they are suspicious of working with bodies who may not share their values. One organisation we interviewed believed it was difficult to partner with the third sector and private companies because *"for them, it's all about marketing"*. However, some organisations have developed excellent partnerships: open-source crowdfunding platform Goteo, for example, has developed programmes with regional governments and charitable institutions, while uMotif, which developed the 100 for Parkinson's app to crowdsource data for research, harnessed the networks of large CSOs to reach thousands of people.[186]

The power of business skills: CitizenLab

CitizenLab[187] is a civic engagement platform for citizens to co-create their cities. It offers governments, mainly local authorities, a platform for engaging their citizens in local decision-making.

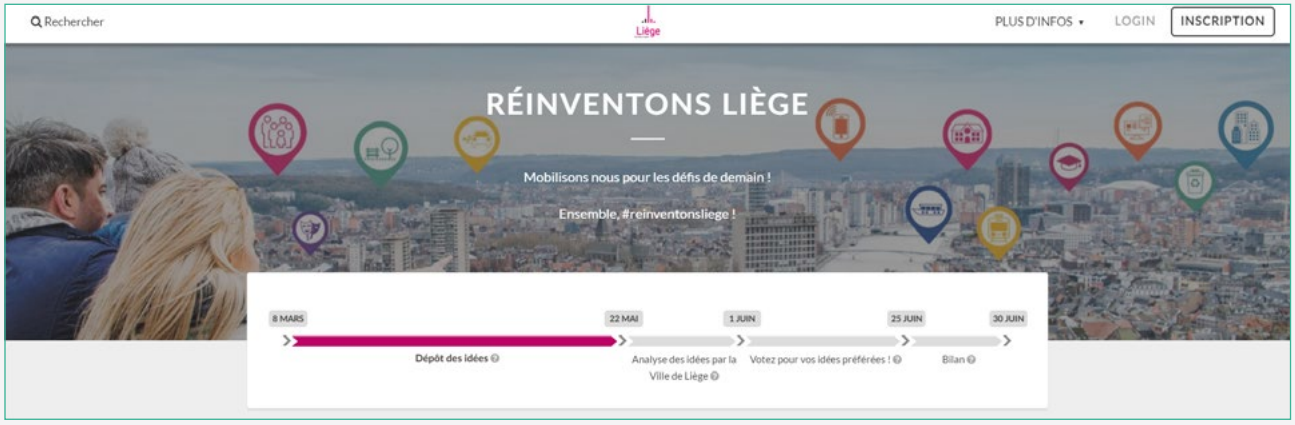
The CitizenLab logo.

In just over a year since the first pilot, CitizenLab has grown rapidly. From working with the City of Hasselt, which was seeking to consult citizens on plans to redevelop a local park, the organisation has grown to count over 30 clients in Belgium and the Netherlands, as well as the federal government in Denmark and the Flemish and Walloon regional representatives in the Belgian capital.

This is in no small part due to the team's strong business skills; two of the three co-founders have degrees in business management. The team devotes significant resource to communications, including having one full-time member of staff dedicated to storytelling, maintaining an active blog, and gaining a lot of press coverage.

CitizenLab has also developed a sustainable business model. CitizenLab was originally incubated with €25,000 from the Belgian incubator iMinds (now imec), and has since raised €500,000 in investment and €50,000 from the EU's Horizon 2020 programme. This is in part because, unlike many civic participation platforms, CitizenLab is a for-profit company with an embedded social purpose. It offers software-as-a-service (SaaS) to governments, charging an annual subscription fee which varies depending on the services and functionalities used and the size of the city. The platform offers functionalities such as provision and visual representation of data, toolkits and guides which aim to organise the whole process in order to create internal efficiencies.

The decision to work with government as the main client makes CitizenLab financially viable and offers strong growth perspectives in the long run. But, recognising that this top-down approach, working mainly with policymakers and civil servants, could benefit from complementary bottom-up approaches, CitizenLab will soon allow citizens to unlock their own cities on the platform. In cities using the platform, citizens can already now put topics on the council's agenda and unlock the discussion once they have reached a critical number of votes. In this way, CitizenLab seeks to empower both governments and citizens and to bridge the gap between them.

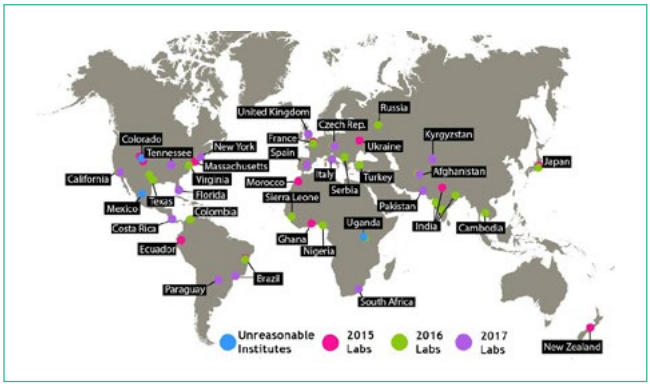


The CitizenLab platform deployed in the Belgian city of Liège.

It is also important to note that many digital social innovators have no ambition to grow or scale their project. Many practitioners are so-called 'free innovators', people who develop their projects with a purpose to serve a very local or personal need. As a result, the people or organisations behind the project often do not have ambitions to expand and scale the initiative to other users or new markets. One possible way to address this, discussed by Von Hippel, is for government and funders of DSI to invest in marketplaces and diffusion activities, and where possible to support collaboratives rather than individual innovations.[188]

As the need to develop business skills has become clearer, one of the most important sources of support has been incubators and accelerators. Building on the rapid growth of incubators and accelerators in the commercial sector, we have seen several emerge which focus on social technology. While these sometimes provide grant funding or investment, perhaps the most value they offer practitioners is in their programmes of mentoring, events, workshops, business training and networking.

Examples of incubators and accelerators in fields similar to DSI include Bethnal Green Ventures and DotForge in the UK;[189] Le Social Good Lab[190] and La Social Factory[191] in France; the pan-European Impact Hub Network's Scaling programme;[192] NESsT in Poland and Hungary;[193] the Unreasonable Institute, which runs on a franchise model enabling associated organisations to launch their own accelerator programme after receiving the necessary training and support, and has so far run European accelerators in the Czech Republic, France, Italy, Russia, Serbia, Spain and Ukraine, with further programmes taking place in the United Kingdom in 2017;[194] and the Norrsken Foundation in Sweden.[195]



A map of Unreasonable Institute programmes worldwide

However, this is a small growth compared to that of commercial accelerators. As an example, recent work by Nesta identified 530 incubators and accelerators in the UK, of which only 33 (six per cent) labelled themselves as having a social focus (respondents were not asked whether they had a specific technology focus).[196]

Other initiatives for upskilling social organisations include intermediaries between investors and entrepreneurs, such as ClearlySo,[197] which supports social entrepreneurs to develop their business skills before linking them to potential investors. ClearlySo supports social organisations' capital-raising activity through financial advisory work and introduces them to institutional and individual investors who share their objectives and values. ClearlySo also offers business strategy, PR, business planning, financial modelling, investment structuring, due diligence, investor negotiations, and deal closing. Since its founding in 2008, ClearlySo's clients have raised £115 million (€135 million).

Support is also offered to DSI practitioners in the form of online resources, handbooks, toolkits and guides available for social innovators, such as the DIY Toolkit, the BENISI Scaling Guide[198] and the 100%Open toolkit.[199] However, we have not come across any toolkits or guides focusing exclusively on DSI, and the focus on market-based entrepreneurship in existing toolkits may limit their value for some DSI practitioners.

Finally, initiatives have emerged linking practitioners up to others with business and support skills. Nominet Trust has a partnership with The Media Trust through which grantees can access communications support, and also offers discretionary bursaries of up to £5,000 (€6,000) so that practitioners can access specific expertise in law, finance and administration.[200]

The growth of these intermediary organisations supporting business skills for social innovators is welcome. However, until now they have paid limited attention to DSI, and the majority of activity has taken place in the UK and, to a lesser extent, France.

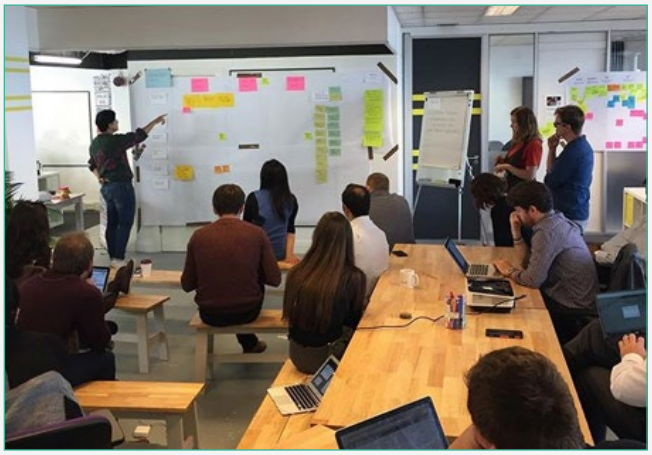
Accelerating social technology: Bethnal Green Ventures and La Social Factory

Bethnal Green Ventures[201] (BGV) was Europe's first 'tech for good' accelerator. It has its origins in a series of 'social innovation camps', sponsored by Nesta, which took place between 2008 and 2011 bringing together developers, designers and engineers with people who had a deep understanding of social problems. Five camps were held in the UK as well as 25 in other countries.[202]

After the success of these camps, BGV was created with funding from Nesta, Nominet Trust, Blackstone Charitable Foundation and the UK Cabinet Office. The accelerator programme takes cohorts twice a year of roughly ten early-stage ventures using technology for social good. They receive £20,000 (€23,500) in return for six per cent equity (previously £15,000 (€18,000)), as well as access to office space and a three-month programme of workshops, connections, mentoring and a demo day at the end to present their ideas.

Since the first cohort in 2012, BGV has invested £1.4 million (€1.7 million) in 86 startups. It currently has 56 startups in its portfolio which have raised a total of £23 million (€27 million) between them, and which are estimated to have benefited over 6.5 million people. Notable alumni include Democracy Club, which supports voters to access information, Firesouls, an online exchange bringing together government suppliers and local civic projects to create social value, and Fairphone, the world's first ethically-sourced smartphone.[203] In March 2017 BGV received a further £1.3 million (€1.5 million) to grow its activities.[204]

Another example is La Social Factory,[205] a Paris-based incubator. Founded in 2013, it offers very early stage organisations and individuals educational programmes, the ability to prototype ideas and an incubation programme. It has supported 59 organisations and offered over 1,000 hours of mentoring.



A cohort workshop at Bethnal Green Ventures.

Bethnal Green staff with their Fairphones. Fairphone took part in the accelerator programme in 2012.

DSI and the public sector

The public sector and governments at the local, national and European level are a fundamental stakeholder in the DSI ecosystem, carrying out three main roles: enabler (through policy, funding and support), customer (through contracts and procurement) and partner (through strategic deployment of DSI tools, products and services).[206]

However, the public sector and governments have been slow to engage with DSI, which has hindered the growth for the field. In this section we explore these barriers further in terms of partnerships and procurement. Infrastructure and regulation is addressed later in this section (pp.66-75).

Why is the public sector so important for DSI?

The public sector is a fundamental stakeholder in the DSI ecosystem. Most, if not all, initiatives interact with, benefit from, or are held back by the public sector's actions, initiatives and policies. The public sector can play three main positive roles in the growth of DSI:

- **Enabler**. State institutions can enable the growth of DSI through building digital infrastructure, ensuring a favourable regulatory environment, opening datasets, setting standards and providing funding. These functions are explored elsewhere in this section.
- **Customer**. The opportunity for DSI through procurement and commissioning is vast, with public purchase of goods and services accounting for 14 per cent of GDP across the EU.[207] Accessing procurement and commissioning is often the only way in which DSI initiatives are to deliver at scale (particularly in fields where the public sector holds a monopoly, such as in healthcare, education and employment support). In turn, DSI has the potential to enable public services to be delivered more efficiently, and to involve citizens as co-creators rather than just users of services.
- **Partner**. In some cases, DSI can only have impact at all through partnering with public services. The obvious example here is digital democracy; as pointed out by Róbert Bjarnason of the Citizens Foundation, *"If a civic society organisation sets up a participation platform not connected to the government, what would be the point of that? It's just another discussion group."*[208]

Public sector uptake of DSI: proZorro[209]

ProZorro is a public e-procurement system in Ukraine which has become a global exemplar of anti-corruption efforts and co-operation between the public and private sectors and civil society.

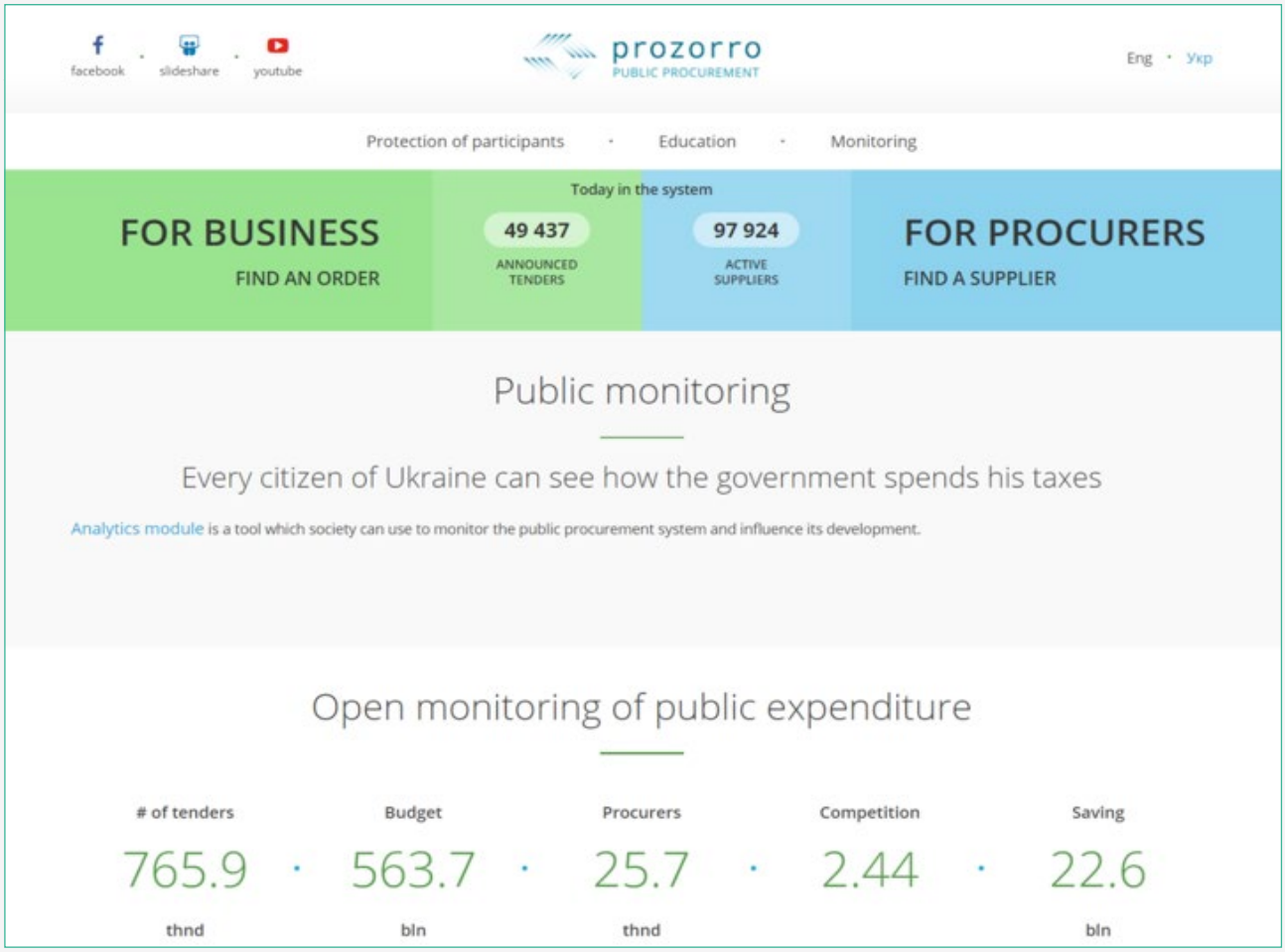
The ProZorro logo.

ProZorro digitises and opens up all the information about public tenders (including the offers put forward by private companies) for anyone – civil society, journalists, the public, business, government – to view. It is fully open-source and conforms to the Open Contracting Data Standard. All data is stored on a central database, but tenders are accessed by potential suppliers through fifteen different commercial marketplaces, a structure which encourages competition further and makes the system financially self-reliant. It also offers tools for analysis and complaints, guides, and training modules.

ProZorro, which means 'transparently' in Ukrainian, was initiated by volunteers in March 2014 and first deployed in a non-governmental capacity less than a year later. Only a month later, members of the team were invited by the Ukrainian government to lead the national public procurement department. Less than two years later, more than 3,900 governmental organisations had joined the pilot project and saved more than UAH 1.5 billion (€52 million) in a country where UAH 50 billion (€1.8 billion) is lost annually to corruption in public procurement. As of April 2017, 764,000 tenders worth UAH 561 billion (€19 billion) had been awarded through ProZorro, saving UAH 23 billion (€800 million). It has also allowed Ukraine to become a signatory to the WTO Agreement on Government Procurement, making it easier for foreign bidders to submit bids.

In the past year, the project has been expanded to cover all Ukrainian procurement and the platform, previously hosted by Transparency International, has been migrated to the Ukrainian government's servers. In August 2016 it became mandatory for all public contracting entities to use ProZorro. The Ukrainian government was supported by the European Bank for Reconstruction and Development to draft the necessary legislation.

As well as being an exemplar of public take-up of DSI, ProZorro is working with the Open Contracting Partnership (OCP) to measure its impact rigorously, developing a public Theory of Change and Monitoring, Evaluation and Learning Plan and sharing results on a regular basis. Initial results show that between January 2015 and March 2017, the average number of bids per tender rose 15 per cent



The ProZorro monitoring platform.

and the average number of unique suppliers rose 45 per cent, both indicating increased competition. This in turn led to almost ten per cent savings on procurement by participating authorities in a country where government spends 45 per cent of its budget on procurement. A survey carried out by USAID found that 80 per cent of entrepreneurs believed the system partially or significantly reduces corruption. Citizen engagement has also increased; the accompanying DoZorro monitoring platform has been viewed by over 60,000 Ukrainian citizens.

Barriers to take-up of DSI by the public sector

The public sector has historically lagged behind the curve on using digital to deliver services and to change the way it operates internally. Over the past decade, however, govtech, e-government and smart cities have entered the mainstream, and governments have begun to embrace technology for everything from online voting to regulating traffic, from managing rubbish collection to delivering doctor consultations online. Some governments (like Estonia, South Korea and Singapore at the national level, and Barcelona, Amsterdam and New York at the city level) have become particularly well-known and imitated for their e-government strategies.

But this digital revolution has largely remained the preserve of established corporates and has delivered top-down, rather than bottom-up, solutions. At times, this has delivered solutions to problems which don't exist, and not delivered solutions to problems which do exist. Digital government projects should focus more on human-centred, participatory services driven from the bottom-up, delivering real solutions to real challenges.[210]

We have identified five main barriers to uptake and implementation of DSI by the public sector:

Difficulty innovating and experimenting. Size, accountability demands, tight budgets, lack of leadership and cultural and political factors can all hold back digital transformation and innovation in government.[211] In recent years, there has been substantial progress in government innovation, including the development of many government innovation labs[212] (such as Vinnova, Sitra, MindLab[213] and La 27e Région[214] in Sweden, Finland, Denmark and France respectively), projects such as Design for Europe[215] (which creates and shares knowledge, experience and skills to enable design-led approaches in government and business) and Nesta's i-school programme[216] (which seeks to strategically support the people, teams, labs, offices and organisations inside government). However, there are limited examples of the public sector developing the knowledge, skills and processes to make the most of DSI specifically.

Digital skills. Research shows that employees in the public sector and government lack ICT skills and, in some cases, even basic digital skills. In a Deloitte survey of governments worldwide, 90 per cent of public sector leaders said workforce issues were a challenging area for digital transformation and only 33 per cent said their organisation provides the right resources or opportunities to obtain the digital skills they need.[217] As a result, awareness of the existence and potential of digital tools, as well as knowledge about how to use and implement those tools, is low.

LabWorks is a global event bringing together public sector innovators from around the world.

The ODI's Open Data Leader's Network, 2015.

Again, there are some examples of successful strategies for upskilling workforces. The eGovernance Academy,[218] founded in Estonia in 2002, has now trained over 3,000 public sector officials from over 60 countries to use ICT better to increase government efficiency and transparency and to improve democratic processes. The UK set up the Digital Leaders Network[219] in 2012, run by the Government Digital Service, to support the use of digital in government departments, while the Open Data Institute's Open Data Leaders Network[220] brings together people from around the world to share knowledge and ideas, discuss common challenges and best practices and learn from peers. European countries who have taken part include the Czech Republic, Poland, the UK, Macedonia, Spain, Serbia, Ireland, Italy and Ukraine.

Procurement and commissioning. It is notoriously difficult for smaller companies and organisations (and therefore most DSI organisations) to access procurement and commissioning routes – despite the fact that the vast majority of public sector leaders are not even satisfied with their technology vendors, and that 76 per cent of public sector leaders think procurement needs to change to accommodate digital transformation.[221] Recent research by the Spend Network, for example, showed that less than 3 per cent of UK government spending (where the supplier could be identified) went to startups.[222] Many contracts are too large for small organisations to take on by any means:

"The small people can't put in for big contracts. Some type of space is needed for them to be able to compete - for example, spaces to speak to commissioners, or a marketplace for collaborative bids."

Daniel Robinson, Nominet Trust

Cybersecurity is now recognised as a major national threat.

Progress has been made in the field of procurement of innovation in the past decade,[223] using policy instruments, programmes and financial instruments. Some European countries, including Finland, France, Spain, Belgium, Denmark and the Netherlands now have quantitative and qualitative innovation procurement targets, while several governments use tools such as forward commitment procurement (through which governments make the market aware of genuine needs and requirements, and offer to buy products which meet these needs once they are available[224]), pre-commercial procurement (a competitive process of R&D that supports the design, development and testing of new products or services to meet the specific needs of public bodies[225]) and e-procurement. However, again, we have found few examples of procurement strategies focusing on DSI or open-source approaches.

Infrastructure, data and security. Integrating technology into public service provision is complex, requiring new frameworks, data policies and secure internet and data infrastructures, especially for cybersecurity, now considered one of the biggest threats to governments and public sectors.[226] These require time, money and expertise, and, if not implemented well, can lead to hacking attacks, data breaches and reputational damage. These demands and risks can discourage the uptake of new digital technologies.

Political acceptance. DSI allows for new forms of participation and citizen engagement, and has the potential to put significantly more power in the hands of citizens. This entails, or is at least perceived to entail, transfer of power from established authorities to citizens, which is not always welcomed.

In some cases, politicians and policymakers become champions for DSI, as is happening especially at the city level in Europe. In others, governments are unable to ignore DSI initiatives. For example, only months after Safecast began collecting data about radiation in the Washington DC area, the US National Nuclear Security Administration (NNSA) began to open up their own datasets. While this cannot definitively be attributed to Safecast's work, the timelines suggests it had an effect.

Unfortunately, however, these cases of political acceptance remain the exception and not the norm.

Strategic urban approaches to DSI: Barcelona

Cities are hotbeds for DSI. This is unsurprising, given, on the one hand, the density of people and assets, and the presence of civil society organisations, businesses and government, and, on the other, perennial challenges like environment, transport, employment and community cohesion which are only growing as our societies become increasingly urbanised.

While in most cities DSI exists alongside city government, occasionally working together on discrete projects, there are some examples of city governments taking holistic and strategic approaches in order to make the most of DSI. Leading among these has been Barcelona, Spain's second biggest city.

Barcelona and Catalonia (the autonomous region of which it is the capital) have long been a centre for DSI and innovation more broadly; they are home to pioneering organisations like Goteo, Guifi.net and Xnet, and the P2P Value project identified Catalonia as a particularly dense area of commons-based peer production initiatives. Barcelona is also a centre of the maker movement, focused on the FabLab Barcelona, one of Europe's biggest and whose founders have been central to the growth of the fablab movement across the continent. It also has three city-backed makerspaces, called Ateneus de Fabricació, which offer educational, family and social innovation programmes. Barcelona was an early supporter of the Fab City project and the first to sign the Fab City pledge, in 2014.

However, the role of DSI has come to the fore and entered mainstream government since the election of Ada Colau, a former housing activist, as mayor in 2015; Colau herself was elected following a crowdfunded campaign organised through a collaborative platform. The government has focused on major social and economic reforms and the grassroots nature of the project has encouraged participatory innovation in the city.

In June 2016, Colau appointed Francesca Bria (who worked on the first DSI project) to the new role of Chief Technology and Digital Innovation Officer for Barcelona. Alongside this, a Digital Innovation Office and Mayor's Committee on Digital Innovation have been created to align strategic projects with the administration's priorities. The fundamental aim of the strategy is to create bottom-up, rather than top-down, ways of empowering citizens and delivering social change, and to understand how technology can serve people, rather than corporations.

The first step the Office took was to develop a Barcelona Digital Plan, co-created by citizens, academics, makers and the tech

Pilots taking place in the Barcelona Maker District in Poblenou.

community. It sets out the City's aim to reinstate technological sovereignty, allowing government and citizens to set their priorities for how technology can benefit themselves and their communities. This involves regaining control over data and technology infrastructures and involving local SMEs and innovators in developing digital services and solutions. The accompanying Digital Transformation Roadmap sets out a Code of Conduct based on openness, user-centricity and data ethics, and outlines nine priorities grouped around the themes of Digital Transformation, Digital Innovation and Digital Empowerment.

One strategic DSI project is the creation of DSI4BCN, building upon the DSI4EU project, which will map DSI and fund initiatives which use free, open, decentralised and privacy-aware digital technologies to address social challenges. Another is the launch of the Barcelona Maker District. This will be established in the previously-industrial Poblenou district, which was regenerated into an innovation district in the 1990s. It will facilitate community-led initiatives linking universities, research institutions, makerspaces and fablabs, social businesses, citizens and social movements. Furthermore, the city has launched the Make in Barcelona brand, which will support Barcelona on its journey to becoming a Fab City, one which is self-sufficient by 2054. In 2017, Barcelona is holding its first city-wide Maker Faire, showcasing over 200 projects and welcoming world-class speakers, with the support of the City Council.

Barcelona has also taken a proactive approach to ensuring citizens' data privacy while also using data for good. The City Data Commons project alongside a new Data Directive seek to ensure citizens have control over their own data, and that data can be used for better decision-making, innovation and citizen empowerment. Barcelona is also one of the two pilot cities for the DECODE project, which aims to develop blockchain-based approaches to personal data protection, and the city is in the early stages of developing platform co-operatives to challenge incumbent collaborative economy platforms.

Barcelona has also used DSI for the running of the city council itself: for example, it recently implemented the Bustia Etica project, which allows for completely anonymous whistleblowing; and it uses the Decidim platform, alongside offline engagement, to facilitate public deliberation and collective decision-making processes. Decidim allows citizens to propose, deliberate and decide on city policies and budget allocation; when used to develop the Government Agenda, over 12,000 ideas were put forward.

Barcelona is not the only city to be approaching DSI in a strategic way. Other cities such as Amsterdam, Milan, Paris, Bologna and Milton Keynes are also implementing strategies to involve citizens in policymaking and developing initiatives, to take advantage of the density of people and assets to build community cohesion and reduce environmental damage, and to deliver a digital economy which works for all.

Ada Colau, Mayor of Barcelona, visits Fab Lab Barcelona.

DSI in civil society

"Digital technology is the most powerful tool for social innovation that we have ever had. Yet despite its undeniable impact on all aspects of our lives [...] its potential still remains largely untapped by established charities."[227]

Dan Sutch, CAST

Until now, DSI has largely been developed and led by small teams and individual 'free innovators'. With some notable examples, adoption by established civil society organisations (CSOs) has been limited.

Technology offers a huge opportunity to CSOs. It allows them to innovate their service delivery at a time of increasing demand due to structural changes and cuts to public services.[228] At the same time, their own budgets are shrinking because of a move away from public grants and towards contract-based commissioning which funds specific services but not core running costs.[229] Finally, DSI allows them to engage their stakeholders not just as donors or service users but also as co-creators, at a time when public trust in the third sector is falling.[230]

Working with CSOs also offers existing initiatives the potential to increase their impact rapidly by accessing large user bases, funding streams, communications and marketing skills and influential policymakers and politicians, as well as an established reputation.

It is clear, therefore, that collaboration between CSOs and existing DSI initiatives is one of the most promising routes to growing impact because of the benefits it offers both parties. It is somewhat surprising, therefore, that it has not happened more.

We have found that the biggest barrier to uptake of DSI within civil society is the shortage of digital skills and lack of digital leadership within CSOs. As a result, CSOs are often unaware of the potential of DSI, unable to develop and implement DSI tools and services, and in some cases are resistant to new technologies.

DSI in established charities: Cancer Research UK and SOS Children's Villages

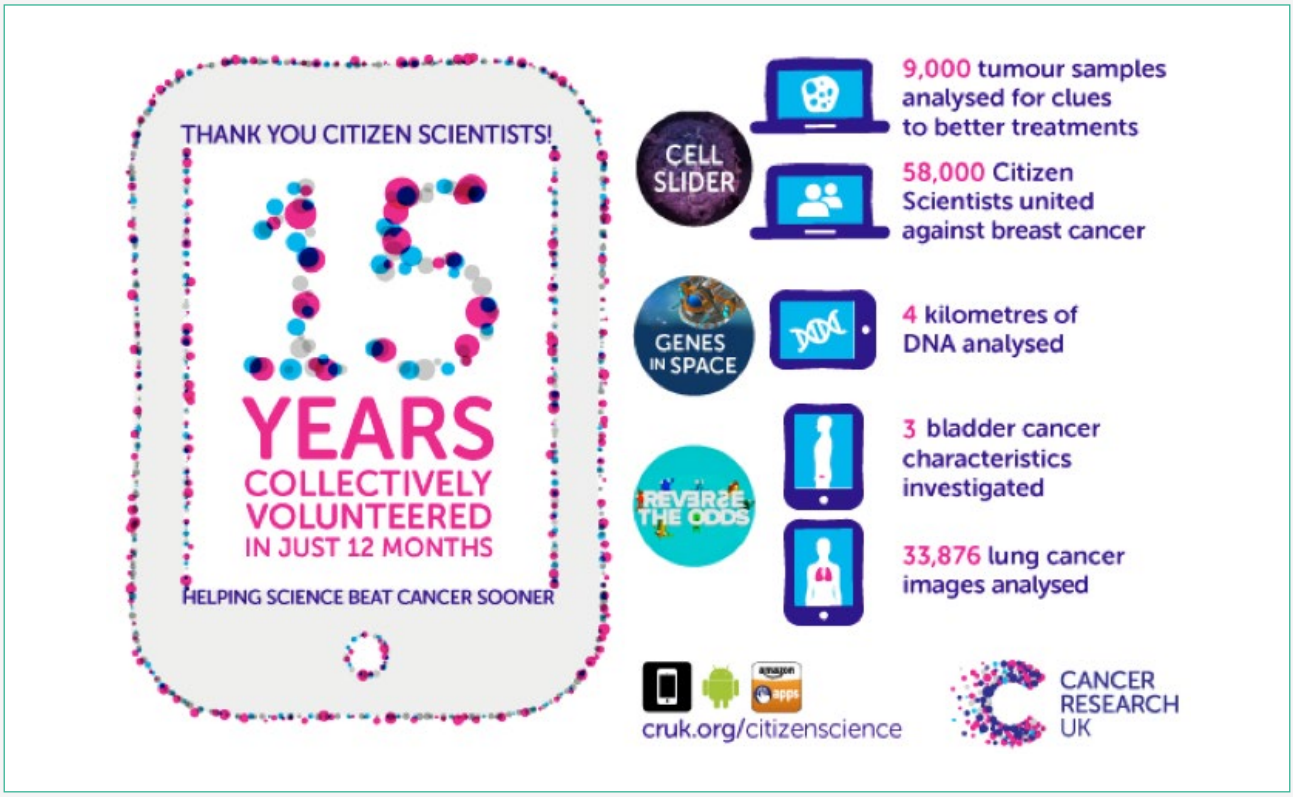
Cancer Research UK is one of the UK's largest charities, with an annual revenue of over £600 million (€700 million), a workforce of over 3,000 and a volunteer base of 40,000.[231]

Cancer Research embarked upon its Citizen Science programme[232] in 2012, seeing that crowdsourcing was growing rapidly as a trend and that it had the potential to speed up research to fight cancer. Originally teaming with leading citizen science organisation Zooniverse, the programme developed a series of games, including Cell Slider, Genes in Space and Reverse the Odds, and incorporated citizen science analysis into the existing game The Impossible Line. Citizens playing these games analysed raw data to be used by researchers. Genes in Space alone was downloaded over 400,000 times and gathered over 4.5 million contributions, providing six months' worth of analysis in just one month. Over the course of the programme, 11 million data annotations were made by 500,000 citizens in 182 countries. The programme won 13 national and international awards. Just as importantly as the research outcomes itself, the scheme showed that citizen science was a valid method of research and laid the foundations for further progress in the field.

Advertisement for Cancer Research's citizen science game Genes in Space.

One of the key success factors identified by the project team was their multidisciplinary nature and autonomy within the larger charity, which allowed them to be more experimental and employ rapid, iterative processes. After their initial work with Zooniverse, in later development the team took the whole process in-house so that they could better respond to the needs of scientific researchers and experiment with different designs and approaches more rapidly and with lower risk and cost. Another important factor was that the games were very high-quality and attracted users for enjoyment as well as social impact. Finally, the charity was able to invest significant sums which smaller charities would not be able to do, and it could draw upon its extensive network and existing communications functions rather than building from scratch.

The project team also identified a number of challenges. Because the team was given a high degree of autonomy, the citizen science programme was not always considered core to the charity's strategy, which meant it was not as high a priority when making strategic decisions. In addition, earlier games produced large amounts of data but this data was not as useful for researchers as the team had hoped. Therefore, in later games, they worked closely with researchers to validate the scientific value of data produced prior to full development. Finally, the two-year timescale for the project was felt to be insufficient, and the team believed a five-year plan would have enabled greater impact and sustainability.



Infographic showing key figures from Cancer Research's Citizen Science programme (2014).

Another example of existing CSOs taking up DSI is SOS Children's Villages. The global charity exists to prevent family breakdown and care for children who have lost parental care, or who risk losing it. SOS has been particularly active in Europe since the start of the refugee crisis. In collaboration with BeeTwo, a Vienna-based social technology firm, and a number of NGOs in Macedonia, Bosnia & Herzegovina, Serbia and Croatia, the charity's Austrian branch developed Toucan, an emergency response app intended to help teams on the ground respond to refugees' needs more efficiently.

The app, which was partially crowdfunded, allows refugees to share real-time information about their situation, while NGOs can share information about resources they have available and coordinate quickly on how best to distribute them using a real-time map of the area. For example, when a refugee goes into labour, Toucan will alert all local medical organisations to help coordinate who will respond, and avoid duplication. The app has been piloted in Greece and the team is hoping to roll it out to other countries in the Balkans, as well as making it available to other NGOs in time.[233]

Toucan helps humanitarian organisations better serve the needs of refugees.

Building digital capacity in civil society organisations

The lack of digital capacity within CSOs is the biggest barrier to adoption of DSI. While there are no EU-wide studies on digital skills in civil society, studies in the UK – one of the countries with the most DSI activity – give an indication of the challenge. One study found that 78 per cent of UK charities invest no money in digitally upskilling their employees, that 49 per cent of charities lack basic digital skills, that 43 per cent do not have a website, and that only 38 per cent use social media.[234] Another found that only nine per cent of charities had embedded digital strategies, and that half had no digital strategy at all.[235] A study on crowdfunding (one of the more accessible DSI tools) found that while 89 per cent of surveyed charities were aware of crowdfunding, only 15 per cent had used it. Those who had not used crowdfunding cited not having the right skills as one of the main factors for this.[236]

Related to this is the lack of digital leadership and awareness about the potential of digital, combined with risk- and innovation-averse cultures,[237] and the lack of complementary skills for DSI such as in methodologies for design, partnership building, product management and evaluation of digital products.[238]

Encouragingly, progress is being made on digital skills through initiatives like DataKind (see p.48), and there is growing awareness of the importance of digital; 69 per cent of UK charities understand digital technologies' potential to deliver strategy more effectively, and 59 per cent are taking active steps to improve culture so that digital can flourish. But we have a long way to go, and must do so urgently; if not, CSOs will find themselves in severe trouble. In the past year alone, some charity leaders have suggested the sector is 'digitally stagnant',[239] and that charities (especially small ones) risk becoming 'obsolete' in a digital age.[240]

What this means for DSI

Despite the potential of DSI, CSOs should only consider taking it up when they have established digital strategies, a workforce with digital skills, and a clear problem which could be tackled better with technology than without it. DSI should be far down the list of priorities for CSOs who lack basic digital skills. CSOs which try to run before walking will end up wasting time and money and risk losing the trust of their staff and the public.[241]

Nevertheless, there is still a need to bring DSI into the charity sector. CSOs beginning their digital journey should bear in mind that DSI is not always complex technology; crowdfunding, social media and crowdsourcing – some of the most common technologies on the digitalsocial.eu site – are relatively simple to use. Meanwhile, CSOs further along their digital journey should explore how more advanced technologies could help achieve their social mission.

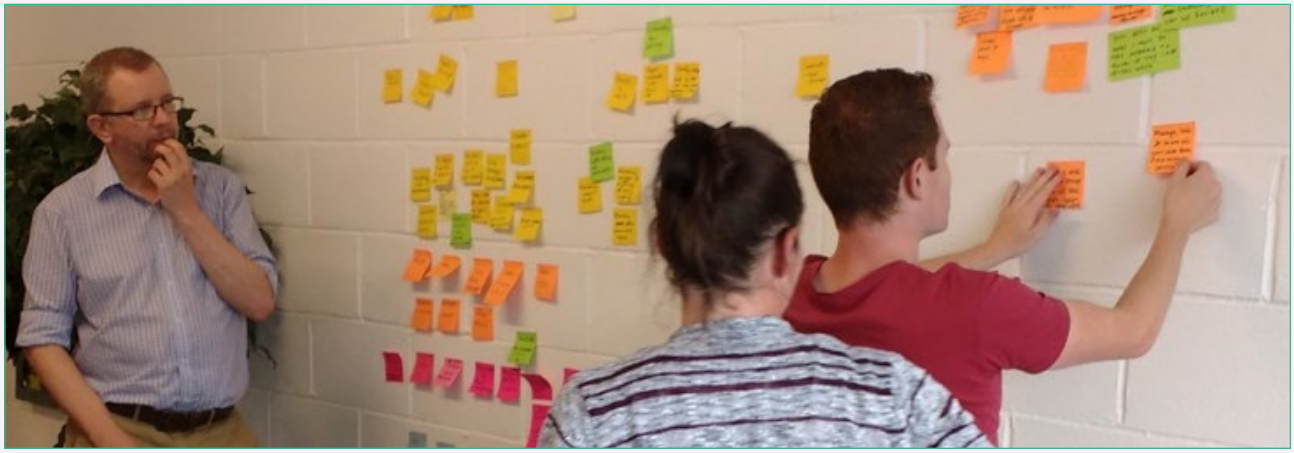
Building digital capacity in CSOs: CAST

CAST (The Centre for the Acceleration of Social Technology) was founded in 2015 to help funders, non-profits, businesses and government put digital at the heart of their service delivery and drive organisational change. Some of their most successful work has been driving the uptake of social technology within existing CSOs.

CAST's Fuse programme is the world's first technology accelerator for established non-profits. Staff from organisations which join the Fuse programme are matched with expert digital teams who support them to prototype, test and develop digital products and services over three months. Central to this process is breaking down silos by involving multiple teams from the non-profits (i.e. not just their digital teams) and developing products and services using a test-driven approach which places users at the heart of development (in practice, from day three of the accelerator programme). The programme also empowers them with a roadmap and skills for the continuation of their work.

Nine non-profits have graduated from the Fuse accelerator, including some of the UK's biggest charities. For example, Oxfam UK's poverty team developed a service that helps people to build an emergency fund for food through their usual shopping habits, while also enabling data collection around food poverty to help Oxfam advocate and campaign for more systemic change. Women's Aid, a national charity working to end domestic abuse against women and children, created an interactive online service for girls aged 14-18 to answer their questions about relationships. Users receive advice and support from experts, young survivors of abuse and their peers to emphasise that they are not alone. Two more organisations are currently involved and Fuse will accept another cohort of six non-profits in 2018.

Alongside Fuse, CAST runs the Digital Fellowship, which works with charity senior leaders and CEOs to help them understand the potential of digital and to implement it in their organisations. The six-month programme consists of eight half-day workshops, through which Fellows learn the essentials of digital development and meet with other leaders in the digital and non-profit sectors. At the end of the programme, charities attend a design workshop at which they put their learning into practice, working with developers to rapidly design and develop a new tangible digital product or service. Over the following week the charities continue to work remotely with the developers to create a functioning prototype, which is further refined in a final week-long sprint. Current Digital Fellows include SafeLives, National Ugly Mugs, Quaker Social Action, Wales Co-operative Centre and Roundabout.



A workshop run by CAST as part of the Digital Fellowship.

Policy and infrastructure

Beyond procurement, partnerships, funding and skills development, government has an important role to play in enabling DSI through infrastructure and policy.

Significant progress has been made in recent years in areas like open standards, open data and personal data protection. However, governments must not become complacent. They continue to be faced with challenges such as increasing internet centralisation, ongoing concerns about privacy and surveillance and the growing risks of cybersecurity. Furthermore, the internet risks becoming not a democratising influence but rather one which replicates and exacerbates existing patterns of inequality, division and oppression. As described in the Web Foundation's recently-published strategy for 2017-2022: *"We must act now to close the divide between digital haves and have-nots or we risk losing the web's potential to serve humanity forever. To do this, we must work harder to ensure that everyone has the access, skills, and freedoms to appropriate and control new technologies for their own benefit. We must also make sure that control of the web is not held by a few governments or companies."*[242]

Concurring with the Web Foundation's analysis, in this section we outline five key areas in which government can play an enabling role through infrastructure and proactive policymaking: digital inclusion, open government, data infrastructure, open data, and personal data protection and identity management.

Digital inclusion

DSI will only reach its potential if digital tools are accessed by everyone, regardless of age, ethnicity, ability, gender, income or location. However, emerging research from the civic technology community suggests that this is not the case, and that digital technologies are replicating or even exacerbating existing patterns of inequality and discrimination.[243]

Access to internet

A prerequisite for DSI is access to the internet. The EU as a whole has made good progress towards the Digital Agenda's 2020 goals for Universal Broadband Coverage (99.8 per cent of EU households have access to broadband), and is implementing a range of initiatives to achieve the Connectivity for a European Gigabit Society goals.[244] There are still significant issues, especially for rural communities: only 27.8 per cent of households in rural areas had access to the latest generation internet in 2015, versus 70.9 per cent for the population as a whole. Furthermore, some countries, such as Italy, Greece and Croatia, are particularly lagging on connectivity.[245]

Digital inclusion

In 2016, only 76 per cent of EU28 citizens used the internet weekly,[246] only 55 per cent had basic digital skills, and a significant minority of 16 per cent had never used the internet.[246] Just as basic digital skills are fundamental to a thriving digital economy, they are key to DSI achieving its potential. If DSI is not within the reach of all Europeans, it will only be able to serve a subset of society and will not shift and distribute power and resources in new ways.

Many initiatives are being carried out by member states, the European Commission and civil society to foster digital inclusion, but we have a long way to go. It is a concern that there have been some steps backwards, such as cuts to lifelong learning budgets at the national level.[247]

At the same time, more must be done to ensure digital technologies are accessible and assistive by using inclusive design methods such as Design for All principles.[248] Some progress has been made in this area, such as the European Parliament's decision in 2016 to require public sector websites and apps to be accessible to people with disabilities.[249]

Citizens learn how to use the Smart Citizen Kit, Amsterdam.

Digital Skills for All: Initiatives to foster digital inclusion

Among the different projects initiated by the European Commission under its 'Digital Skills for All' strategy is the European Digital Skills Awards,[250] held for the first time in 2016. 258 projects entered the competition's four strands (Digital skills for all, Digital skills for the labour force, More and better trained ICT professionals in Europe, Digital skills in education), including 66 in the Digital skills for all category.

A workshop run by Biblionet in Romania.

One example fostering digital inclusion is Biblionet,[251] which has established training centres in each of Romania's 41 country library systems and regional training centres in five county libraries, to provide hardware, software and IT support to over 2,000 libraries. This means that Romanian public libraries are now vibrant community hubs with new services and the ability to teach local residents digital skills.

The UK-based Good Things Foundation[252] is dedicated to building a digitally inclusive society through a range of projects. It delivers a range of digital and social inclusion programmes through the Online Centres Network, which comprises 5,000 community partners (libraries, housing associations, GP practices, churches and so on) and has supported over two million people to gain digital skills since 2010.[253] Projects include

The Good Things Foundation and Online Centres Network logos.

those to empower disadvantaged people to use the power of digital to improve their health and their finances, to find employment, to tackle loneliness and poverty, and to improve community cohesion especially for non-English speakers. The Foundation also carries out research and the annual Digital Nation report and has been pioneering in its implementation of rigorous independent evaluations of its programmes, and in its sharing of findings.

The Cibervoluntarios Foundation[254] supports a network of over 1,500 volunteers across Spain who give time, both online and offline, to share digital skills with those at risk of digital exclusion. The Foundation has built relationships with over 500 grassroots charity associations supporting a range of vulnerable communities, from the elderly and the unemployed to migrants and mental health patients, to enable its group of crowdsourced volunteers to reach those most in need of digital skills development.

Cibervoluntarios volunteers.

Open government

The open government agenda has gained force in the past decade, and particularly since the founding of the Open Government Partnership (OGP) in 2011. The OGP is committed to fostering a global culture of open government that empowers and delivers for citizens, and advances the ideals of open and participatory 21st-century government.[255]

Open government agendas and DSI are closely linked, and both are enablers of the other. They share the key values of involving citizens in government and public services, providing and using open data and data infrastructure, transparency and accountability and collaboration.

The OGP was launched in 2011 *"to provide an international platform for domestic reformers committed to making their governments more open, accountable, and responsive to citizens."*[256] Since its launch with eight founding members, it has grown to include 75 participating countries, each of which has endorsed the Open Government Declaration, developed a National Action Plan, and committed to reporting on progress with their Action Plans. Furthermore, in 2016 the OGP launched a pilot programme involving 15 pioneering sub-national governments. The progress of governments is tracked through annual Independent Reporting Mechanism (IRM) reports,[257] and the OGP organises knowledge-sharing initiatives including workshops, working groups, webinars, multi-stakeholder forums and the annual Open Government Summit. Finally, the OGP has developed an Open Government Toolbox, which contains over 200 use cases, 1,300 tools and 500 organisations for government and civil society practitioners to consult.[258] The open government agenda has also received significant attention from other organisations like the OECD[259] while research has been carried out by organisations like the Brookings Institution.[260]

Only one member state was a founding member of the OGP, but Europe has progressed well since - but more remains to be done. While the majority of EU countries are part of the OGP, six are not,[261] and the European Commission itself has had limited engagement with the OGP.

Data infrastructure

The devices we use every day, from smartphones and laptops to cars and public transport cards, and increasingly our household appliances, are constantly collecting data. It is the raw material that enables some of the world's biggest companies to know us better than we know ourselves, and our city and public service infrastructures are powered by it.

As argued in depth by the Open Data Institute (ODI), data should be seen as infrastructure[262] – the whole ecosystem of data itself, the organisations which publish, fund and maintain data assets, the licenses and standards which are used, and the guides which help us use and manage data. It can be owned by organisations in the private, public or third sector, or by individuals, and allows different sectors, services and physical infrastructures to be connected. Within these data infrastructures sits a spectrum of types of data, from data only available to individuals within an organisation to open data. These data infrastructures power economic growth and foster new kinds of relationships between public institutions, civil society and citizens. As such, they are essential to DSI.[263]

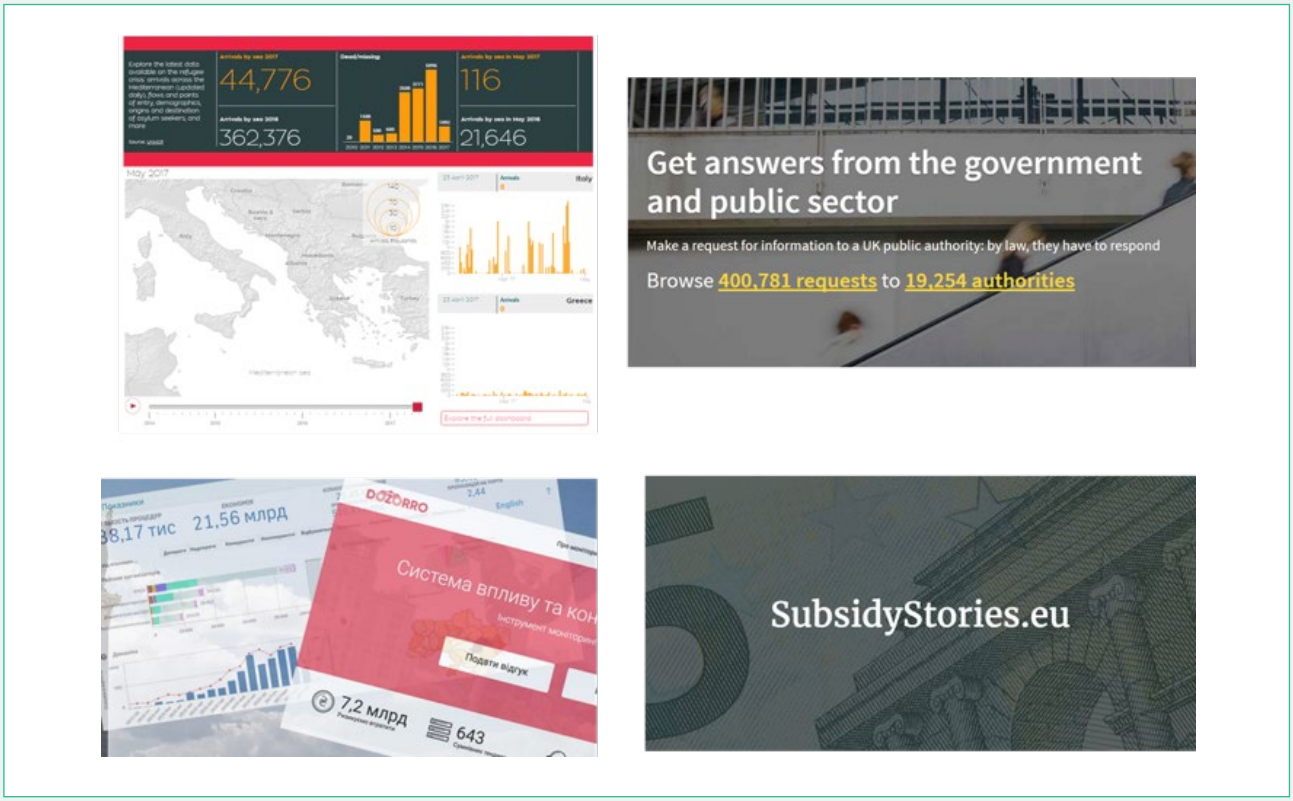
However, governments are not yet fully committed to data infrastructure in the same way as they have been over past centuries to roads, railways, energy networks and water systems.[264] Until now, much data infrastructure has been built by civil society, such as CKAN and the Open Fiscal Data Package (both Open Knowledge International),[265] the Open Contracting Data Standard (Open Contracting Partnership)[266] or the Open Data Certificate (ODI).[267] While these infrastructures should not be the sole responsibility of government, neither should they be wholly civil society-led; collaboration is key. Government commitment to data infrastructure, through legislation and investment, is currently insufficient, and this situation must change.

Open data

Open data is defined as data which *"anyone is free to access, use, modify, and share [...] subject, at most, to measures that preserve provenance and openness,"* [269] and it is particularly important to the DSI community. 37 per cent of projects in our database, for example, report that they use open data.

As in the case of open government, to which open data is closely linked, Europe has led the way globally for the past decade. In the most recent ODIN (Open Data Inventory) survey carried out by Open Data Watch, 17 of the top 20 countries globally for open data maturity were in Europe.[270] But government and open data advocates should not become complacent. The 2015 Open Data Barometer found that progress by traditional open data leaders has slowed, while some less-developed countries – like Mexico, Uruguay and the Philippines – have been progressing in leaps and bounds. Meanwhile, the sobering conclusion by the Open Data Barometer was that *"recognition of data's importance to development is at an all-time high [...] If we allow this moment to slip away, however, open data could fade into a ghost town of abandoned pilots, outdated data portals, and unused apps."*[271]

At the European level, there is significant variation between different countries' open data maturity. The European Open Data Portal project, for example, ranks countries out of a total of 1340 points. The top scorer, Spain, received 1225 points, while the lowest scorers, Liechtenstein, Latvia and Malta, receive zero, 200 and 225 respectively. The same project finds that of 28 EU member states plus Norway, Liechtenstein and Iceland, three are classed as 'beginners', twelve as 'followers', eight as 'fast trackers' and eight as 'trendsetters'.[272] Another project, OpenDataMonitor, finds huge variation not just in the number of datasets (ranging from nine in Croatia to almost 30,000 in Germany) but also in their quality, machine readability, availability and metadata completeness.[273] Regionally, ODIN finds Northern Europe to be the best performer, followed by Eastern Europe, Western Europe, and then Southern Europe.[274, 275]



Clockwise from top left: Open Migration, WhatDoTheyKnow, Subsidy Stories by Open Spending, ProZorro.

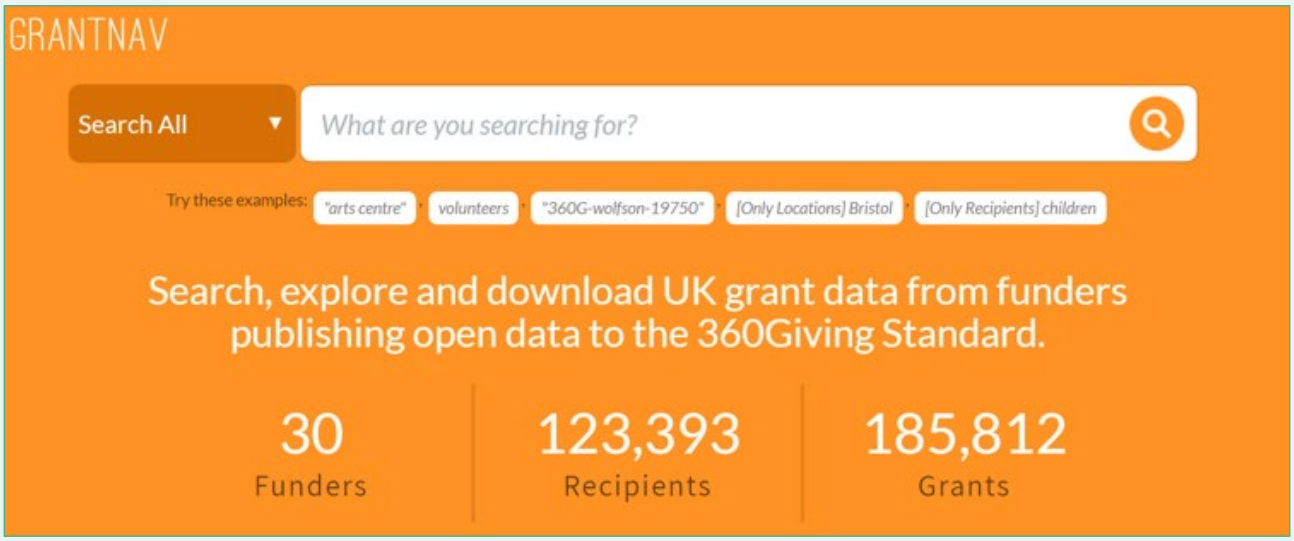
For both high performers and lower performers, a number of barriers remain:[276]

- **Political barriers**: Few countries have open-by-default policy commitments, and there are significant challenges engaging policymakers and politicians;
- **Legal barriers**: Most European countries do not have clear legal frameworks for publishing open data, and few have consistent policies and standards on licensing;
- **Technical barriers**: Almost no countries have quality control processes before data publication, metadata completeness for European open datasets is only 58 per cent, and only 45 per cent of European datasets are machine-readable;
- **Financial barriers**: Some public bodies still charge for 'open' data, while others are reluctant to release open data because it would entail a loss of revenue;
- **Awareness and skills** remain low among public sector workers, civil society and the public;
- **Impact measurement of open data policies** is still very immature and there is no consensus on how to measure open data maturity, as shown by the variations in different rankings.

While the quantity of open data has been increasing massively, its quality has not always done so. This includes intrinsic quality (accuracy, objectivity, reputation of the source), contextual quality (timeliness, relevance, completeness, sufficiency), representational quality (meaning and format) and accessibility (ease and means of access and security).[277] Low-quality open data is of very limited use to DSI practitioners.

Furthermore, some governments have been accused of open-washing, or *"post[ing] what is expedient and noncontroversial while seeking recognition for their proactive disclosure"*.[278] This data is often not the most useful for practitioners and researchers, and holds back the growth of DSI.

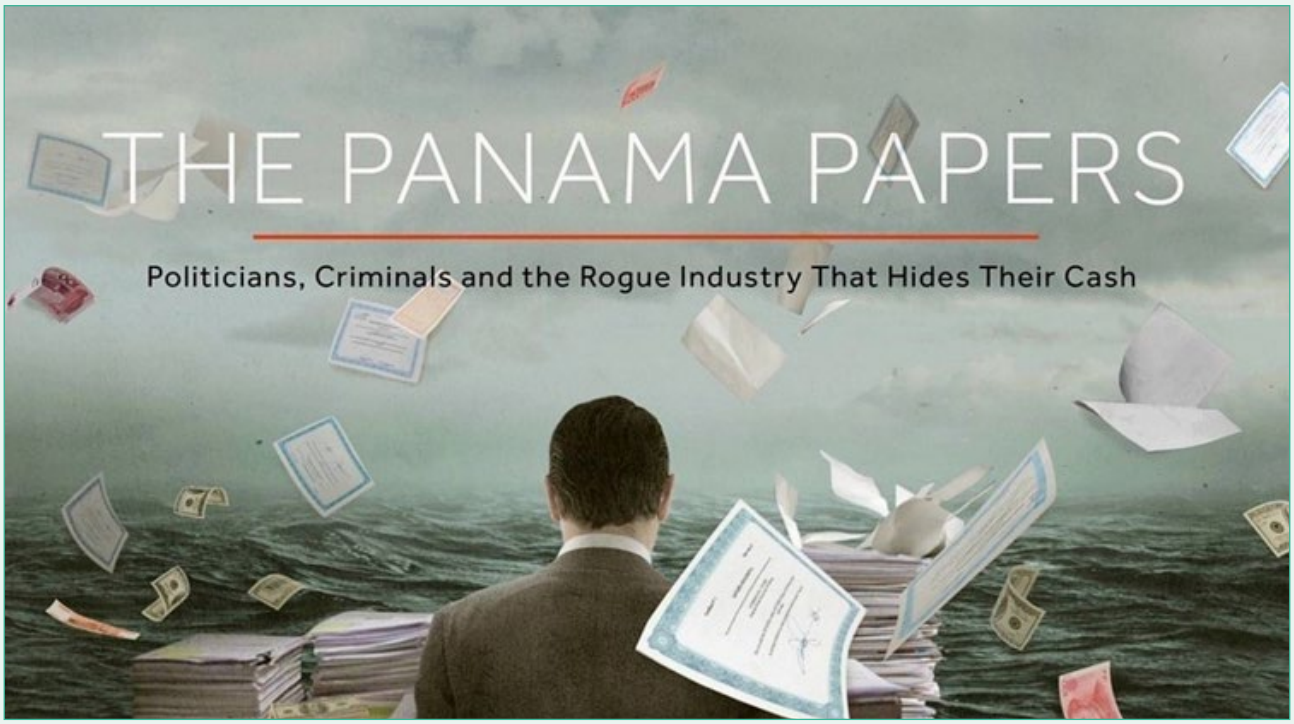
Even more concerning is that, in some instances, governments appear to be moving backwards on open data. According to the Open Data Barometer in 2015,[279] there was a *"backslide on freedom of information, transparency, accountability, and privacy indicators in some countries"* while countries such as Spain have been accused of refusing to open key datasets, including corporate ones.[280]



GrantNav uses the 360Giving data standard to help people search grants.

Finally, open data is not just about public sector data. Civil society and corporates also need to open up data, both of their own accord and, when necessary, through legislation and regulation. In some cases, organisations are doing this proactively; 360Giving, for example, is a standard for CSOs to open data about grantgiving, while a growing number of 'data collaboratives' worldwide show how private companies can open up data when a social benefit is clear.

In other cases, government incentives or regulation are necessary. In 2016, the UK became the first country in the world to publish data about beneficial ownership,[281] and Germany, Norway and Denmark have plans to do the same. But some countries are lagging far behind; Austria, Greece, Macedonia and Spain all receive zero in Open Corporates' Open Company Data Index.[282] At the European level, it was concerning for the Commission to abandon plans to legislate for national beneficial ownership registries in the 4th Anti-Money Laundering Directive.[283]



The Panama Papers investigations showed the importance of opening up corporate data to journalists and civil society. Open Corporates, one of the more successful DSI initiatives, played a significant role in the investigations.

Personal data protection and identity management

Concerns about personal data protection and privacy have rapidly risen up the agenda in the past two years. This has been driven by the rise of opaque algorithms in many aspects of our everyday life, by worries about the way in which proprietary platforms use and hold our data, by the growing threat and frequency of cyber-attacks, by revelations and legislation about government surveillance, and – conversely – by a better understanding of how much we could benefit as individuals and as a society if we have better control over our personal data.

As the internet becomes ever-more dominant in our daily lives, worries about privacy and data protection become more dominant too. For some, *"the ongoing centralisation of the Internet and ICTs generally, prefigures a [future] in which state and corporate surveillance and control destroy the very freedoms that open access to information and communication are meant to uphold."*[284] High-profile figures including the founder of the World Wide Web, Sir Tim Berners-Lee, have voiced concern about privacy issues,[285] while a number of organisations are developing a range of responses (see pp.74-75).

The European Commission has led the way globally on regulation for data privacy, with data protection reform agreed between the Parliament, Commission and Council in December 2015 and adopted by the Council and Parliament in 2016. Both the Regulation (General Data Protection Regulation, GDPR) and Directive will come into full force in 2018.[286] Furthermore, DG-CONNECT's exploratory work on the Next Generation Internet (NGI) has a strong focus on data protection and privacy. This is a welcome development which should be built upon.

We are creating massive amounts of personal data - but we do not have control over it.

Taking back control: Initiatives for personal data management and sovereignty

As concerns have grown rapidly over the course of the past five years about privacy, surveillance and the data collection practices of large corporations, several initiatives have emerged to give citizens control of their data and to improve transparency. These have developed alongside policy actions at the European and national levels.

For example, there are a number of initiatives focusing on personal information management (PIM). One of these is digi.me, which allows users to choose the data (social networks, finance, health, and so on) they want to add to their own personal data library, to search and explore this data, and to share it on their own terms.

MyData, based in Finland, is an initiative which aims to empower people to access, obtain and use datasets containing their personal information through developing infrastructure to remodel the relationships between businesses and citizens. It is currently working with almost 50 partners across Finland, and also organises the annual MyData conference to *"shape the fundamentals on how personal data is managed globally."*[287]

A hack at the MyData Conference 2016.

Led by six UK universities, Hub-of-all-things (HAT)[288] is a project designed with similar aims, and describes itself as *"an ecosystem that exists to enable all users, developers and organisations to support the exchange and trade of personal data"* through developing personal information management systems (HATs). Alongside this is the HAT Data Exchange (HATDeX), the infrastructure platform for personal data and content exchanges within the HAT ecosystem; HAT Apps, the applications which use data from citizens' HAT private data accounts; and HAT providers, which issue private data accounts powered by the HAT technology to their customers. Furthermore, HAT has a community foundation, which promotes adoption of the HAT ecosystem, and a HAT Open Innovation Ecosystem Fund which runs hackathons, events and offers seed funding.

The Tactical Technology Collective, based in Berlin, has been working in the field of personal data since 2003, and combines activism, awareness-raising and projects, often making a complex topic much more accessible to the general public. For example, it has produced the Data Detox Kit,[289] an eight-day guide for people to understand more about their data and gain more control over it. It also created Me and My Shadow,[290] a website providing resources and how-to guides, and developed the Trackography project,[291] which enables citizens to know who is tracking them online. Taking protection against tracking one step further, Better[292] is a privacy tool developed for Apple devices by the social enterprise ind.ie, based in Stockholm, which protects users from behavioural ads and tracking.

Finally, the European Commission recently funded the DECODE project,[293] a consortium of 14 partners which will develop blockchain-based tools to allow users to retain control of their personal data, giving them a choice over whether to keep it private or share it for the public good in the form of new data commons. This data commons model will develop a new political, economic, and legal regime recognising social and communal rights to data, so that cities, communities and neighbourhoods can use that data for their own services and social good.

The Tactical Technology Collective's Data Detox Kit.

Supporting the growth of DSI at the macro (ecosystem) level: Five key lessons

1. **Funding is insufficient and unevenly distributed**. Access to finance remains one of the key challenges for DSI practitioners. Both grant funding and social investment for DSI and related areas remain scarce, particularly when compared to the amount invested in commercial digital innovation. Funding is unevenly distributed: while countries like the UK have maturing funding ecosystems, and countries like Sweden, Finland and Germany have developed structures for public support, funding is particularly scarce in Eastern Europe. Furthermore, we have identified a specific gap in funding between the very early-stage funding and investment and post-revenue investment. Rectifying this requires not just increased funding but also structures for building pipelines and establishing milestones to support funders and practitioners.

2. **Structural digital skills shortages and difficulties accessing support skills are holding back the growth of DSI**. Digital skills shortages are holding back the growth of DSI just as they are holding back economic growth in Europe. DSI initiatives need access to people with broad and deep digital skills in a growing range of areas if they are to grow their impact, and despite significant efforts in recent years by the public, private and third sectors there is still a long way to go to fill the gap. Secondly, DSI practitioners often lack business and support skills such as communications, marketing and business planning. Action is needed to build upon and develop existing initiatives which equip practitioners with these skills and improve their access to others with these skills, and encourage knowledge-sharing between practitioners.

3. **Adoption by established civil society organisations has been slow because they lack digital capacity and awareness**. There is an increasing understanding that CSOs are behind the curve on digital: they lack digital skills in their workforces, digital leadership, digital strategies and awareness of digital trends and

opportunities. At the same time, DSI offers the opportunity to operate and deliver better services at a lower cost and to put supporters and service users at the heart of their work, but there are few examples of this opportunity being realised. To continue to flourish amid increasing demand and budget constraints, CSOs must invest in digital, and be supported by policymakers and funders to do so, in order to achieve their mission. CSOs must also ensure that any DSI approaches they develop are appropriate for their level of digital maturity.

4. **The public sector has not yet seized the opportunity in DSI to deliver better services at lower cost, and to thereby bring DSI into the mainstream**. Many, if not most, DSI initiatives will be able to grow more rapidly through integration into the public sector and government. Where the state holds a monopoly, for example in health and education, it may be the only way of delivering impact at scale. In turn, DSI offers the state the chance to involve citizens, reinvigorate democracy and deliver better services at lower costs. However, barriers to innovation, digital skills shortages, complex procurement processes, infrastructural challenges and political resistance are preventing mainstream adoption of DSI by the public sector. Examples from across Europe, however, demonstrate the potential of strategic commitment to DSI.

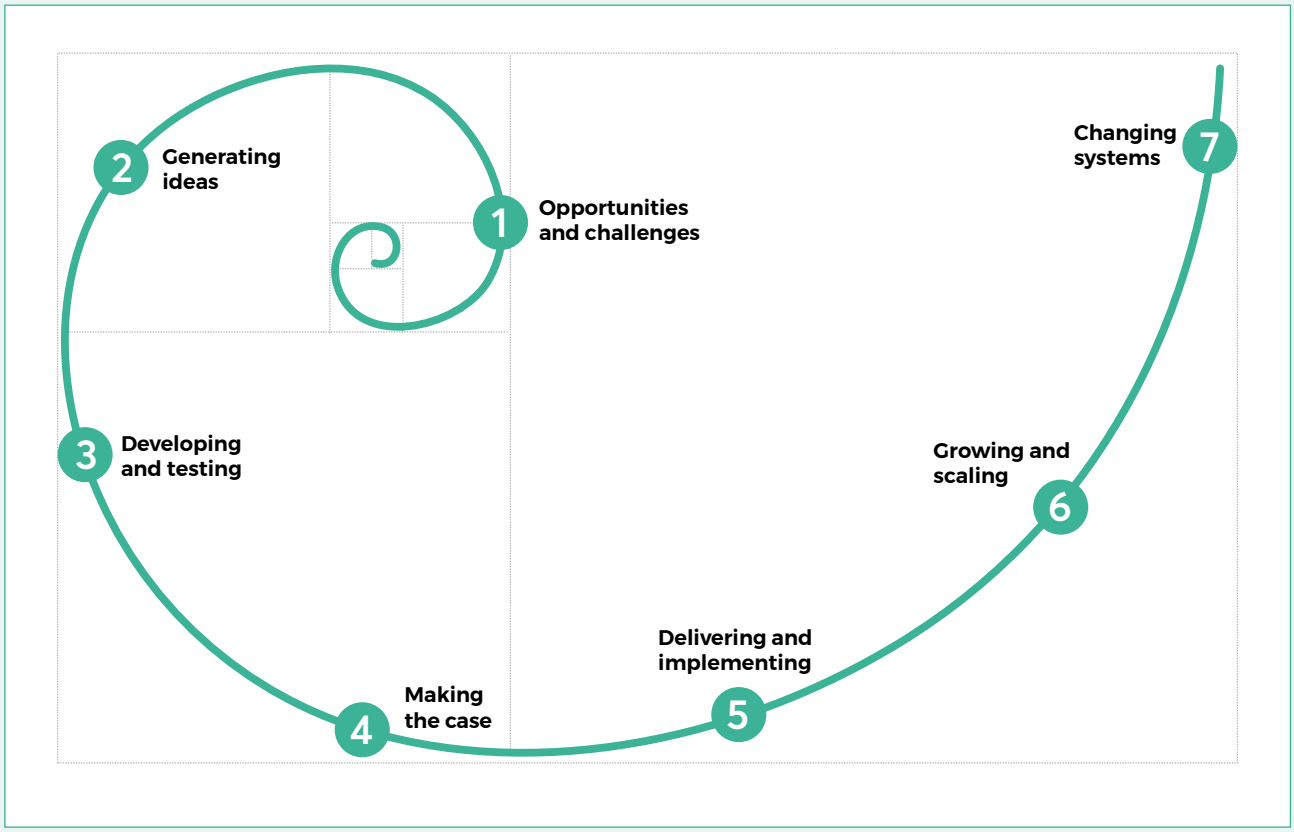
5. **Governments have an important role in enabling DSI through policy and infrastructure**. Although Europe has led the field in areas like open government, open data and personal data protection, there is still much work to be done. In some cases, there is evidence of progress slowing and, worryingly, even of steps backwards. Furthermore, investment in digital skills for all and in internet and data infrastructure is essential if DSI, and digital technologies more broadly, are going to deliver social impact and reduce, rather than replicate or exacerbate, existing inequalities and discrimination.

Barriers to growth at the project level

Alongside the ecosystem-level barriers and conditions for growth discussed thus far is a set of enablers and challenges for individual DSI projects and organisations. In some ways, these constitute some of the biggest questions in the field of DSI: if DSI relies on participation, how do you encourage participation? how can an innovation go from delivering impact for some to impact for many? how can we make DSI projects sustainable? how can we understand whether DSI actually works?

We need to understand these questions in order for the best DSI initiatives to move from generating and developing ideas, and delivering impact at a small scale, to growing, scaling and ultimately changing systems.

Therefore, in this section we explore the most common of these challenges in the fields of engagement, impact measurement and growth strategies and sustainability. We also draw upon examples of successful approaches. Alongside the recommendations following this section, we have developed a practical guide which provide a structured way for practitioners to think about engagement, impact and growth (pp.106-134).

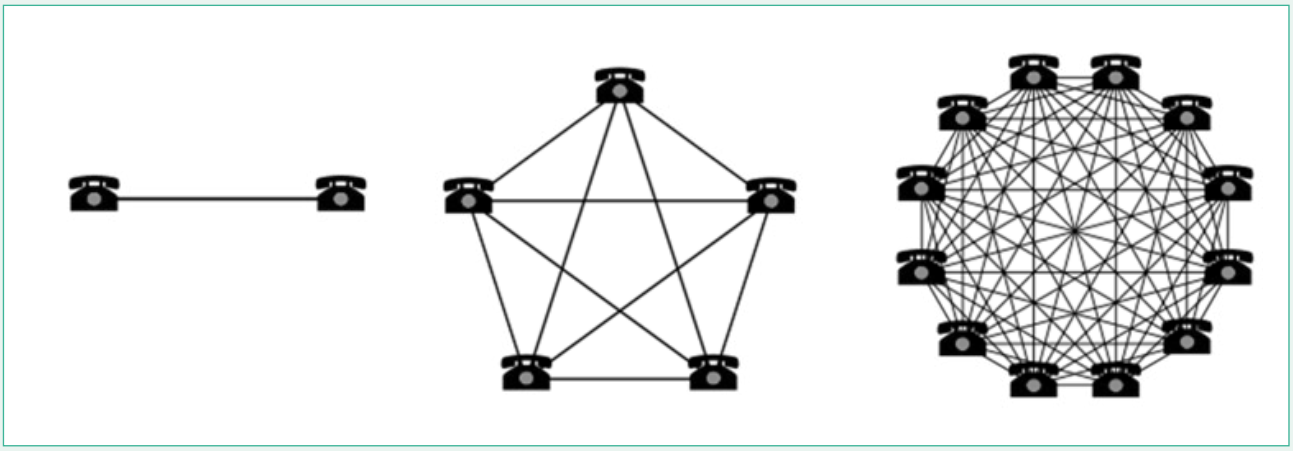


There has been no shortage of activity in DSI at the early stages of the innovation spiral - but few initiatives have progressed to growing and scaling.

Engagement

Citizen engagement is fundamental to the success of DSI, which is by definition social and collaborative. Digital social innovations benefit from network effects: as the size of the network increases, the value to each user increases, and the overall value of the innovation increases by more times than the size of the network. Most digital social innovations need to reach a critical mass of users before they deliver value and impact to users and beneficiaries.

However, engagement is one of the biggest challenges for practitioners, the reasons for which we explore below. Successful engagement demands explicit, strategic and targeted efforts – efforts which many practitioners underestimate – as well as specific skills. We encourage practitioners to refer to the guidelines on pp.106-134 and the other resources they list.



Although not all DSI initiatives follow Metcalfe's Law, they benefit from network effects in similar ways.

Barriers to successful engagement

We have identified five main challenges which practitioners face when engaging users in their initiatives.

Understanding the landscape. We have found that practitioners, motivated primarily by a desire to foster social change, often fail to understand the landscape before embarking upon development of their projects. Practically, there are three areas in which practitioners do not always carry out the necessary research:

- **Market research**: understanding whether their idea, or something similar, already exists, even though in many (or even most) cases it does.
- **User demand**: analysing whether there is a pool of potential users who will be willing to spend time and/or money using the service or tool. As Daniel Robinson from Nominet Trust noted, *"social need doesn't automatically translate into demand. There might be a pressing need, but at the end of the day you can't force people to use something."*
- **Effective demand**: working out if someone will pay for the service or tool, whether that be through grant funding, contracts, donations or any other income model.

DSI practitioners who do not take the time to understand the landscape from these three viewpoints are likely to have significant difficulty engaging users once they have a product or service.

Recognising the need for engagement efforts. In the field of DSI, we have observed that the 'build it, and they will come' mindset is common, if not dominant. This is the idea that people will use products and services without the need for significant engagement efforts – and is sadly rarely true. As emphasised by the Knight Foundation, a leading civic tech funder in the US, *"the underlying assumption that new platforms would tap into pent-up demand for civic engagement has simply not borne out."*[294]

In reality, huge efforts are needed for engagement. Just as much commercial digital innovation is enabled by investing huge sums in marketing and communications (sometimes over half of revenue[295]), DSI initiatives should see investment in engagement as a priority which is fundamental to success. To take one example of where investment in marketing has paid off, Decide Madrid, the Spanish capital's government engagement platform, invested €200,000 of public money to promote the 2016 participatory budgeting process, equating to more than €4 per voter. This led to over 45,000 people engaging. [296]

Creating an outstanding user experience. The most successful DSI initiatives invest heavily in developing an outstanding end-to-end user experience, including not just the usability of services and products but also the ease with which users can initially engage, understand their role, involve peers and understand the impact they are having. Furthermore, developers of projects with a further end user – such as civil servants or researchers – must also bear these groups in mind.

The design process requires developing and accessing skills like service design and user experience (UX), and it requires in-depth interaction with users throughout. Ultimately, people will not use products they do not like to use:

"The only products that are able to have a real impact, because they reach a mass audience, are those that can compete with regular products, not just because they're sustainable, but because they are as good or even better than the other options."

Daan Weddepohl, Peerby[297]

Peerby, a platform for local asset-sharing, is a good example of iterative and proactive development; every fortnight the team runs data-based experiments and uses qualitative and quantitative data to evaluate whether it is working or not.

What to communicate, and how to communicate it. Many practitioners have difficulty tailoring their messaging and communications. In particular, we have observed a tendency to focus on technology rather than social impact, which inhibits engagement by both citizens and public services. Furthermore, practitioners do not always analyse the specific motivations for which users engage – an analysis which needs to be done by working with those users.

Furthermore, some initiatives have trouble telling a compelling story (or stories) of impact. Some examples of organisations who communicate their mission, vision and story well include CitizenLab (see p.50),[298] Precious Plastic,[299] Open Corporates[300] and The Restart Project.[301] These organisations exploit different channels including blogs, case studies, social media, video, visualisations and podcasts. Particularly ambitious examples are

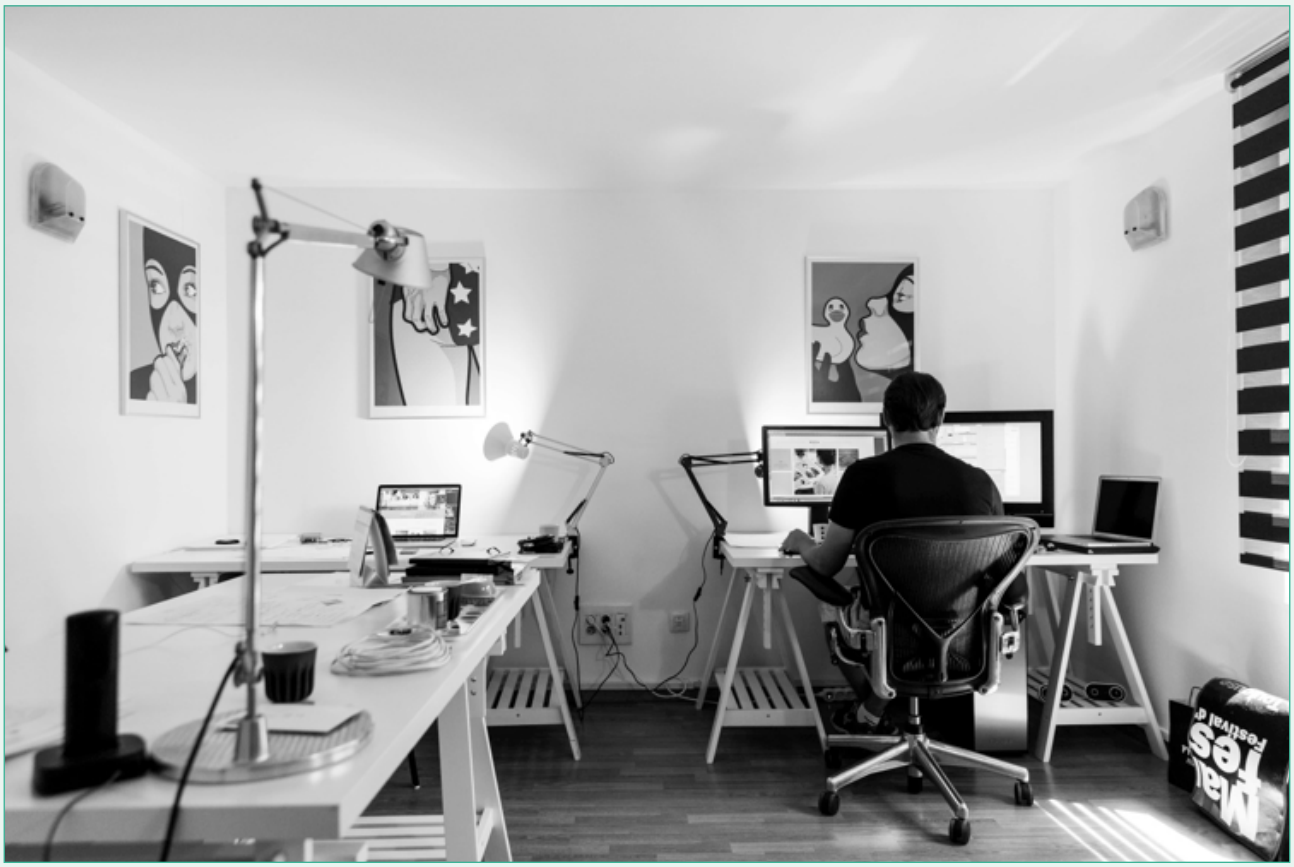
the Spending Stories[302] and Subsidy Stories[303] platforms developed by OpenSpending, which are interactive tools aiming to improve fiscal literacy and improve the transparency of EU funds respectively through news, storytelling, data and graphics. Furthermore, there are excellent examples of support organisations bringing together success stories such as the Open Data Institute's case studies,[304] betterplace lab's annual Trend Radar,[305] the Social Tech Guide and annual NT Social Tech 100[306] and Empodera's annual publications.[307] All of these collate practitioner stories and instances of technology delivering real impact.

Clockwise from left: Empodera's annual publications, betterplace lab's trend radar, Nominet Trust 100 logo.

Digital inclusion. In a field in which many initiatives aim to help society's most vulnerable, and which aims to empower all citizens, digital inclusion should be integral to any initiative. Amid hype about emerging technologies, the scale of digital exclusion – explored earlier in this section – is often forgotten. A useful mantra for the DSI community might be the design principle of the UK's Government Digital Service: *"Design for the needs of the furthest first. Make it work for the people who need it most, not the most people."*[308]

If DSI initiatives are not inclusive, digitally-excluded people (often those in most need, such as older people, the unemployed, people on low incomes, people with disabilities and

ex-offenders, for example[309]) are less likely to benefit from them. In turn, initiatives may lose legitimacy if they do not involve all the citizens who should be able to be involved. If they are not inclusive, they may replicate, or even exacerbate, patterns of privilege and discrimination based on gender, ethnicity, age, disability, location and socioeconomic status. As discussed earlier in this section, there is already some indication that this is the case – which makes understanding impact, discussed later in this section, even more important.[310]



Emerging research suggests some DSI initiatives are further empowering the empowered, rather than empowering the vunerable.

Some studies suggest that digital inclusion is not being addressed by DSI initiatives. The Impact Assessment for Social Innovation (IA4SI) project found that CAPS projects in the first round paid *"no attention towards the digital divide issue."*[311] One interviewee noted that online platforms only mirror what happens offline, but we believe that DSI should be doing more than replicating existing divisions. They must be *more* inclusive than offline counterparts.

Inclusion is a challenge as much for practitioners as it is for policymakers, the education and skills system and the rest of civil society. Inspired by leading examples, DSI practitioners should be leading the way in this area.

Supporting all citizens to be innovators: MK:Smart

MK:Smart[312] is an initiative developing innovative smart city solutions to support economic growth in Milton Keynes, one of the UK's fastest-growing cities. It is centred around the development of the MK Data Hub, which brings together vast amounts of open data. MK:Smart is a collaborative project led by the Open University, with funding from the Higher Education Funding Council for England (HEFCE), and brings together partners from academia, government (namely Milton Keynes Council), business (such as BT), civil society (Community Action MK) and innovation centres (Satellite Applications Catapult and Transport Systems Catapult).

MK:Smart and Our MK logos.

Post for the Our MK Citizen Ideas competition.

MK:Smart has citizen engagement at its heart, aiming to involve people not just through outreach but as co-creators and innovators themselves. To do this it launched the Our MK[313] platform in 2015 to crowdsource citizen ideas for how to improve communities using technology and data. After ideas are submitted, the project team runs workshops to facilitate the forming of groups around specific ideas. The best are then invited to submit a project proposal, and the best of these are given financial and non-financial support to turn their ideas into reality. Since Our MK launched, it has gathered over 100 ideas and supported 13 of these projects to become reality, including an app-based game to engage people in cycling and a series of workshops to teach parents basic computer literacy skills.

MK:Smart is aware that citizen-led innovation projects risk becoming the preserve of the technologically-aware, a small segment of the population who are arguably also those least likely to need help in improving their local communities. This risks replicating or exacerbating existing inequalities and undermines the core values of the open data movement.

Therefore, MK:Smart has developed two schemes to promote widespread engagement and inclusion. Firstly, the MK:Smart project has built partnerships with existing organisations in the city and harnessed their expertise and networks.

MK:Smart works with Community Action MK (CAMK), an organisation supporting communities within the city, to engage disadvantaged and lower socioeconomic groups, to understand their concerns and to gather their ideas. CAMK has provided insight into how to engage these groups and act as mediators facilitating knowledge exchange and outreach. CAMK also has ten 'Community Mobilisers', individuals who visit areas in particular need and engage them through one-to-one conversations, group discussions and events. MK:Smart is using these Community Mobilisers as a way of promoting the Our MK platform to these disadvantaged groups. As a result of these efforts, of the citizens leading 13 successful projects, half live in areas which are in the bottom third for social deprivation, six are women, and they are spread across age groups including three project leaders over 60.

Secondly, looking in the longer term, MK:Smart has developed the Urban Data School[314] (UDS), an initiative designed to improve data literacy among 8-18-year-olds and to in time create a generation of citizens who are able to ask and answer questions of data, critique data, tell stories with data, and recognise how it can be used to benefit themselves and their communities. Currently focused on Milton Keynes, the eventual aim is to make the UDS a national or even international resource. The UDS has been piloted with 100 teachers and students, and evaluations have indicated positive results for both groups.

Since its launch, MK:Smart and Our MK have won several awards, including at the Smart Cities UK Awards and at TM Forum Live.

A workshop held by CAMK as part of the Our MK project.

Growing impact, measuring impact and sustaining impact: mySociety

mySociety[315] is one of the most respected pioneers of civic technology, not just in Europe but globally. From its origins as UK Citizens Online Democracy in 1996, and the founding of mySociety in 2003, it has led the way in showing how technology can be used to improve citizen engagement. Some of their best-known projects include:

- **FixMyStreet**, an app for reporting street problems to local authorities;
- **WhatDoTheyKnow**, a freedom of information site;
- **WriteToThem**, a tool for writing to elected members of parliament;
- **TheyWorkForYou**, a tool for finding out about elected officials, their voting records and their statements;
- **EveryPolitician**, which aims to collect, store and share information about politicians in every parliament in the world, past and present;
- **MapIt**, which maps geographical points to administrative areas;
- **Mapumental**, which shows public transport travel times, from or to a chosen postcode, on a timebanded map;
- **PledgeBank** (now closed), which let people set up pledges in the form: 'I will do something, if a certain number of people will help me';
- **HearFromYouMP** (now closed), which enabled better communication between MPs and constituents.

mySociety's sites are among the most successful civic tech tools today, and some have become institutionalised – 98 per cent of local authorities in the UK, for example, accept FixMyStreet reports. In 2015, mySociety sites in the UK received over eight million users and 30 million page views, and completed 450,000 transactions. This growth is due to a combination of outstanding and easy-to-use websites, strong engagement with policymakers and the public sector, and identification of areas in which tools do not currently exist and are needed.

mySociety logo.

Another central key to its success is the fact that all of its products are open-source, so that people in other jurisdictions can develop their own versions of the services. As a result, there are now over 70 international sites in 44 countries running mySociety code. Alavateli, the source code for the Freedom of Information websites, runs in 25 jurisdictions.

Beyond its hugely successful services, mySociety is also an exemplar of understanding and measuring the impact of its tools, and of civic technology more broadly. Research is a core activity for mySociety, and it has a comprehensive research strategy which outlines four priorities: understanding

FixMyStreet, one of mySociety's most successful projects.

how individuals and institutions use and are impacted by civic tech; prioritising novel, comparative and innovative research; accelerating the dissemination of research findings; and developing a global network of researchers in civic tech. Alongside carrying out impact assessments of its projects, mySociety's research programme works with partners including the World Bank and since 2015 has held an annual conference, TICTeC (The Impacts of Civic Technology Conference), bringing together speakers, practitioners and researchers from across the world to discuss their work.

Finally, mySociety is an interesting example because of its business model. Officially a social enterprise, mySociety receives grant funding (from organisations including the Omidyar Network, Indigo Trust, Hewlett Foundation, Open Society Foundations, Microsoft, Making All Voices Count, Joseph Rowntree Reform Trust, Google and Bytemark for example). It also generates income through offering commercial services in its 'Better Cities' programme, whose profits subsidise non-profit work. Finally, mySociety works with international partners, often with joint funding, to offer services including advice on getting started with mySociety tools, documentation and tech support, guidance on funding and web hosting, as part of its charitable work. In 2015, mySociety worked with 13 partners including Médecins sans Frontières, Full Fact and Socrata.

Going forward, mySociety is aiming to continue to develop its business model so that it can be less reliant on grant funding, and to continue to focus on the areas in which it is strongest – Freedom of Information, Better Cities and Democracy.

TICTeC 2016, held in Barcelona, Spain.

Understanding, measuring and communicating impact

Over the past decade, theory and practice for understanding and measuring the impact of social innovation has developed significantly.[316] In contrast, both theory and practice around impact are undeveloped in the field of DSI.

In general, we have found that DSI initiatives are poor at understanding, measuring and communicating their impact; that there are few DSI-specific frameworks and tools; and that demand for impact measurement has been weak because of the limited attention paid to DSI by funders and commissioners.

In this section we reiterate the case for measuring impact and outline current practice and common challenges.

Making the case for impact

The case for understanding and measuring impact is well-rehearsed,[317] but is worth reiterating. Understanding and measuring impact should be a core part of DSI because:

- It allows practitioners to better understand their practice, its direct and indirect (positive and negative) impacts and how their intervention affects and is affected by other interventions. It challenges them to articulate and interrogate their assumptions;
- It is essential for accessing partnerships, procurement, funding and investment;
- Given the participatory nature of DSI, initiatives must also be able to communicate their impact to the citizens they aim to engage, and not just to funders and commissioners.

Understanding the complexity of impact measurement

In social innovation (and not just DSI), impact measurement is a complex landscape, which practitioners have difficulty navigating. In part this is because of the sheer number of resources, tools and metrics developed in recent years,[318] which – while a welcome indicator of impact entering mainstream consciousness – presents a bewildering array to practitioners and other stakeholders, and prevents shared understanding of impact.

It is also a complex field because there is no one-size-fits-all solution. The approach to how impact is measured will depend on different factors such as the stage of an initiative's development, how novel the intervention is, whether there is existing research which can be drawn upon, the social area of the intervention and the demands it entails, the timeframe over which impact will be achieved, the audiences who need to know and understand the impact, and the motivation behind the initiative.[319]

Impact measurement in DSI

Theory and practice for social innovation impact measurement are only applicable to DSI to an extent. For example, Randomised Control Trials (RCTs) are usually unsuitable because of the length of time they take and the practical and ethical difficulties of separating a control and treatment group for an initiative which relies on widespread participation. At the other end of the spectrum, even simple input-output models for early-stage initiatives are not always suited to the iterative and rapid development of DSI products and services.

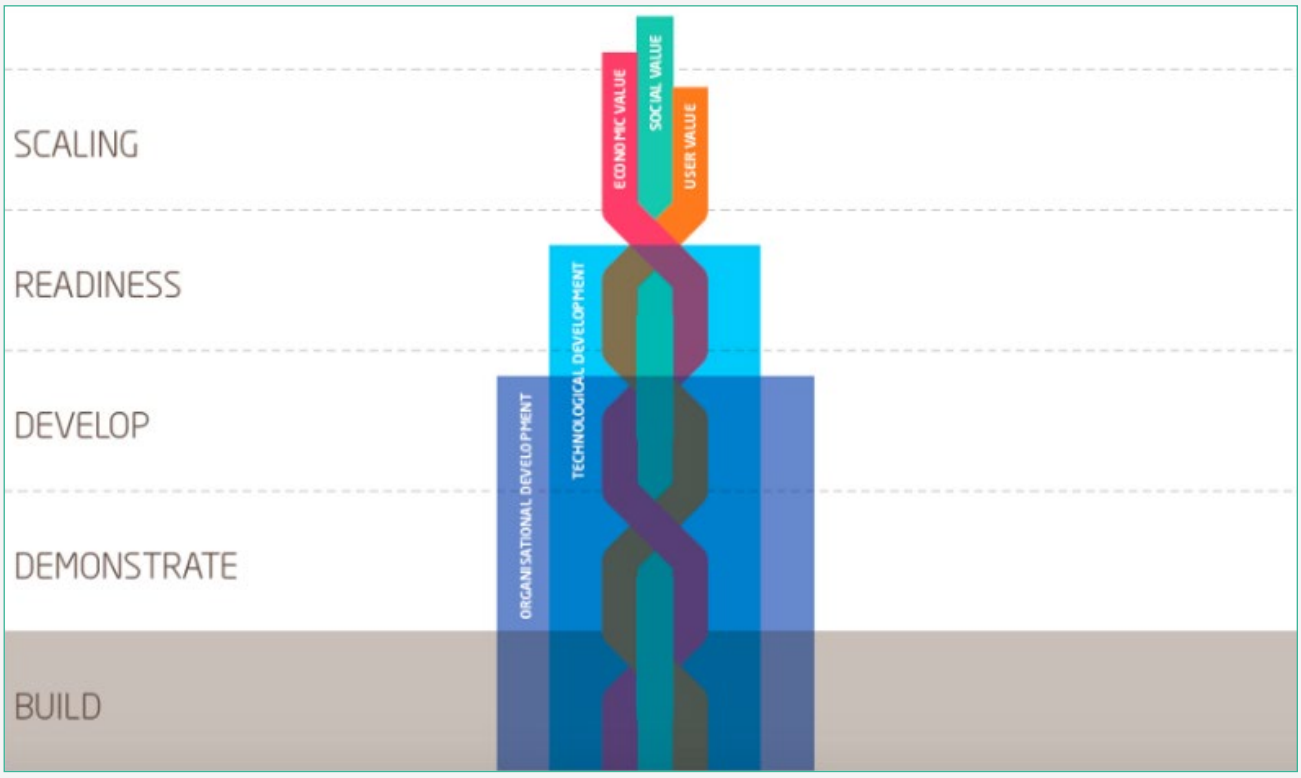
Impact measurement in DSI poses particular difficulties because initiatives involve many different impacts – primary and secondary, direct and indirect, objective and subjective, short-term and long-term, positive and negative. To take an example to show this complexity, a digital democracy platform might use any of the following measures to understand its impact: self-reported engagement in democracy; objective (behavioural) engagement in democratic processes; representation of different social groups of the population; creation of new policies; improvement of policies; effect on implementation of policies; effect on medium- and long-term responsiveness of government; effect on community cohesion; effect on polarisation; and a host of other potential impacts. This makes it more difficult to formulate approaches to impact measurement for initiatives and to agree on standards across areas.

Resources and tools for DSI impact

The need for DSI-specific models is clear, and fortunately activity has increased in this space in the past three years. One of the most active organisations in this field has been Nominet Trust, which developed the Triple Helix of Social Tech Innovation in partnership with Shift Design.

The Triple Helix model describes how user value, financial value and social value interrelate at different stages of a venture's development. Building upon this, Nominet Trust developed Lean Social Metrics, inspired by the lean startup approach, which are *"leading indicators which give signs of the potential of future social value"*.[320] In other words, compared to the traditional methods of impact measurement, which focus upon long-term goals and impact, these metrics allow practitioners to understand impact from week to week as they develop their projects. They are intended to use data which can be gathered cheaply, quickly and easily.

Similar work to develop tools for civic tech has been carried out in the US by the Knight Foundation and Network Impact, who have developed How to Measure Success: A Practical Guide to Answering Common Civic Tech Assessment Questions.[321] This is a practical guide taking civic tech project teams through creating a plan, learning about users, tracking recruitment and participation and assessing progress towards outcomes. Like the Lean Social Metrics, these focus on intermediary outcomes which are available sooner than large-scale evaluations of impact.



Nominet Trust's Triple Helix of Social Tech Innovation.

How are DSI practitioners approaching impact?

Impact practice among DSI practitioners is generally weak, with more sophisticated approaches almost solely developed by initiatives who have external demands for impact measurement or who have gone on programmes such as accelerators. Most do not use frameworks like Theory of Change or logic models, and many do not systematically collect metrics. (When they do, they are often those which are easy to collect, like social media followers or website visits, rather than those which reliably demonstrate impact.)

Although the interviews undertaken for this project provide a far from comprehensive assessment, other sources suggest a similar picture. The Knight Foundation, for example, found that *"practitioners and funders alike have lamented the struggle to measure the effectiveness of new civic tech tools,"*[322] while Shift Design report an *"endless stream of social tech projects that have some user traction and can generate some revenue, but have no clear picture of their actual impact."*[323] Similarly, Bill Hunt, previously of the Sunlight Foundation and OpenGov Foundation, highlights how *"[t]he larger nonprofit world [..] has been using logic models for program evaluation for decades — but this work has gone largely ignored in the civic tech community."*[324]

The lack of impact measurement in DSI can be attributed to shortcomings by both the 'supply' side (practitioners and support for practitioners) and the 'demand' side (funders, investors, commissioners).

On the supply side, firstly, some practitioners (but by no means all) do not recognise the importance of good impact practice. At best, this might limit initiatives' ability to grow their impact and improve their practice. At worst, it could lead to the continuation of an intervention which is having a negative impact.

Secondly, and encouragingly, many practitioners do profess a desire to understand and measure impact better, but lack the time, capacity and expertise to do so and report that impact often loses out to competing priorities. As Diana Krebs, project manager of OpenSpending at Open Knowledge International, told us, *"Moving forward, we acknowledge stakeholders' need to understand what impact open data has, and it's a very important topic which we research at Open Knowledge International. In my daily work, however, the more pressing issues are data quality and increasing data literacy skills around fiscal data."*

Thirdly, the limited number of DSI-specific resouces (as discussed above) and the general youth of the field mean that practitioners lack the support necessary to understand and measure their impact.

On the demand side, practitioners have not been encouraged or required to understand and measure their impact as much as in other areas of social innovation, because funders, established CSOs and the public sector have been less engaged with DSI. We know that funder requirements are the biggest driver of charities increasing their efforts in impact measurement, but also a significant source of support for them.[325] Therefore, as funding increases and the public sector and civil society engage more in DSI, demands and support for strategic approaches to impact should also increase.

The Impact Management Project[326]

More and more policymakers and funders now understand the importance of impact, but this has led to significant variation in how different stakeholders understand and measure impact. In turn, this makes it difficult to aggregate impact data, to understand expectations and to share learning. It also makes the challenge of impact measurement more difficult and confusing for practitioners.

The Impact Management Project is a new partnership between ten funders, facilitated by Bridges Ventures, which seeks to build consensus in the field of impact measurement by facilitating conversations, sharing and discussing insights, developing 'model portfolios' for investors and eventually producing a 'convention' to *"describe consensus on principles and procedures for sharing our impact expectations with each other, which can act as a foundation for positioning and linking to different frameworks, standards and measurement approaches."*

While this project is not DSI-specific, it is encouraging to see greater partnership between impact investors, which should in time make life easier for both investors and practitioners. We hope the partnership will consider impact from the viewpoint of DSI.

IMPACT MANAGEMENT PROJECT

The Impact Management project logo.

Successful approaches to impact measurement

Fortunately, the field is moving forward and there are several examples of DSI initiatives which have developed robust approaches to impact.

In many cases, these are developed with the help of funders and support organisations in areas, through workshops, access to experts and networks, and reserved funding for impact measurement. Nominet Trust, for example, offers one-to-one advice for grantees on impact, while grantees in Nesta's Centre for Social Action Innovation Fund received a specific amount set aside for impact evaluation.[327] Many initiatives have developed strong strategies of telling their impact through stories, as discussed earlier in this section (see p.81).

Some initiatives are using data to measure impact in innovative ways: the Fab City initiative, for example, has developed a Dashboard[328] which brings together data from the OECD, World Bank and fablabs.io to help practitioners visualise how resilient their cities are and how the maker movement is having an impact on this.

A snapshot of the Fab City Dashboard for Amsterdam.

DSI initiatives should not all approach impact in the same way, but all practitioners should think about their impact and dedicate resources proportionate to their stage of development, their needs, and the needs of other stakeholders. For very early-stage projects this might entail just basic Theory of Change and an engaging value proposition, while for initiatives working at scale it might mean a robust independent evaluation. The guidelines in this publication and the resources they refer to are designed to help practitioners at different stages of development.

In short, understanding, measuring and communicating impact is fundamental if we want DSI to deliver social impact at scale. This activity needs to be embraced by practitioners and supported by funders, support organisations, the public and third sectors and researchers.

Growth and sustainability

Growing an innovation is not a linear or straightforward process. Nevertheless, successful growth depends on planning carefully and responsively, understanding different routes to growth and designing for sustainability.

DSI practitioners struggle with this, partly because of a lack of business skills (discussed earlier in Section 3), and partly because the community as a whole (funders, policymakers and researchers as well as practitioners) does not understand routes to growth and sustainability models well.

Traditional models of scale and growth for commercial innovation and social innovation are of limited use for DSI: commercial models are built on pursuit of profit, closed intellectual property and competition, which run counter to the core DSI values of social impact, openness, transparency and collaboration; social innovation research does not take into account the specific benefits and challenges of technology-based growth.

On the following pages we discuss some of the barriers which practitioners face and draw upon promising examples which we have encountered.

Growing DSI initiatives and their impact

As in other fields of innovation, there are multiple routes to growth for DSI initiatives. Because the field is relatively young, we do not yet have a full understanding of the routes to growth, but in the practical guide at the end of this report (pp.126-128) we list the main ones we have identified: increasing use of a product, tool or service; open-sourcing and dissemination; affiliation; developing new products and services; and effecting change in others' practice and policy.

Furthermore, it is important to note that growth is not an ambition for all projects. As mentioned previously, a significant proportion of DSI is carried out by so-called

'free innovators'. In his study on the topic, Von Hippel finds that a large proportion of free innovators are motivated by solving a personal, local or social challenge with little or no ambition to grow their innovation. While only a very small proportion would object to others 'free-riding' to benefit from their innovations, and some realise their potential to benefit others, this does not often translate into proactively trying to grow impact.

In terms of planning for growth, the main challenges for practitioners with ambitions to grow their impact concern: understanding when to embark upon growth; separating the 'core model' (which needs to remain the same) from other aspects of the initiative (which can or must be adapted); finding the right organisational and legal structure; implementing robust administration processes; identifying routes to growth; learning from others' experiences and similar initiatives; and finding potential collaborators from within and beyond the DSI field. All of these challenges are more easily addressed if practitioners have a better understanding of their impact and their users, as discussed in previous pages.

Understanding sustainability: the DSI Sustainability Toolkit

The DSI Toolkit is the result of an experimental part of the DSI4EU project which, from April 2016 to May 2017, involved collaborating with makers, researchers and practitioners in workshops, talks and online meetups to understand how open hardware and maker projects scale, taking into account societal and community good as the end goal. The programme was led by Serena Cangiano at the Laboratory of Visual Culture, the design research unit of Swiss university SUPSI, and Zoe Romano at WeMake, Milan's leading makerspace. Both are partners on the DSI4EU project.

Serena Cangiano (SUPSI) and Zoe Romano (WeMake) present at the LIFT conference, Geneva.

The programme tried to address a number of challenges such as how to support projects initiated by citizens, makers and associations to scale sustainably, given that they do not usually follow established organisational models, and how growth can be facilitated when the concept of scale does not correspond just to financial sustainability and business opportunities.

Starting from these questions, the project team gathered contributions from those who had participated in the programme and aggregated them in an open toolkit featuring five sections. This toolkit is available in pdf and online formats through digitalsocial.eu.

Firstly, a brief essay describes the programme undertaken. The second section presents the main tool, the DSI Scale, which attempts to bring a bottom-up perspective to the challenge of measuring and designing for scale by considering values such as knowledge-sharing and technological openness. The third provides a selection of resources to introduce innovators to key subjects and skills to plan for growth within the current social innovation ecosystem. The fourth consists of interviews with four women who are developing projects in the fields of open hardware, making and technological education, in which they share knowledge, best practices and problem-solving tactics. Finally, the toolkit contains a short kit to allow anyone to become a 'DSI ambassador' in ten steps.

The toolkit features stories and resources from other people's initiatives, research and projects. It is in some ways a 'toolkit of

A workshop held as part of the Toolkit development.

The self-assessment cards and DSI Ambassador badge developed as part of the Toolkit.

toolkits' which has peer-to-peer knowledge exchange at its core. It is an open toolkit whose resources will be expanded online as the community continues to understand how the growth of DSI in Europe can be supported.

By visiting the online version, hosted on GitHub,[329] users can easily access all the resources and tools. Furthermore, they can suggest new resources and tools and create new DSI Scales themselves, through which practitioners can have structured conversations about their ambitions, their journeys to scale and their impact, and to document these conversations online through GitHub issue pages.

A DSI Ambassador at the Rome Maker Faire, 2016.

Business and income models

As discussed in earlier in Section 3, some DSI practitioners lack business-related skills such as understanding business and income models:

"We have near zero experience when it comes to business models. We rely on volunteers from the community to sustain the project."

Mattia Bernini, Precious Plastic[330]

But there is a more fundamental issue concerning business and income models for DSI: we do not yet know how to sustain DSI financially. There are a few promising examples of sustainably funded business models, including product sales, selective pricing, cross-subsidy, freemium models, software-as-a-service, monetisation of data, transaction fees and service contracts. There are also examples of initiatives which have grown to scale through non-market-based models, including donations, crowdfunding, volunteer and pro bono labour, grant funding and consortium/corporate membership models (see pp.129-131). But success stories of sustainability are few and far between.

It is clear that no one-size-fits-all business model exists for DSI. It is also clear that established and emerging business models for commercial innovation are not fit for DSI, as they are based on a combination of intellectual property, competition, advertising and monetising data which in many instances runs counter to the core values of the DSI community. Indeed, as studied by Von Hippel in his study of free innovations, models for funding commons-based, collaborative and open-source models through the market are undeveloped to the point of market failure.[331] As on of our interviewees simply put it:

"The commitment to open-source and free access for all makes it very difficult to make money."

Gunnar Grímsson, Citizens Foundation

As was the case above for routes to growth, different stakeholders in DSI need to collaboratively develop understanding and knowledge-sharing of business and income models. There is a particularly important role for funders and the public sector, who could be instrumental in correcting market failures and enabling the growth of commons-based, collaborative and open-source models through long-term funding.

Although discourse in the world of social innovation is still dominated by social entrepreneurship and the quest for market-based models, the power of the market in social innovation and DSI is starting to be questioned. Civic tech pioneer Tom Steinberg has pointed out that *"[i]f we can be honest and non-judgemental about who should be trying to make their own money and who shouldn't then we can have a stronger sector with a higher success rate and a clearer story to tell about what we do."*[332]

While sustainable business models are desirable, there are some initiatives which deliver impact (or have the potential to) but which are not viable through existing business and income models. But this does not mean they should cease to operate, or change their practice solely to suit the demands of markets. The social impact and public good they deliver outweigh the costs of subsidising them through public and philanthropic funding.

In these cases,[333] long-term grant funding by the public and philanthropic sector should be viewed as a viable and respectable option by both practitioners and funders as, in the long run, this will deliver social impact and save money to the public purse.

Making Sense of our environment: Smart Citizen[334]

Smart Citizen engages citizens, communities, cities, developers and researchers in collectively addressing environmental problems in cities. There are two main strands to the project: the Smart Citizen Kit and the Smart Citizen Platform.

The Smart Citizen Kit is a low-cost set of Arduino-based tools which allows citizens to collect environmental data on light and sound intensity, temperature, humidity and concentrations of CO and NO_2 in the air. As the Kit is open-source, users can build on it to measure other environmental factors.

A wall-mounted Smart Citizen Kit.

The other strand is a cloud-based platform through which researchers, schools, communities, citizens, cities and developers can connect with each other, share data and begin to construct participatory tools to address environmental problems. The platform now contains data from over 1,100 Kits.

The project was developed within the Fab Lab Barcelona at the Institute for Advanced Architecture of Catalonia (IAAC) after a successful crowdfunding campaign on open-source platform Goteo. The team launched a second crowdfunding campaign on Kickstarter to finance an improved version of the Smart Citizen Kit.

The project team learned two particularly interesting things from their crowdfunding campaigns. Firstly, donations do not automatically lead to future engagement. A number of people donated because they were interested in making the project possible, and supporting its narrative and vision, but did not use the Kits they received. Secondly, expectation management is of utmost important. During the first round of crowdfunding, some people expected to receive a fully finished consumer product, when in fact it was more of a critical design prototype which did not always produce accurate data and had some technical shortcomings. This meant that some people became disillusioned.

Smart Citizen is also committed to making sure its work is inclusive, and runs workshops and training programmes to upskill local residents. For example, Smart Citizen organised five workshops with Future Everything in Salford, UK, which introduced children to concepts such as sensors, data and computational thinking. By working on the ground, the team also fosters tight bonds and increases community cohesion, which is essential to developing resilient communities.

Workshops run by Making Sense.

In 2016, Smart Citizen received funding from the European Commission's CAPS programme to scale further through the Making Sense project, a series of nine pilots in Amsterdam, Barcelona and Pristina (Kosovo) experimenting with different methods of community-based sensing. There are now hundreds of Smart Citizen Kits across Europe being used to involve citizens in understanding pollution in their cities.

One notable success for the Making Sense project is in Pristina, where citizens began to measure air pollution because of government refusal to acknowledge the problem. This led to a protest outside the Ministry of Environment and Spatial Planning, which raised awareness and led 3,000 people to sign up to the next project.

Continuing its growth in another direction, the Making Sense project is now developing other sensing products. For example, after identifying noise pollution as a common concern among Barcelona residents, Smart Citizen developed the #NoiseBox to measure noise in different areas across the city.

Activists campaign against air pollution as part of the Making Sense project in Pristina, 3rd May 2017.

Barriers at the project level: Five key lessons

1. **Engagement is no easy task - it needs time, investment, skills and support**. Many DSI initiatives struggle to engage citizens, which is essential to their success. This can be due to different reasons, including lack of market and user research, underestimating the need for engagement efforts, developing products and services which do not appeal to citizens, and understanding methods and channels of communication. Funders and investors should support practitioners to develop and access the necessary skills and support for engagement.

2. **Practitioners must put digital inclusion first**. If DSI is to effectively address social challenges, often those which affect the most disadvantaged, it must be digitally inclusive. Practitioners must complement digital inclusion efforts developed at the system level by building services and products open to everyone, not just the early adopters, This is especially important if failing to do so could entrench inequality or reduce initiatives' legitimacy and impact.

3. **All stakeholders must do more to interrogate whether DSI initiatives actually work**. DSI is still a new field, and despite its promise, very little has been done to understand the impact initiatives are having. One the one hand, this is due to a lack of demand, because of limited uptake by funders, investors, CSOs and the public sector. On the other, practitioners are often unwilling or unable to understand and measure their impact in a way which is proportionate to their initiative. Without a better understanding of how DSI is affecting people, societies and the environment, and whether it is a good investment of time and money, DSI will not - and arguably should not - grow.

4. **We do not understand enough about routes to growth and business models**. Relatively few initiatives have grown to deliver impact at scale, and some of the values and principles of DSI run contrary to dominant market models (like free access and open-sourcing over proprietary ownership, and collaboration over competition). As a result, we do not yet understand in enough depth how DSI initiatives can grow their impact and become sustainable through market-based or non-market-based models. More research and knowledge-sharing must take place to help us identify, categorise and develop promising models for growth and sustainability.

5. **Every DSI initiative will grow in a different way, but there are common lessons to be learnt**. There is no single way to engage citizens, to measure impact, to grow an initiative's impact or to be financially sustainable. Nevertheless, our research has identified common conditions and strategies, which we gather together in the practical guide at the end of this report. Practitioners should use these to develop their practice and, just as importantly, to draw upon the emerging resources and literature being developed across and beyond Europe.

RECOMMENDATIONS

Different stakeholders in DSI must work together to help grow the field. This includes governments, policymakers, funders, support organisations, citizens, practitioners, the private sector and the research community. Below we offer six recommendations which are relevant to funders and policymakers at the European, national and sub-national levels to support the growth of DSI.

1. **Support DSI through funding mechanisms**. The number of social funders involved in DSI remains low. Given that DSI has promising applications in almost all social areas, funders should ensure that organisations using technology-led, collaborative approaches to tackle social challenges can access funding. This can be done through making explicit that DSI is eligible for existing funding streams, and encouraging DSI projects to apply; through developing specific technology-focused funding streams and programmes; or through rewarding collaborative bids between issue-focused existing civil society organisations (CSOs)and DSI projects. Grantmaking organisations should also explore methods which draw upon principles of DSI and DSI tools, such as matched crowdfunding and open grantmaking.

Pages 12-16 explore just a few of the areas in which DSI holds great potential.

On pages 43-44 we discuss innovative methods of grantmaking and funding.

2. **Invest in intermediaries and the support infrastructure for DSI**. There is no shortage of promising DSI projects, but there is little support to help the most promising grow into sustainable initiatives delivering impact at scale. Funding has tended to be directed towards individual projects, which benefits those projects greatly but is of little use to the wider sector. Therefore, policy and funding at the European and national levels should focus support on intermediaries and support organisations such as incubators, accelerators, event organisers, meetups, networks, physical hubs, and training initiatives. This would grow a more decentralised support infrastructure in which whole communities can be supported, rather than just the recipients of funding from centralised initiatives.

We look at intermediaries, including for skills development, on page 48.

We profile two tech for good accelerators on page 52.

3. **Invest in and enable DSI approaches within existing civil society organisations**. Most funding and support for DSI has focused on startups, grassroots projects and new organisations, with little support directed towards existing and established civil society organisations. However, these organisations have an in-depth understanding of social challenges, existing initiatives and local contexts, and their involvement would accelerate the growth of DSI and its impact. On the one hand, the limited support for CSOs stems from very low digital capacity and awareness in the third sector. To address this, funders including the European Commission and national governments should invest in initiatives to develop digital skills and leadership within charities and to raise awareness of the potential of DSI. On the other hand, it stems from a lack of communication and cultural differences between the third sector and new organisations in the field of DSI. Therefore, funders should encourage and reward collaborative projects between existing CSOs and DSI organisations. They should also facilitate knowledge-sharing between CSOs and DSI organisations, for example through secondments and events. Finally, when exploring and funding DSI projects and organisations, funders should not solely focus on cutting-edge technologies but also on established and more basic tools which are within easier reach of CSOs, such as crowdfunding, social networks and crowdsourcing.

Successful adoption of DSI by CSOs is discussed on pages 62-63.

Organisations like CAST are doing excellent work to accelerate adoption by charities. See page 65.

4. **Enable peer learning and the spread of best practice**. The DSI ecosystem remains relatively fragmented, despite the excellent work being done by emerging network nodes across Europe. As a result, it can be difficult for practitioners to identify, learn from and collaborate with similar projects. To address this, the European Commission should continue to invest in and support the development of platforms for showcasing best practice, sharing knowledge and connecting practitioners and other stakeholders. The Commission should also focus on knowledge-sharing between member states, and support DSI initiatives which have demonstrated an ability to support public services to showcase their work in other geographies. Finally, it should facilitate interaction between policymakers, funders and investors across Europe to share best practice and foster collaboration.

We look at a number of network nodes in our case study on pages 33-34.

5. **Conduct further research into the supporting conditions and models for growth and sustainability of DSI**. To date, research into DSI has tended to focus on understanding the DSI landscape across Europe – the amount of activity in different countries, the different social areas being addressed, and so on – rather than the factors which support DSI initiatives to develop, grow and become sustainable. For DSI to grow its impact, we need to understand what the enablers and barriers are to growth, and the different models for growth and sustainability of DSI initiatives. Building on initiatives like the European Digital City Index, the European Commission should support analysis of the critical external success factors for DSI, such as in regards to local funding opportunities, regulation, policy and physical spaces. This would help DSI projects identify favourable locations, but would also – and more importantly – help local policymakers understand how their own cities and regions are performing and what can be done to further support growth. Finally, research is needed into the income and growth models for DSI, understanding where the DSI community can learn from the commercial and other sectors, and where DSI has specific needs and demands.

This report gives only a preliminary overview of some of these conditions and models.

6. **Use public procurement to advance DSI**. Integration of DSI into the public sector is essential for the growth of DSI, especially in sectors where the public sector has a monopoly. Just as importantly, DSI offers the public sector the possibility to deliver better services at lower cost. The public sector, at European, national and city levels, should encourage procurement of DSI initiatives by:

   - Requiring, as far as possible, that when public sector organisations commission the development of new digital tools, they are made open source for reuse by others. When this is not possible, they should provide a clear and accessible justification of why this is the case;
   - Creating a fund for technical assistance and support to reduce the risk for public sector bodies procuring DSI;
   - Setting up pilots in specific places, most likely cities, to trial DSI approaches to public service delivery;
   - Adopting innovative methods of procurement such as pre-commercial procurement, engaging the market to help shape tenders before they are finalised. This has been shown to bring new ideas and a larger constituency of bidders, including smaller companies;
   - Breaking contracts up into smaller contracts where possible, to enable smaller companies to apply.

Pioneering cities across Europe are adopting DSI-led approaches. See pages 59-60 for our case study of Barcelona's digital strategy.

GROWING YOUR DSI INITIATIVE

A practical guide

DIGITAL SOCIAL INNOVATION

GROWING YOUR DSI INITIATIVE

A practical guide

These guidelines are aimed at DSI practitioners, particularly (but not exclusively) those with early-stage initiatives and projects. They bring together findings from successful projects, from intermediaries involved in supporting and funding DSI, and from research.

The guidelines will help you to:

- Understand and engage your users (Part 1);
- Understand, measure and articulate your impact (Part 2);
- Plan for growth and sustainability (Part 3).

Each section is structured as a series of questions which every DSI practitioner should be able to answer, accompanied by brief examples and pointers to further resources. Some of the most useful resources come from pioneering work done by **Nesta**, **Nominet Trust**, **Shift Design**, **CAST** and **New Philanthropy Capital**, and we would like to thank colleagues in those organisations for their work.

These guidelines are not intended to be a strict framework. They should provoke you to question and reflect on your assumptions, to ask new questions about your work, and to seek out further resources.

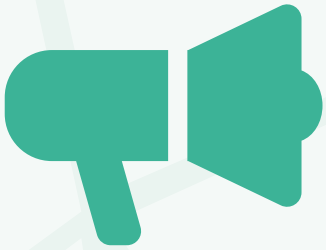
These guidelines are a first attempt at a hugely complex topic. We would welcome your feedback and comments at **dsi@nesta.org.uk** or through Twitter **@DSI4EU**.

The **DIY Toolkit** is one of the most widely-used resources by social innovators. It's quick to use and simple to apply. It includes tools for all stages of developing your social innovation. CAST's excellent **Six Tenets of Tech for Good** sets out principles for social technology initiatives, and Shift Design has great blogs on **the different milestones in a project's growth** and **five lessons on developing social tech ventures**.

100% Open's Toolkit is an excellent resource for collaborative and people-powered innovation. Two resources focused on international development, but relevant to others, are the **Principles for Digital Development** and the World Bank's **Practical Guide to Evaluating Digital Citizen Engagement**.

Design for Europe's **Nine Key Learnings** contains useful tips, advice and considerations about design-led innovation and will be particularly useful for DSI intrapreneurs within the public sector or larger CSOs.

PART I: Engaging users in your DSI initiative



Engaging people is fundamental to the success of DSI initiatives, which are social and collaborative and which benefit from network effects (the value to each user, and the overall social value, will increase as the number of users increases). In most cases, initiatives need to reach a critical mass of users before you can deliver impact to beneficiaries.

Engaging people is no simple task. It's easy to underestimate the time, skills and (almost always) money you need to invest. The five following questions will help you plan your engagement strategy.

1. Is there need, and is there demand?

Start by examining the problem you're trying to address. Rather than speaking to technologists, speak to those who have a deep understanding of the social challenges: frontline staff, commissioners, managers, policymakers, researchers, other social innovators and – most importantly – the people you are trying to help. The deeper your understanding of the challenge, the better you can design and develop your intervention.

Don't ask what technology can achieve; work out what needs to be done, and ask whether technology can do it quicker.

Secondly, examine if there is demand for your service. The first type of demand is financial: will someone pay for your intervention? The second concerns users: are there people who will use the tool, product or service (even if they take some persuading)?

To answer these questions, again you need to speak to citizens, commissioners, staff and policymakers - not other technologists.

If the answer is 'No', ask why: Is the social challenge not a priority for them? Do they doubt its potential impact? Is it too risky? Are you asking too much of them? Does a similar initiative already exist?

Work out what you need to do to turn the answer into 'Yes'. Be open to changing your plan if necessary – your original idea might not be the best idea.

Checklist

- [ ] Do you understand the social challenge in depth?
- [ ] Is there financial and user demand for your initiative?
- [ ] If demand is not forthcoming, will you be able to stimulate demand?

Databases such as **digitalsocial.eu**, the **Social Tech Guide**, and reports like betterplace lab's **trendradar** and Empodera's **annual guides**, will help you understand the landscape for your social area.

For more on business models, see Part 3, Question 3.

Peerby, a platform for asset sharing, was originally a borrowing platform. Later, it developed a rental model, which provided them with the revenue to acquire new customers and grow significantly.

2. Do you understand your users?

Next you must understand in more depth your users' characteristics, motivations and behaviour. This will enable you to engage with them in the right way at the right time.

Firstly, think down the line: if your initiative was working at scale, who would your users be? Would it ideally involve an entire population – such as a digital democracy platform where inclusion and representation is key? Would it be used primarily by a certain group, such as activists and campaigners, but open to everyone? Or would it be used by a certain group and closed to those outside that group, such as an online community for people with rare diseases or domestic abuse survivors?

Working this out now will ensure, on the one hand, that you're designing for scale from day one and embedding important factors like inclusion and safety; and on the other hand, it will make sure you're not wasting resources trying to engage communities or sections of society who you don't need to engage.

Secondly, think to the immediate future: who are your early users, the people who you will focus your engagement efforts on at the outset? This might be the people who will be most committed; who have time to spend using the initiative; who have specific knowledge to contribute; or who are affected most by the social challenge you're trying to tackle.

Thirdly, consider users beyond your immediate ones. For example, if you're developing a tool for policy deliberation, the government which will deal with the results is just as important as citizens. If you're developing a citizen science project, the researchers using the end data are just as important as the data generators. You need to bear these stakeholders in mind if you want to deliver impact.

For a guide to user research, check out **The UX Review's Beginner's Guide** or **UCL's overview of user research methods**. You might also like **UX Design's resources and articles on user experience**, product design and user research or **Invision's webinars on user experience, user engagement and user research**. You can find helpful resources on design, prototyping and behaviour design at **Hack Design**.

"I speak to people developing civic tech and ask how they are working with users to understand how they use it. You'd be shocked how few do."

Tiago Peixoto, **World Bank**

Finally, understand your users' motivations – they will vary significantly between initiatives. In some cases, users are motivated because they directly benefit from using the initiative: for example, mental health patients using an online peer support platform. In others, the initiative will depend on responsiveness from government, but still has the potential to benefit users: for example, local residents monitoring pollution to demonstrate to authorities the need for action. In others still, users are not direct beneficiaries, but are instead motivated by altruism, enjoyment, the opportunity to make new social connections, or the desire to learn new skills. If you know what motivates users – and there may be multiple reasons - you will be able to design a better initiative and engagement strategy.

Checklist

- [ ] Who do you want your users to be in the long-run?
- [ ] Who do you want to engage in the early stages?
- [ ] Who, beyond direct users of your initiative, do you need to consider?
- [ ] Do you know what will motivate your users to engage?

3. How will you make the user experience outstanding?

Once you know who you want to engage, you need to ensure the initiative you're developing is easy-to-use, enjoyable and inclusive. In short, you need to be better than your competitors. Most people don't use things they don't like to use – whatever the social impact.

Don't reinvent the wheel! Begin by asking what you can reuse and build upon, such as open-source software or freely available designs or ideas from other projects; the chances are the foundation of your product or service already exists. You just need to find it.

Build the best user experience by prototyping, experimenting and iterating, putting users at the heart of your development and using agile processes.

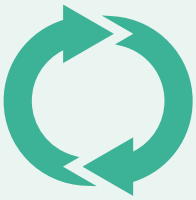
When working with your users, consider the following aspects of the user experience:

- **Barriers to entry**: You usually want these to be low, to encourage inclusion. In some cases, however, they need to be high. For example, making people pay for a product might encourage longer-term engagement because people have invested their own resources in it.
- **Aesthetics and ergonomics**: You need your technology to be aesthetically pleasing, easy-to-use, and enjoyable.
- **Accessibility**: Aim to make sure anyone, including those with disabilities, can use your technology.
- **Shareability**: Make it easy for users to share your initiative and engage other users.
- **Feedback capabilities**: Make sure users can feed back easily about the technology.
- **Privacy and security**: Your technology needs to be safe and secure. You need to know what data you're collecting from users, how you will store it, and how you will keep it safe.

"The only products that are able to have a real impact, because they reach a mass audience, are those that can compete with regular products, not just because they're sustainable, but because they are as good or even better than the other options."

Daan Weddepohl, Peerby

libraries.io is a discovery service which monitors over two million open-source libraries.



Safecast originally distributed radiation counters on a borrow-basis. Realising a lot of people weren't using or returning them, they began selling counters for around €550. *"Once people had to pay for the device, it meant they didn't stop using it, and the data coming back skyrocketed,"* says co-founder Sean Bonner.

You will never have a 'finished product' and you'll always need to be working to improve it. However, the more you test and refine in the early stages, the quicker you'll be able to grow your impact.

Checklist

- [ ] Have you identified existing open-source technology which you can reuse and adapt?
- [ ] Do you know who you'll work with – on the development and user side – to build and/or improve your initiative?
- [ ] Have you considered the barriers to entry, accessibility, shareability, feedback capabilities, privacy and aesthetic and ergonomic design of your technology?

Ease of use has been essential to the success of the **Smart Citizen Kit**, says project lead Mara Balestrini. *"Even a grandmother who has never used the Internet of Things could set one up!"* she says.

4. How will you engage your users?

You'll need to use different communication channels to engage people. Identify which channels of communication are best-suited to your users, such as social media and social networks, leaflets, print and online advertising, word of mouth, search engine optimisation, email or SMS. Are there ways you can incentivise users, for example through perks, gifts or public recognition?

Think also about offline engagement, which is often just as important as online engagement. With 45 per cent of EU citizens lacking basic digital skills, you'll cut out a significant chunk of potential users if you stick to online channels only.

Just as important as engaging users is maintaining their engagement. Here are a few tips to help you do so:

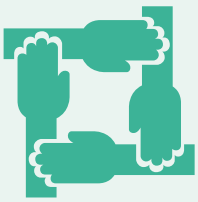
- **Give them a sense of ownership**. You can do this through discussion forums, communications, feedback mechanisms or user perks. At a governance level, you can consider structural decisions like co-operative ownership or co-budgeting.
- **Tell them the impact they're having**. Sometimes this will be obvious, but often it will require effort on your part. Tell stories and data through visualisations, infographics, social media, newsletters, videos, media coverage and in person.
- **Gain their trust**. Be open, transparent, honest and independent – and be vocal about it! Make sure people know how you're funded, what datasets you're using, who you're affiliated to, who you're working with, and how you're collecting, storing and using personal data.
- **Be honest**. Set expectations correctly and don't over-promise. For example, if you're engaging citizens in policy discussions, you need to be completely clear about what can change and where policymakers' red lines are.
- **Be clear**. Be clear about your and your users' roles and responsibilities, and stick to them.

Checklist

- [ ] Do you know which channels of engagement you will use?
- [ ] Have you thought about your offline engagement strategy?
- [ ] Have you considered how you will maintain engagement?

Although primarily aimed at commercial start-ups, there are valuable lessons in the chapter-by-chapter guides of **The Beginner's Guide to Online Marketing** and Ryan Gum's **Startup Marketing Resources**.

The City of Paris's **Madame la maire, j'ai une idée** programme was successful in part because of the significant investment in offline engagement, including workshops, groups and civil society-led activity. Two thirds of votes are cast offline.



Managing expectations was a key learning from the Smart Citizen Kit's journey to growth. During the first round of crowdfunding people were expecting a fully finished consumer product, when in fact it was more of a critical design prototype. This led to some disillusionment.

5. Who can help you to engage people?

You can increase your reach hugely by going through established routes and existing networks, rather than by trying to build your own. Collaboration is key to successful engagement.

You should already have an understanding of the social areas, technologies and places relevant to your initiative. Explore which existing organisations, such as charities, governments, politicians, celebrities, universities or companies, have existing networks and user bases. Get in touch to see how they can help, whether it's something small (such as including the initiative in their regular newsletter or tweeting about it) or something more substantial (such as a long-term partnership or collaboration). Seek out journalists and media organisations who could offer you media coverage. Throughout this process, you need to be persistent and, above all, creative.

To do this well, you need to have an 'elevator pitch'. How do you describe clearly and concisely what you do and what you want to achieve?

Checklist

- ☐ Have you identified organisations and individuals who might be able to help you engage people?
- ☐ Have you approached these organisations and individuals?
- ☐ Have you considered exciting ways in which you can build partnerships and access existing channels of communication?

When developing the 100 for Parkinson's citizen science app, **uMotif** worked with established partners such as Parkinson's UK to reach thousands of people. They also reached the general public through primetime media slots on the BBC and in national press.

In 2014, **Maker Faire** added the most powerful man in the world to its list of supporters, when President Barack Obama hosted the White House's first Maker Faire. When US charity **charity:water** recruited high-profile figures and celebrities to promote their work, they raised €16 million in donations in one year.

GoodGym, through which runners support older people in their communities, ran a series of prime-time TV adverts in partnership with New Balance. In 2014 it helped 350 older people; in 2018 it is on track to reach 30,000.

PART II: Understanding, measuring and communicating your impact

Understanding, measuring and communicating your impact is essential for three reasons. Firstly, and most importantly, it allows you to better understand your practice and its direct and indirect impacts, and to understand how your intervention affects and is affected by other interventions. It challenges you to articulate and interrogate your assumptions. Secondly, it will help you access partnerships, procurement streams, grant funding and investment. Thirdly, communicating your impact well will help engage more users.

Every initiative will approach impact in a different way, depending on its stage of development, the risk the initiative entails, the amount of existing research in the area, the timeframe over which it will deliver impact, its stakeholders, and the motivations behind the initiative's development in the first place. Therefore, we do not put forward a strict framework. The following questions, however, will support you to develop a structured approach to understanding, measuring and communicating your impact.

The Knight Foundation and Network Impact's extremely useful **Civic Tech: How to measure success?** is a practical guide offering examples and advice for monitoring platforms' ongoing performance using tools and approaches that are effective and practical.

1. What are you trying to achieve?

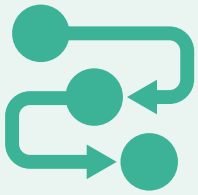
The first thing you need to be able to do is articulate the impact you are aiming to have concisely. How would you describe it in a sentence, a tweet or a tagline?

It sounds like a simple question, but it's of fundamental importance. Once you can do this, you can map how your intervention leads to this impact. The most common tool for this is Theory of Change, which maps inputs, activities, outputs, outcomes and impact along with assumptions. This will provoke you to interrogate your initiative, to identify your assumptions, and to question those assumptions. Furthermore, it's a good way to understand your secondary impacts, whether positive or negative, and the context into which your innovation fits.

Checklist

- [ ] How do you articulate what you're trying to achieve in a sentence, tweet or tagline?
- [ ] Have you mapped the theoretical underpinning to your initiative?

It's important to understand the difference between the inputs, activities, outputs, outcomes and impact. **INTRAC** has a very clear and accessible set of definitions.



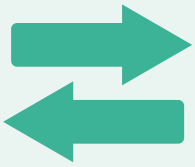
New Philanthropy Capital's **Practical Guide to creating your Theory of Change** takes you through the process from start to finish. The Social Investment Business's short **video introducing Theory of Change** is also very useful.

2. What can you learn from similar interventions?

To begin to understand your impact, you should draw upon existing research relating to similar interventions. As DSI is a relatively new field, you're unlikely to find research about very similar interventions, but you are likely to find projects and research in the same social area, or concerning similar target beneficiary groups.

Try to map who is doing similar work to you and understand how they approach impact. Research might be sitting in academic publications or on organisations' websites, or you might just need to drop an email to people whose work you're interested in. When you have located and understood some of this research, consider the following:

- Does it confirm or challenge your theoretical model and your assumptions?
- What can you learn from elsewhere to improve your own practice?
- Does it provide ideas about how you might measure your impact (such as metrics, methodologies or data practices)?



The Alliance for Useful Evidence has a number of resources on how you can use research to understand and improve your practice. Sections B and D of their Practice Guide to Using Research Evidence are particularly helpful. There are also sector-specific initiatives such as the Education Endowment Foundation, the Centre for Ageing Better and What Works Cities.

Checklist

- [ ] Have you identified research related to innovations which share characteristics with your initiative?
- [ ] Have you processed this information and thought about how it affects and could contribute to your theory, practice, and impact measurement plan?

3. How will you measure impact?

This complex question can be broken down into four different parts.

Firstly, ask yourself what your impact looks like:

- What would a 'success story' look like?
- What would be different about society if you delivered impact at scale?
- What could you measure to demonstrate impact? What outputs, outcomes and intermediate measures of impact can you use?
- What information do you need in order to confirm or reject the assumptions in your theoretical model?

Secondly, ask yourself what data you need to collect to demonstrate impact. This will include qualitative and quantitative data, including: stories and case studies; objective outcomes like health, educational, crime or homelessness outcomes, air quality or public spending allocation; surveys and questionnaires; data collected through your technology; data from other sources such as CSOs and the public sector; and media coverage. Consider also how you will collect baseline data (data on the situation before your initiative is put into effect), and whether it is feasible and appropriate to collect control data.

Thirdly, think about how you will collect this data. You want to make sure data collection is as simple as possible for you while still being accurate and reliable. Consider the following:

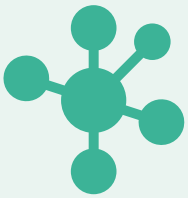
- **What definitions and categorisations will you use?** Are there standards or established ones which you can use rather than coming up with your own?
- **How can you avoid duplication?** Is someone else collecting and publishing the data you need, or can you use the same data for multiple purposes?

Good Finance's **Outcomes Matrix** helps you select the relevant outcomes and measures for your impact area. From this, you can create your own unique and customisable set of outcomes.

Nominet Trust's **Lean Social Metrics** take lessons from commercial digital innovation to help you evaluate your social impact using appropriate and purposeful metrics which are designed to be manageable even by early-stage ventures.

- **Are you only collecting the data you need?** You should not spend time collecting data which will not serve a clear purpose.
- **What data is automatically being collected through your technology?** Could other data collection processes be automated and/or built in?
- **How will you design surveys, interviews and questionnaires rigorously?** How will you encourage participation?
- **How will you collect standardised and discrete data as far as possible?** This will make analysis much easier.

Finally, ask yourself how you will make sense of the data. There's little point collecting data if you don't know how to make sense of it. This is especially the case with data collected through automated processes and big data. You may need to learn new skills, use specific software, or work with people or an organisation to make the most of your data.



"Data collection must be relevant, otherwise it is a distraction. The last thing you need as a startup is a distraction. All data needs to be decision-focused: you need to know how it will be used."

Daniel Robinson, Nominet Trust

Checklist

- [ ] Can you explain what success looks like for users and for society?
- [ ] Do you know exactly what you need to measure?
- [ ] Have you planned to collect data as efficiently as possible?
- [ ] How will you make sense of the data you collect?

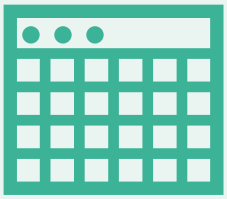
4. How will you communicate your impact?

Just as important to understanding and being able to demonstrate your impact is the ability to communicate it effectively to different stakeholders.

You should already know who your different stakeholders are: users, beneficiaries, funders, investors, the public, policymakers, public sector organisations, civil society organisations, the open-source community, your supply chain, clients, and maybe more.

Speak to different groups of stakeholders to understand how best to communicate your impact. Some might want stories, others might want statistics, others might want raw data. When possible, repurpose data for these different stakeholders ("collect once, use many times").

Develop a plan which both the needs of your stakeholders but which is also manageable for you, and work out what channels of communication are suitable for those stakeholders, such as online communications, periodic impact reports, case studies or a dedicated section on your website.



Checklist

- [ ] Do you know what your different stakeholders want to know?
- [ ] Do you know how you will communicate it to them?
- [ ] Do you have a plan for this to be as efficient a process as possible, repurposing data where possible?

5. How will this help you to improve your practice?

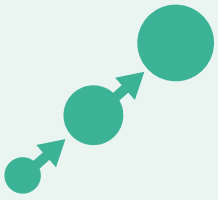
As discussed at the beginning of this section, the primary reason to understand and measure your impact is to help you increase your impact.

If you have collected the right qualitative and quantitative data, you should be able to draw conclusions to the following questions:

- Is your intervention delivering the impact you want it to deliver, or likely to do so further down the line?
- Are there particular aspects of your intervention which are key to delivering impact, or which are holding back impact?
- Which aspects are more or less popular among users and beneficiaries?
- Are your original assumptions backed by the information you've gathered, or do you need to interrogate them more?
- Are you collecting the right information, in the right way?
- If the evidence suggests you're not having the impact you want to have, what do you need to change? Is there something wrong with the theory underlying the intervention, or is it a question of improving implementation?
- If the evidence suggests you are having little or negative impact (which we hope isn't the case!), should you be continuing?

From here, you can begin to develop the initiative, to improve and streamline your data collection processes, and to share your findings so that others can learn from you and benefit from a culture of reuse. In this way, you will be able to grow your impact in the most efficient way possible, gain more confidence from your stakeholders, and empower others to also deliver impact to address pressing social challenges.

mySociety is a leader in employing rigorous research to understand its impact, and to develop its practice accordingly. The section on their website dedicated to research is both informative and accessible.



Checklist

- [ ] Have you looked at your impact data to understand the strengths in your innovation and where there is room for improvement?
- [ ] Have you got a plan to develop your practice accordingly?

PART III: Planning for growth and sustainability

Growing your initiative and its impact will not be a linear process, but that does not mean you can't plan for it. Indeed, evidence suggests that innovations which plan for scale at the early stages are those which go on to succeed.[335] If you can answer the following questions, you will be well set-up to grow your innovation and achieve impact at scale.

Nesta's **What does it take to go big?** report is focused on social action projects rather than digital social innovation, but is extremely useful for thinking about the different stages of the growth process.

1. Are you ready to grow your innovation?

If you try to grow before you're ready, you may well run into trouble later on. Consider the following questions:

About your innovation

- Do you thoroughly understand your innovation, and what your 'core model' is – the parts which need to stay the same to deliver impact?
- Conversely, do you understand which aspects of your innovation can change as you grow, and which aspects will need to change to fit new contexts?
- Do you have reliable and accurate feedback about who your users are, how they're using your product, tool or service, and what they think of it?
- Do you have objective evidence of impact that is not dependent on unique leadership or circumstances?[336]
- Is your technology robust enough to cope with many more users?

The DSI4EU Sustainability Toolkit, developed by SUPSI, is particularly useful for early-stage projects, and will support you to self-assess your initiative from different perspectives. The toolkit takes an Open Design approach and is one of the few DSI-specific resources.

Your organisation

- Do you have an organisational structure?
- Are your administrative, financial, legal and communication processes robust enough to cope with many more users, and to benefit from economies of scale?
- Do you know which skills (like communications, customer service, marketing or administration) you'll need, and how you'll access and pay for them?
- Do you have funding for growth, or at least know where you might access it?
- Are you, as an individual or a team, ready to take on greater responsibilities and an increased leadership role?

Your targets

- Do you know where you want to focus growth (geographically or with a particular community, for example)?
- Do you understand the political, economic, social and cultural context of the new geography or community?

If you can answer all of these questions with a 'Yes', you should be ready to grow. If not, you should consider consolidating your current operations and impact before looking to grow your impact.

Checklist

- [ ] Can you answer 'Yes' to all of the questions above?

2. Which route to growth will you follow?

There are numerous different routes to growth for DSI initiatives. The right one for you will depend on the nature of your initiative, the business model you pursue (see Question 3) and the amount of control and ownership you want to maintain over the initiative.

Below are a few examples of routes to growth; your route might combine different aspects from these. As DSI is a young field, this is by no means a comprehensive list.

1. **Increasing use of your tool, product or service**, which is the most common route to growth, especially for platform-based, product-based and peer-to-peer DSI initiatives. It can happen in different ways: selling more units of a product, engaging more users on a platform, increasing the frequency and intensity of use by your existing user base or accessing public contracts and partnerships.

   For example, **Fairphone** has now sold over 125,000 devices and there are now over 2,000 citizen-sensing **Air Quality Eggs** around the world. **Apps For Good**, which supports young people to develop social technology apps, has grown from seven schools in 2010 to over 1,500 today, supporting 75,000 students. **Peerby** has grown its user base to 250,000 people, while **Wheelmap**, a crowdsourced map of wheelchair accessibility, has mapped over 750,000 places in seven years. **GoodSAM** has been integrated into three ambulance trusts, and is due to be live in five trusts by the end of 2018. **Citizen Space**, a cloud-based platform for public consultations, has run over 10,000 consultations with over 100 organisations globally.

2. **Open-sourcing your technology and disseminating know-how**, which is more common in DSI than other forms of (social) innovation. By open-sourcing technology, you will allow for growth in other contexts and places, but you will also give up significant control over your initiative. Initiatives which open-source their technology often also develop resources such as toolkits, guides or kits so that other people can understand the technology better, or they offer paid-for services for implementation.

   For example, **Precious Plastic** has developed an open-source machine, along with a 'starter kit' to help people on their way. London-based charity **Hello World** has developed Hello Hubs, community-built, off-grid internet kiosks for education and development, which are open-source and accompanied by tutorials and instructions. They have benefited over 4,000 people in developing countries. Citizens Foundation and mySociety offer open-source civic engagement tools complemented by consultancy services to support implementation.

3. **Affiliation** offers a way for you to maintain some control of your initiative while also allowing others to lead development, implementation and delivery in different contexts. Through affiliation, you can create a network of initiatives which are able to adapt to specific conditions but also share best practice, learn from each other, and share values and aims.

   For example, there are now almost 200 Maker Faires across the world, led by the community through an affiliation model. Similarly, **Open Knowledge International** has over 40 local chapters and groups, founded by individuals who commit to specific responsibilities and values and who in return receive support from the central organisation. **Code for All** is a network of organisations which all operate under five shared principles, and now contains 13 partner organisations, four of which are European.

4. **New products and services** are another route to growth, although this is rarer and is usually undertaken by organisations which are already operating their primary initiative at a large scale.

   For example, Safecast, a platform for collecting data about nuclear radiation, has recently started piloting sensors to measure PM10, PM2.5 and PM1 particle pollution, which will allow them to tackle environmental pollution from different angles and at a larger scale.

5. **Effecting change in others' practice or changing policy** can, in some cases, allow you to grow very quickly. For example, if you can work to make a government or charity release a certain dataset you may massively be able to increase the reach, and in time impact, of your initiative.

   For example, **Open Corporates** was instrumental in lobbying the UK government to releases a dataset of beneficial ownership, increasingly massively at a stroke the amount of data on the platform. They are now working with partners to get other countries to do the same. **ProZorro** is a Ukrainian e-procurement platform which began as a volunteer-led project. Within just two years, it had become law for all public procurement to go through ProZorro.

Checklist

- [ ] What route are you going to pursue to grow your impact?

3. How will you be financially sustainable?

Finding business and income models for growth and sustainability is one of the biggest challenges faced by DSI initiatives. Many DSI practitioners do not want to develop predominant digital business models which rely on restricting and monetising data or on advertising. In some ways, financial sustainability is *the* big question in DSI.

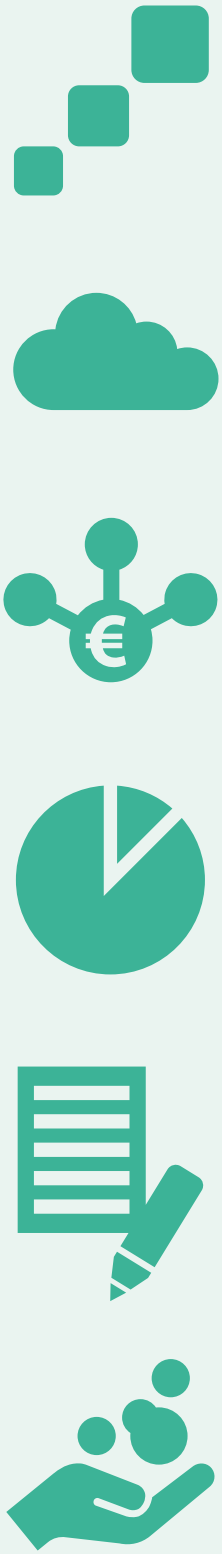
Below is a list of promising business and income models for DSI, alongside examples of DSI initiatives which have followed those business models. As for routes to growth, a combination of elements from these might work best for you, and you may have to experiment with different models before finding the one that's right for you.

Market-based models

- **Selling a product.**
  For example, this is a major source of income for the Smart Citizen Kit and Fairphone.
- **Selective pricing.**
  For example, Open Corporates offers free access to its API for people who will make their findings open, but charges those who do not share their findings, for example commercial and proprietary clients.[337]
  If you follow this route, it is important to have clear boundaries about what is charged, when, and to whom.
- **Cross-subsidy.**
  For example, Open Knowledge International has offered consultancy services for some years, the profits of which subsidise its charitable work. In 2016, it formally spun off its for-profit arm into a new entity, **Viderum**. If you follow this route, there must be clear division of for-profit and charitable work, and a clear understanding about what work you will and won't do.

Although not specific to digital initiatives, MaRS's guide to **Social Purpose Business Models** provides more information and inspiration for your own work. **Nominet Trust's Canvas**, along with the supporting paper, will help you to understand your user value, social value and financial value on one piece of paper.

- **Freemium models.**
  For example, the MOOC platform **FutureLearn** offers all courses free of charge. However, users must pay a subscription to access extra features such as certificates of completion.
- **Software as a service (SaaS).**
  For example, GoodSAM, which links first responders to those in need of emergency help, offers subscriptions on an annual basis to ambulance services. **Delib** and **CitizenLab**, both citizen participation platforms, offer annual subscriptions to governments. If you follow this route, you must bear in mind the need for dedicated sales, account management and support teams.
- **Monetisation of data.**
  For example, **WeFarm** is an SMS-based peer-to-peer platform for smallholder farmers to learn from each other. WeFarm collects data and sells it to agribusinesses, which can then understand the challenges facing farmers and improve their supply chains. Similarly, **Patients Like Me**, a patient social network, enables peer-to-peer interaction but also sells aggregate data to pharmaceutical companies and the US Food and Drug Administration. If you follow this model, data privacy, transparency and reputational risks are very important considerations.[338]
- **Transaction fees.**
  For example, crowdfunding platforms such as **Spacehive** and peer-to-peer platforms such as Peerby take a small amount of commission from transactions taking place.
- **Service contracts with the public sector and charities.**
  For example, **Casserole Club**, which facilitates meal-sharing with older people, is used as a contracted service by local authorities in England.



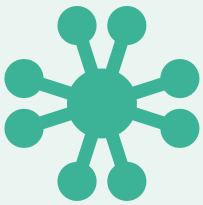
Non-market-based models

- **Donations and crowdfunding.**
  For example, **Wikipedia** and mySociety rely partly on donations from members of the public, while the Smart Citizen Kit, Safecast and Peerby have all held highly successful crowdfunding campaigns. Crowdfunding is often better-suited to discrete projects than general running costs.

- **Volunteer and pro bono labour.**
  For example, Precious Plastic is run by a team of just three people with the majority of expertise coming from the online community of volunteers. Harnessing the power of the crowd is central to many DSI initiatives and also offers a way for them to remain sustainable. It is also possible to use pro bono labour for specific areas such as legal and financial support. However, relying on volunteers requires significant co-ordination and management, and the work may not always be of the highest quality or 100 per cent reliable.

- **Long-term grant funding.**
  For example, Safecast, Open Knowledge International and mySociety are just three organisations which have secured long-term grant funding from foundations and the public sector to keep their work going. They do not rely on grant funding as a sole means of income, but it is still essential to their sustainability.

- **Consortium/corporate membership models.**
  For example, the **Wikihouse Foundation** offers different tiers of membership to individuals and organisations, ranging from 'members' to 'partners' and 'core partners'. The different tiers receive different benefits, access to technology as it is developed and public recognition.



Checklist

- [ ] What business model are you going to pursue to grow your impact?

4. Who can you work with to grow your impact?

Just as you can engage more people by working with existing organisations and bodies, you can grow your impact more quickly and effectively by tapping into others' expertise and experience.

Work with other organisations like charities, sector-specific groups and corporates offering pro bono services to access advice, information and technological, communications and administrative support. This will also provide access to new delivery streams, reputational boosts, retail channels and events.

Finally, think about who you can call upon for advice, whether informally or by putting together a formal advisory board or steering group. Whatever challenges you will face as you grow, someone else will probably have faced them before. Talk to people in and beyond your field, build new networks and try to identify people who have experience and expertise for you to draw upon. You won't be the first person to encounter a problem, and you won't be the last. Use this to your advantage!

Through the **digitalsocial.eu** website you can find other projects and organisations working near you, or in the same social area, or using the same technology. You can do this through searches and through an interactive data visualisation. The platform also publishes case studies and blogs.

Checklist

- [ ] Have you identified organisations you can work with to support growth, and have you reached out to them?
- [ ] Have you identified individuals who might be able to provide advice and support?

Conclusion and further reading

We hope these guidelines have been useful to you. As we said at the beginning, they're just a first version of an incredibly broad topic, and we'd welcome any feedback via email (dsi@nesta.org.uk) or Twitter @DSI4EU.

Below is a list of resources we're particularly fond of. There is no way we could have included all the useful resources which could help digital social innovators, so do keep looking around, and please drop us a line if you come across anything you think we should know about.

General resources

- **DIY Toolkit** | The DIY Toolkit includes tools to help you understand the basics, develop your plan, clarify your priorities, collect input from others, know the people you're working with, generate new ideas, and to test, improve, sustain and implement your social innovation. Available in multiple languages.
- **DSI4EU Sustainability Toolkit** | Developed as part of the same project as these guidelines, this toolkit supports you with self-assessment of different aspects of your initiative and provides a guide for peer-to-peer mentoring.
- **Six tenets of tech for good** | An outstanding blog from CAST setting out six tenets for social good: A culture of reuse; User led, and test-driven development; Creating three strands of value; Lean metrics and ongoing testing; Smaller problems for bigger solutions; and Addressing challenges, not suggesting solutions.
- **100%Open Innovation Toolkit** | Guides open innovation practitioners through the three stages of exploring (setting strategy and finding insights), extracting (discovering ideas and creating prototypes) and exploiting (developing propositions and making business models).
- **Social Innovator** | This platform includes resources and case studies on the processes of social innovation, networks and collaborations, and support for social innovation.
- **Design for Europe: Nine Key Learnings** | Although primarily aimed at public sector and business practitioners, these guidelines contain useful tips, advice and considerations about design-led innovation. They may be of particular use to DSI intrapreneurs within the public sector or CSOs.
- **The Question That Tech-for-Good Funding Should Care Most About** | Excellent blog from Shift Design outlining milestones for social tech development.
- **5 Lessons in Developing Social Tech Ventures** | Another outstanding blog from Shift Design.
- **From principle to practice: Implementing the principles for digital development** | Primarily intended for development work, but an excellent set of principles for social technology across the board.
- **Evaluating digital citizen engagement: A practical guide** | This guide provides practical steps to assess the extent to which digital tools have contributed to citizen engagement.

Resources for Part I

- **User research: the beginner's guide** | A helpful introduction to user research.
- **UXdesign.cc** | A curated collection of resources and articles on user experience, product design and user research.
- **Invision webinars** | A set of webinars, freely available on sign-up, about various concepts to do with user experience, user engagement and user motivations.
- **Hack Design** | A selection of blogs, books, games, videos and tutorials about design, including lessons on user experience, prototyping, graphic design, user interfaces and behaviour design.
- **Understanding your users** | An overview of different user research methods including an overview video.
- **The Beginner's Guide to Online Marketing** | Although aimed at commercial startups, this provides chapter-by-chapter guides to developing and implementing a marketing strategy.
- **Startup Marketing Resources** | Aimed at commercial startups, but provides an extensive list of resources about communications, marketing, SEO, analytics and PR.

Resources for Part II

- **Good Finance Outcomes Matrix** | A tool to help you identify outcome areas, beneficiary groups and metrics.
- **Better Evaluation** | An international collaboration to improve evaluation practice and theory by sharing and generating information about options (methods or processes) and approaches. It offers support across the whole journey from defining your impact to reporting and spreading your knowledge more widely.
- **Measuring your social impact: Theory of Change** | A two-and-a-half minute video introducing the concept of Theory of Change.
- **Creating your Theory of Change: NPC's Practical Guide** | This guide supports you to create and represent your Theory of Change, and to use it to create a measurement framework and learn and improve as you go on.

Resources for Part III

- **Measuring up!** | A self-assessment tool to help you review and improve your organisation's impact practice. Versions available for small organisations, medium-to-large organisations, and funders.
- **Lean Social Metrics** | This paper explores how social tech ventures can evaluate their social impact using appropriate and purposeful metrics which are designed to be manageable even by early-stage ventures.
- **Using Research Evidence: A Practice Guide** | Although primarily intended for decision-makers in government, charities, voluntary organisations, professional membership bodies and local authorities, sections B and D of this guide may be useful for you to understand and find existing research evidence related to your intervention.
- **NT Canvas** | Nominet Trust's Canvas and supporting paper help you to understand your user value, social value and financial value on one piece of paper.
- **Social Purpose Business Models** | This guide provides a short introduction to thinking about a business model for your innovation.
- **Alliance for Useful Evidence** | Dedicated to better use of evidence in policy and practice, the A4UE has a number of publications and resources to help you understand evidence relevant to your initiative.
- **What does it take to go big? Insights on scaling social innovation** | This report shares findings from Nesta and the UK Cabinet Office's Centre for Social Action Innovation Fund. Although it is not a guide, it includes sets of questions about scaling and the insights it contains are extremely useful to social innovators.

ENDNOTES

Executive Summary and Introduction

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319. Variables which will affect impact approaches include:
Stage and reach of development. Impact approaches must be proportionate to the intervention's stage of development and reach; a service operating through a large public contract will need robust quantitative and qualitative processes, while a light-touch qualitative approach is more appropriate for an early-stage innovation going through iterations and changes. This is particularly important for DSI, where time needs to be given for networks to grow and impact to be delivered as network effects are realised.
Novelty and risk of the innovation. Innovations which build upon existing products, services, processes or methods, or which can draw upon existing research and impact evidence for comparable interventions, will take a different approach to impact than those which entail more risk. If evidence and research suggests the intervention would be effective, there's less need to collect lots of data. For high-risk, or less well-evidenced, interventions, practitioners will need to put more effort into understanding impact and have a more robust research approach.
Social area. Different social areas have different thresholds for impact measurement. In healthcare, where the threshold of evidence is very high, an RCT is often necessary; in an area like digital democracy, which is largely driven by political agendas, the need for robust impact measurement is lower.
Audience. Impact needs to be measured and communicated in different ways to different audiences - from robust qualitative and quantitative data for the public sector and investors to relatable stories for engaging with the public.
Timeframe. Some interventions (such as disaster emergency responses) will be able to evidence impact very quickly. In other cases (such as climate change initiatives) impact may take months or years to be measurable.
Motivation. Practitioners' motivations impact their approach to measurement. For example, in digital democracy projects, the primary motivation might be to engage people in democratic processes as an end in itself; it might be to create better or new public policy; it might be to make democracy more inclusive; or it might be to make government more accountable. In each of these cases, the processes and metrics used to measure impact will vary.
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p.19: DSI organisations in Europe, screenshot from digitalsocial.eu/viz/

p.20: DSI4EU, screenshot of digitalsocial.eu homepage

p.21: Logos, TechSoup Europe, Danish Design Center, La 27e Région, ZSI, Open Knowledge International, Fab Lab Barceona, The Internet of Things Council, betterplace lab, The ODI, Sozialforschungsstelle Dortmund, TransparenCEE, ePaństwo Foundation, Empodera, Cibervoluntarios.

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p.38: Precious plastic, plastic items. From: https://preciousplastic.com

p.39: Martel Innovate, DSI Fair 2017. From: https://dsifair.eu/photos/#jp-carousel-731

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p.41: Logos, Nesta Impact Investments, Quadia, Citizen Capital, Big Issue Invest, Caisse Solidaire, Mustard Seed, Creas, Kois Invest, Triodos Bank.

p.43: Rainbow Unicorn, Prototype Fund promotional material. From: https://twitter.com/prototypefund/status/822467142394191872

p.44: Goteo Foundation, Match Funding iPad mockup.

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p.50: Réinventons Liège, Screenshot from https://www.citizenlab.co/blog/news/the-city-of-liege-reinvents-itself-with-citizenlab/

p.51: Unreasonable Institute, map of accelerators 2015-17.

p.52: Bethnal Green Ventures, cohort workshop. From: https://www.instagram.com/bethnalgreenventures/

p.52: Fairphone, Bethnal Green Ventures team with Fairphones. From: https://www.fairphone.com/en/2014/02/03/fairphone-the-next-steps-from-2013-to-2014/ (CC BY-NC-SA)

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p.60: Fab Lab Barcelona | IAAC, Ada Colau meets Tomas Diez.

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p.82: betterplace lab, trendradar. From: https://www.saint-elmos.com/en/press/details/article/digital-soziale-innovationen-auf-dem-schirm-saint-elmos-legt-fuer-den-partner-betterplace-lab-den-trendradar-neu-auf/

p.82: Nominet Trust, NT100.

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p.84: Logos, MK:Smart and Our MK.

p.84: Our MK, Promotional poster. From: https://communityactionmk.org/2016/09/15/funding-for-citizen-innovators/ (CC BY-NC-SA)

p.85: Our MK, Workshop. From: https://communityactionmk.org/2016/07/13/citizen-innovators-collaborate-in-mk/ (CC BY-NC-SA)

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p.86: mySociety, Fix My Street app. From: https://www.fixmystreet.com/faq

p.87: mySociety, TICTec2016 April 27th-365. From: https://www.flickr.com/photos/mysociety/26541335700/in/album-72157669443532486/ (CC BY)

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p.90: Nominet Trust, Triple Helix of social tech innovation. From: https://hackernoon.com/six-tenets-of-tech-for-good-210168573f87

p.91: Nesta, steps. From: www.nesta.org.uk

p.92: Logo, Impact Management Project.

p.93: Fab City, screenshot from http://dashboard.fab.city/

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p.96: Serena Cangiano, Toolkit workshop.

p.97: Serena Cangiano, DSI cards and badge.

p.97: Serena Cangiano, opencare at Maker Faire Rome.

p.98: Image from pexels.com. (CC0)

p.99: Image from pexels.com. (CC0)

p.100: Smart Citizen, Smart Citizen Kit. From: https://docs.smartcitizen.me/#/

p.101: Making Sense, workshop. From: http://making-sense.eu/towards-minimum-viable-open-manifesto-2/

p.102: Making Sense, Stall in Pristina. From: http://making-sense.eu/winter-coming-air-pollution/

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