Deliverable D5.1 – Accessibility of ICT tools

Project Full title	Generative European Commons Living Lab
Project Acronym	gE.CO Living Lab
Grant Agreement No.	822766
Coordinator	University of Turin
Project start date and duration	February January 2019 - December 2021
Project website	https://generative-commons.eu
Deliverable Nr.	5.1
Deliverable date	30/11/2021
Work Package No	WP5
Work Package Title	gE.CO Assessment
Responsible	Sean Peacock, Vasilis Vlachokyriakos, Clara Crivellaro, Sarah Armouch
Authors & Institutes Acronyms	UNEW
Reviewers	
Status:	Draft
Dissemination level:	Confidential

Versioning and contribution history

Version	Date	Comment	Authors
v.01	2.8.2021	First version of the report's structure and content	Sean Peacock
v.02	3.8.21	Populated data analysis and background sections	Sean Peacock
v.03	10.9.21	Finalised analysis and added usability recommendations	Sean Peacock
v.04	20.10.21	Incorporated feedback for data analysis and condensed insights section	Sean Peacock
v.05	17.11.21	Re-structured and proofread report and added further details in the last section	Sarah Armouch
v.06	18.11.21	Sense checked document and added	Vasilis Vlachokyriakos

		details on next steps for community engagement	

Increasing accessibility of ICT tools

Final Report

30/11/2021

Table of Contents

1. Introduction 1
2. Methodology and process 1
  2.1. Background work on ICT tools for commons 2
  2.2. Methodology 8
3. Usability testing 8
  3.1. Methods and approach 9
  3.2. Usability study findings 10
  3.3. Changes implemented following usability testing 10
4. Empirical data collection 11
  4.1. Qualitative research methods 11
  4.2. Research findings 16
5. Implications and recommendations from our work 25
  5.1. Recommendations from our usability study 25
  5.2. Recommendations from our community research 26
  5.3. Continuing community engagement after the research 27
6. Appendices 28
  6.1. Jacob Nielsen's 10 Usability Heuristics 28
  6.2. Usability testing findings 28
  6.3 Usability testing reports 37
  6.4. Interview schedule and list of participants 53
  6.5. Workshop schedule and list of participants 55
  6.6. Workshop promotional flyer 56
  6.7. Presentation to the gE.CO consortium in Zaragoza, 21/9/21 57

1. Introduction

The gE.CO Living Lab aims at creating a platform which brings together and supports formal groups or informal communities of citizens who manage fab-lab, hubs, incubators, co-creation spaces, social centres created in regenerated urban voids. These innovative practices are considered 'generative commons' because they are based on sharing and collaboration between citizens and establish a new partnership between Public Institutions and local communities, setting forth new models of governance at urban dimension based on solidarity, inclusion, participation, and economic and environmental sustainability.

Deliverable 5.1 of the gE.CO Living Lab project centres on increasing the accessibility of ICT tools. Two core strands of work have taken place in order to achieve this. The first strand of work builds on deliverable 2.3 to test the ICT tools developed and maintained by Newcastle University (UNEW) throughout the gE.CO project. In order to understand how well they work and what uses they could potentially offer groups and communities, these have undergone usability testing. Usability testing is a common approach to understanding how well software tools work for their intended purpose. Alongside this, documentation has been curated to support the use of these tools by groups and communities.

The second strand of work involved a deep-dive research with community groups in the North East of England. This sought to complement the research conducted by project partners across Europe to learn more about the practices and outputs of organisations creating commons, how they are currently using digital technologies in their work, and how we might design digital technologies to support the generative production of commons. Methods for this have included interviews, a workshop and other community engagement work.

The report aims to introduce the topic of commoning and digital technologies, explain the methodology and analysis of the work undertaken for this deliverable, and provide recommendations. Section 2 sets out our general methodology and process with reference to background work on urban commons and ICT tools and our design of the gE.CO digital toolbox.

Section 3 reflects our usability testing of the gE.CO digital toolbox, which we did to understand from a technical perspective how effective the tools might be for supporting generative commons. This section sets out the methods for our usability study (3.1), our findings (3.2), and the actions we have taken to remedy issues that are in scope for us to address (3.3).

In Section 4, we thoroughly describe our community research, which we did to understand from a socio-technical perspective how communities access ICT tools for commoning work and the opportunities and challenges they encounter. This section first elaborated on the methods adopted (4.1), including: interviews (4.1.1), a follow-up workshop (4.1.2), and data analysis (4.1.3), before reporting on the findings (4.2). We conducted a thematic analysis of the data, which generated three themes (4.2.1 - 4.2.3).

In Section 5 we propose recommendations from our usability study (5.1), along with the implications and recommendations from our community research (5.2). We close with description of our next steps (5.3). We also include appendices at the end with additional supporting information.

2. Methodology and process

This section explains the methodology and process for the work conducted as part of deliverable 5.1. We explain this in relation to the deliverable's aim of increasing accessibility of ICT tools and build a case from the literature explored.

2.1. Background work on ICT tools for commons

This section discusses background work on urban commons and questions of access around ICT tools. The background work is divided into three parts: interpreting the urban commons (2.1.1); the increasing role of ICT tools (2.1.2) and questions of access around ICT tools for supporting commons (2.1.3).

2.1.1. Interpreting the urban commons

The commons refer to a set of practices that involves creating, managing and sustaining the available resources in a community for collective, not private, interests. Historically, this has referred to natural resources, such as land, sea and air, but the concept has been extended to consider other physical and cultural resources in society, as well as the management of urban areas through **urban commons**. Interest around commons has grown over the last ten to fifteen years, as the world's population has increased, the climate emergency comes into greater focus and advanced economies look for alternatives to government-imposed austerity following the 2007-8 financial crisis[1].

For Dellenbaugh-Losse et al[2], commons involve three main things: resources, people and commoning. Commons' **resources** can be material or immaterial and are "*non-commodified means of supplying some good or service to the commoners*". Such resources have boundaries for their use, and are therefore not necessarily open access or free-for-all[3]. In commons, **people** are the commoners – "*the group of individuals who are involved in the production and reproduction of commons*". Often self-defined and formed organically, people are key to managing the commons and enforcing boundaries and rules about how it is used. **Commoning** is the practice of managing such resources for social benefit, both for the commoners and those in the wider community. In commoning, the commoners directly "*negotiate and renegotiate the rules about boundaries, use forms and intensities, and penalties for breaking the rules*[4]". This management also involves norms, values and practices that maximise community benefit. This makes it distinct from other forms of management following market principles of private ownership or by an administrative body (e.g. government).

In his 1968 article 'The Tragedy of the Commons'[5], the ecologist Garrett Hardin posited that freedom to access and govern common pool resources would inevitably fail due to self-interested parties not taking care of it and instead depleting it for personal gain. While this is an important concern of commons initiatives, many have drawn attention to its ignorance of social dimensions, its thinly veiled defence of private property and his political motives[6,7]. Most notably, Nobel Laureate Elinor Ostrom argued that a tragedy of the commons could be easily avoided through proper management of the resource. Moreover, she argued that managing resources on a commons model can be more efficient and sustainable than market or state approaches[8]. Ostrom put forward eight principles around use, governance and conflict resolution for successful commons[9]. However, geographer David Harvey points out that Ostrom's work is drawn from an analysis of natural resources on a small scale. In contrast, research on the urban

[1] Dellenbaugh-Losse, M., Zimmermann, N.-E., de Vries, N., 2020. The Urban Commons Cookbook.
[2] Dellenbaugh-Losse et al, 2020
[3] Williams, M.J., 2018. Urban commons are more-than-property. Geographical Research 56, 16–25. https://doi.org/10.1111/1745-5871.12262
[4] https://urban-policy.com/2017/09/18/what-makes-urban-commons-different/
[5] Hardin, G., 1968. The Tragedy of the Commons. Science 162, 1243–1248. https://doi.org/10.1126/science.162.3859.1243
[6] Harvey, D., 2011. The Future of the Commons. Radical History Review 2011, 101–107. https://doi.org/10.1215/01636545-2010-017
[7] Southern Poverty Law Center (n.d.), https://www.splcenter.org/fighting-hate/extremist-files/individual/garrett-hardin
[8] Shareable (Ed.), 2018. Sharing cities: activating the urban commons. First edition.
[9] https://www.thenatureofcities.com/2017/08/20/ostrom-city-design-principles-urban-commons/

commons is relatively new, and greater understanding and experiments are needed to think through how to enact urban commons at scale in the context of the city [10].

Over the last 20 years, urban commons have gained legitimacy as an alternative form of urban management among communities, policymakers and researchers[11,12], propelled by increasing institutional and legal support and the work of grassroots initiatives. Urban commons bundle up the ideas and approaches behind the commons to think about how city resources can be managed as common resources. At the heart of urban commons is enabling citizens, and not governments or private companies, to manage resources in an equitable way. In an urban commons' scenario, resources including land, housing, food, infrastructure, finance, and technology are created, managed and sustained fully, or in part, by the community benefitting from the resource[13,14]. Yet, urban commons are as much about as the 'activity' of commoning as actually creating resources, as scholars observe that commoning pursues ways of managing cities that challenge the hegemony of public and private management and recentres values of accessibility, responsibility and care in city management[15,16,17]. For Miriam Williams, it is these ongoing practices of commoning that "*perform the commons into being*"[18], while for Marttilla et al., commons can be thought of "*as a vehicle for social change and democratic governance*" rather than simply resources to be shared or managed[19]. Urban commons are inherently political as they are often sites of political struggle, negotiated between various urban actors in tension, and many urban commons are expressions of collective action against capitalism, dominant interests of private property ownership or the threat of enclosure[20,21,22].

As digital technologies become increasingly bound up with our experience of cities (for example, through the proliferation of personal technologies like smartphones and ubiquitous technologies that assist cities in managing urban resources [23]) and support new forms of distributed urban action (for example, through social media, crowdfunding platforms and participatory budgeting) it is also important to understand the role that they can play in creating and sustaining urban commons[24].

---

[10] Harvey, 2011

[11] Shareable (Ed.), 2018. Sharing cities: activating the urban commons. First edition.

[12] Marella, M.R., 2017. The Commons as a Legal Concept. Law Critique 28, 61–86. https://doi.org/10.1007/s10978-016-9193-0

[13] Shareable (Ed.), 2018. Sharing cities: activating the urban commons. First edition.

[14] Foster, S.R., 2011. Collective Action and the Urban Commons. NOTRE DAME LAW REVIEW 87, 79.

[15] Linebaugh, P., 2008. The Magna Carta manifesto: liberties and commons for all. University of California Press, Berkeley.

[16] Bellacasa, M.P. de la, 2017. Matters of Care: Speculative Ethics in More than Human Worlds. U of Minnesota Press.

[17] Mattei, U., Quarta, A., 2015. Right to the City or Urban Commoning? Thoughts on the Generative Transformation of Property Law 25.

[18] Williams, M.J., 2018. Urban commons are more-than-property. Geographical Research 56, 16–25. https://doi.org/10.1111/1745-5871.12262

[19] Marttila, S., Botero, A., Saad-Sulonen, J., 2014. Towards commons design in participatory design, in: Proceedings of the 13th Participatory Design Conference: Short Papers, Industry Cases, Workshop Descriptions, Doctoral Consortium Papers, and Keynote Abstracts - Volume 2, PDC '14. Association for Computing Machinery, New York, NY, USA, pp. 9–12. https://doi.org/10.1145/2662155.2662187

[20] Foster, S.R., 2011. Collective Action and the Urban Commons. NOTRE DAME LAW REVIEW 87, 79.

[21] Dellenbaugh-Losse, M., Zimmermann, N.-E., de Vries, N., 2020. The Urban Commons Cookbook.

[22] Gibson-Graham, J.K., Cameron, J., Healy, S., 2016. Commoning as a postcapitalist politics, in: Releasing the Commons. Routledge.

[23] Ratti, C., Claudel, M., 2016. The City of Tomorrow: Sensors, Networks, Hackers, and the Future of Urban Life, The Future Series. Yale University Press.

[24] Seravalli, A., 2018. Infrastructuring urban commons over time: learnings from two cases, in: Proceedings of the 15th Participatory Design Conference: Full Papers - Volume 1, PDC '18. Association for Computing Machinery, New York, NY, USA, pp. 1–11. https://doi.org/10.1145/3210586.3210593

2.1.2. The increasing role of ICT tools

Digital technologies play an increasingly important role in understanding commons and supporting commoning practices. Since the 1990s, research into so-called 'new' commons has emerged following the growth of the internet and an increasingly networked society. This represents a departure from 'traditional' commons research based on natural resource management and agricultural contexts that served as sites for studies by Hardin and Ostrom. This introduces new digital forms of commons, such as informational, cultural and digital resources, which do not face the same limitations of depletion as traditional commons. They rather introduce new challenges of enclosure and accessibility through design, reach and digital literacy.

A branch of software development embodying the principles of the commons most strongly is open-source software. Open-source software means that those who made the computer software have granted a license for anyone to use or modify it for free, including the 'source code' that underpins how the software works. This contrasts with closed source or proprietary software, where the copyright owner commonly restricts access to paying users and prevents modification or distribution. The move to make software open in this way stems from the growing commercialisation of software in the 1980s and 1990s and the desire to challenge conventional notions of property applied to the internet[25]. While the intentions behind making software open source may differ, they can be considered an expression of the values underpinning commons, as well as important contributions to digital commons themselves[26]. Namely, they represent free and open resources that distributed communities can derive benefits from. Moreover, open-source software enables developers to learn and build upon the efforts of others, and those using the digital tools to monitor their development, participate in maintaining them and ensure accountability through scrutiny and transparency of the source code. In this way, the intention is that users can place greater trust in this software when compared with closed-source software where the source code is not examinable[27]. Like the forms of commons advocated by Ostrom, they also have strict forms of governance in the form of agreed rules, licenses and community moderation practices[28].

ICT scholars have observed that technology design can actively support current and future commoning efforts[29,30,31]. Commoning is inspiring technology designers to think beyond conventional ways of creating for use, support accountability to those who are served by designers, and inject the political values associated with commons in their designs[32]. For instance, Seravalli et al. co-designed municipal services with civil servants and found a commons framing to structure dialogue and decisions with local citizens, which served as benchmark to assess the quality of participation in the project[33]. Heitlinger et al. designed technology around blockchain – a system of recording information that is duplicated and distributed across an entire network of computers[34] - to support the growth of food commons. This work involved participants creating prototypes of 'smart' contracts – 'rules encoded in blockchain-based software that can automatically enforce a contract without human intermediaries' – to govern decentralised autonomous organisations. The research indicated how technology interventions such as blockchain can surface, acknowledge and reward values and relations previously concealed from view, such as the role and consequences of

[25] https://opensource.org/history
[26] Rosnay, M.D. de, Stalder, F., 2020. Digital commons. Internet Policy Review 9.
[27] Rosnay, M.D. de, Stalder, F., 2020. Digital commons. Internet Policy Review 9.
[28] https://opensource.org/osd
[29] Teli et al., 2018
[30] Björgvinsson, E., Ehn, P., Hillgren, P.-A., 2010. Participatory design and "democratizing innovation." Proceedings of the 11th Biennial Participatory Design Conference 41–50. https://doi.org/10.1145/1900441.1900448
[31] Suchman, L., 2002. Located accountabilities in technology production. Scand. J. Inf. Syst. 14, 91–105.
[32] Teli, M., 2015. Computing and the Common. Hints of a new utopia in Participatory Design. Aarhus Series on Human Centered Computing 1, 4–4. https://doi.org/10.7146/aahcc.v1i1.21318
[33] Seravalli, A., Agger Eriksen, M., Hillgren, P.-A., 2017. Co-Design in co-production processes: jointly articulating and appropriating infrastructuring and commoning with civil servants. CoDesign 13, 187–201. https://doi.org/10.1080/15710882.2017.1355004
[34] https://www.euromoney.com/learning/blockchain-explained/what-is-blockchain

our action as humans, and the invisible labours behind food systems. Consequently, this leads to more justice-oriented food commons. However, these projects raise the importance of addressing power imbalances by including a diverse range of stakeholders to avoid accentuating or inducing power imbalances through technology design.

In turn, ICT tools are providing commoners with new tools and approaches to create commons and expand the reach and benefits of their efforts[35]. For example, Decidim is a free open-source tool to support participatory democracy started in Barcelona. Described as a 'public commons infrastructure', this tool 'helps citizens, organisations and public institutions self-organise democratically at every scale' by supporting planning, budgeting, consultations, and deliberation[36]. The tool can be used and amended by anyone, while users can participate in assemblies to make decisions about the future direction of the platform[37]. Participedia is another digital resource documenting and supporting commoning efforts. This platform crowdsources information about public participation projects, along with the methods and organisations responsible[38]. The content on this platform is freely editable by anyone and enables those creating and sustaining commons to draw on a wide range of methods from projects across the world[39].

Designers of ICT platforms are also seeking to play an active role in supporting generative commons. For example, the Open Food Network expresses a political orientation to "*build an open-source commons of software and resources so that producers and communities can build fairer food systems*"[40]. Hence, creators of community food enterprises can leverage the tools and resources offered by the Open Food network to build food hubs, shops, and supply chains. Developers of the Open Food Network argue the digital platform is an integral part of supporting the logistical challenges of creating a community food enterprise[41]. Meanwhile, digital productivity tools like Nextcloud, Mattermost and Cryptpad provide commons-oriented initiatives with alternatives to proprietary platforms. Such tools can be installed on any server to give organisations file hosting and document creation capabilities, as well as facilities for internal communication. These platforms explicitly emphasise their ethical credentials and pitch themselves as more sustainable and trustworthy alternatives to proprietary tools[42]. For example, Cryptpad note "*the development team does not profit from user data in any way... unlike the big platforms that pretend to be "free" while making profits from personal information, we aim to build a sustainable model funded willingly by users*"[43].

In theory, all these tools are accessible by anyone at no cost, and by being open-source tools with the source code and/or wiki content available for modification, anyone can take up the opportunity to participate in the creation or editing of these tools. However, it is important to examine what access means within the context of digital tools. There are overarching questions about who has and does not have access to digital technologies in their entirety – for example, those who lack access to the internet or other digital tools, or lack the requisite digital literacy to reap the benefits of open access to the source code[44]. This resonates with the work of Satchell and Dourish who note the wide

[35] Seravalli, A., Agger Eriksen, M., Hillgren, P.-A., 2017. Co-Design in co-production processes: jointly articulating and appropriating infrastructuring and commoning with civil servants. CoDesign 13, 187–201. https://doi.org/10.1080/15710882.2017.1355004

[36] https://decidim.org

[37] Aragón, P., Kaltenbrunner, A., Calleja-López, A., Pereira, A., Monterde, A., Barandiaran, X.E., Gómez, V., 2017. Deliberative Platform Design: The case study of the online discussions in Decidim Barcelona. arXiv:1707.06526 [cs].

[38] https://participedia.net

[39] Smith, G., Gastil, J., Ryan, M., Richards, R.C., 2020. Testing Assumptions in Deliberative Democratic Design: A Preliminary Assessment of the Efficacy of the Participedia Data Archive as an Analytic Tool. Journal of Deliberative Democracy 13. https://doi.org/10.16997/jdd.277

[40] https://about.openfoodnetwork.org.uk

[41] https://about.openfoodnetwork.org.uk/wp-content/uploads/2021/07/Theory-of-Change-Open-Food-Network-UK.jpg

[42] https://www.techrepublic.com/article/how-open-source-mattermost-is-sneaking-up-on-slacks-messaging-empire/

[43] https://cryptpad.fr

[44] Coles-Kemp, L., Jensen, R.B., 2019. Accessing a New Land: Designing for a Social Conceptualisation of Access, in: Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems. Association for Computing Machinery, New York, NY, USA, pp. 1–12.

variety of cases where people do not engage with technology, through active resistance or an unwillingness to use them[45].

Examining certain digital platforms more closely, there are few critical points to consider. For example, Wikipedia operates as a digital commons and is the most popular encyclopaedia in the world. Wikipedia can be visited by anyone with an internet connection for free and edited anonymously according to community guidelines. However, while access may theoretically be possible for many, there are several geographical and political restrictions on who has access to this resource, such as censorship[46]. Moreover, even where access is granted, there are several inequalities affecting how its users access it, suggested through a bias towards English language Wikipedia to give one example[47]. There are also issues of equality suggesting that users do not have access to a representative set of information. For example, previous analyses suggest less than 10% of Wikipedia's authors may be responsible for more than 90% of the site's content[48], while community moderation and representation in biographical information is likely to be heavily biased against women[49].

In the case of Decidim, while anyone can theoretically participate in the platform, extended support is restricted to citizens of Barcelona, as it is the city of Barcelona that helps fund its development[50]. Moreover, researchers have found challenges relating to newcomers to the platform introducing divergent topics for discussion[51], while many of the rules of engagement may have been set beforehand[52]. In the case of the Open Food Network, Prost et al. noted that while such digital platforms seek to challenge the current system, they may inadvertently be reinforcing social injustices, such as in food distribution, meaning that poorer areas can derive fewer benefits from accessing the platform than those living in richer area[53]. For Prost et al., the platform's design may also be reproducing the very problematic market-driven models the creators set out to challenge and obscuring the social and environmental impact of the digital infrastructure derived from creating an efficient platform[54]. This introduces tensions with the values of commoning food production held by contributors to the Open Food Network.

Seravalli points out the importance of examining how commons are designed, implemented and managed. In understanding commons as a transformative process, commons should not be considered a catch-all solution appropriate for every context[55]. Seravalli highlights the importance of adaptable design strategies that build and draw upon understanding of the practices of commons on the ground. This is particularly important in an urban context which is necessarily dynamic and brings together different and divergent actors[56]. This leads us to think through how we understand access in relation to ICT tools, which we do in the following section.

---

[45] Satchell, C., Dourish, P., 2009. Beyond the user: use and non-use in HCI, in: Proceedings of the 21st Annual Conference of the Australian Computer-Human Interaction Special Interest Group: Design: Open 24/7, OZCHI '09. Association for Computing Machinery, New York, NY, USA, pp. 9–16. https://doi.org/10.1145/1738826.1738829

[46] https://ooni.org/post/2019-china-wikipedia-blocking/

[47] Hara, N., Shachaf, P., Hew, K.F., 2010. Cross-cultural analysis of the Wikipedia community. Journal of the American Society for Information Science and Technology 61, 2097–2108. https://doi.org/10.1002/asi.21373

[48] Ortega, F., Gonzalez-Barahona, J.M., Robles, G., 2008. On the Inequality of Contributions to Wikipedia, in: Proceedings of the 41st Annual Hawaii International Conference on System Sciences (HICSS 2008). Presented at the Proceedings of the 41st Annual Hawaii International Conference on System Sciences (HICSS 2008), pp. 304–304. https://doi.org/10.1109/HICSS.2008.333

[49] Tripodi, F., 2021. Ms. Categorized: Gender, notability, and inequality on Wikipedia. New Media & Society 14614448211023772. https://doi.org/10.1177/14614448211023772

[50] Peña-López, I., 2019. Shifting participation into sovereignty: the case of decidim.barcelona.

[51] Aragon et al., 2017

[52] Peña-López, I., 2019

[53] Prost, S., Crivellaro, C., Haddon, A., Comber, R., 2018. Food Democracy in the Making: Designing with Local Food Networks, in: Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems, CHI '18. Association for Computing Machinery, New York, NY, USA, pp. 1–14. https://doi.org/10.1145/3173574.3173907

[54] Prost et al, 2018

[55] Seravalli, 2018

[56] Seravalli, 2018

2.1.3. Access in relation to ICT tools for generative commons

Research into accessibility of ICT tools often focusses on physical accessibility– for example, how the tools designed enable people with particular needs (for example, visual or auditory impairments) to participate. While this work is highly valuable, it does not get to the heart of how ICT tools could be taken up for generative commons. An important question remains as to how commoners and commons initiatives can take up these digital tools and derive benefits from them for creating and sustaining generative commons.

Our reading of the background work leads us to a broader definition of access that goes beyond traditional approaches to accessibility, insofar as who has the right to access particular ICT tools, towards thinking more around who derives benefits from these tools and in what ways. In other words, being able to use the digital tools or having them available may not be enough to make use of them to support generative commons work, raising questions of what it means to have *access* to a digital tool.

We align with Ribot and Peluso's definition of access as: "*the ability to benefit from things—including material objects, persons, institutions, and symbols*". They argue that "*by focusing on ability, rather than rights as in property theory, this formulation brings attention to a wider range of social relationships that can constrain or enable people to benefit from resources without focusing on property relations alone*"[57]. In terms of access to ICT tools for generative commons, this means thinking beyond participants having the right to access a digital tool, and more towards how they can use these in a commons context to derive benefits for their communities. In this way, Ribot and Peluso invite us to rethink access not just as a "*bundle of rights*" but also as a "*bundle of powers*": what are the social, political and economic contexts shaping people's abilities to benefit? [58]

For Ribot and Peluso, ability speaks directly to power – both in the capacity of actors to affect others, and in the power emerging from people and their relations. It is also necessary to locate these "powers" within the social and political-economic contexts that shape people's abilities to benefit from resources. In other words, it is also a question of ability, capability, diversity and inclusivity[59]. Hence the question is who is seeking access, and what are their capacities and abilities to access the benefits that ICT tools can bring for generative commons?

Coles-Kemp and Jensen reiterate this point in their work to conceptualise access in a social sense. Using Ribot and Peluso's framing, they study mobile phone use by migrants settling in Sweden and reveal a complex web of access that goes beyond traditional framings of accessibility. In particular, they find that "*digital literacy and access to technology are not the only resources and capabilities needed to successfully access digital services and do not guarantee a straightforward resettlement process*"[60]. The authors find that the unsettling and high-pressure context that participants are operating within is the main contributor to deficits in access – rather than, for example, the digital tools themselves. This work draws attention to the importance of access in terms of the benefits derived from a service rather than aspects that control this access. Moreover, it highlights that digital literacy and the right to access technology do not guarantee this access, and are not the only capabilities that should be taken into consideration[61,62].

---

[57] Ribot, J.C., Peluso, N.L., 2003. A Theory of Access*. Rural Sociology 68, 153–181. https://doi.org/10.1111/j.1549-0831.2003.tb00133.x

[58] Ribot and Peluso, 2003

[59] Dellenbaugh-Losse et al, 2020

[60] Coles-Kemp, L., Jensen, R.B., 2019. Accessing a New Land: Designing for a Social Conceptualisation of Access, in: Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems. Association for Computing Machinery, New York, NY, USA, pp. 1–12.

[61] Coles-Kemp and Jensen, 2019.

[62] Coles-Kemp, L., Ashenden, D., Morris, A., Yuille, J., 2020. Digital welfare: designing for more nuanced forms of access. Policy Design and Practice 3, 177–188. https://doi.org/10.1080/25741292.2020.1760414

2.2. Methodology

There are two important aspects from this reading that inform our approach to the deliverable. First, there are specific technical aspects of systems that require closer evaluation. Exploring in depth the context of these digital tools is very important, but the digital tools must themselves be fit for purpose if they are going to be used in the ways intended. Second, there are important socio-technical considerations that must be closely examined. Having digital tools available for communities to use is important, but our review of background work emphasises the need to consider what it means for communities involved in generative commons to take up ICT tools and derive benefits for their commoning efforts. Therefore, we conducted two main strands of work to fulfil deliverable 5.1.

Usability testing

We evaluated the ICT tools that UNEW provided to the gE.CO consortium under deliverable 2.3. This enables us to consider the technical aspects of access and understand if there are interventions that can be made by us as consortium partners, or by others as designers of digital tools, to improve how users can access these tools. The gE.CO toolbox was set up as part of this deliverable to offer a selection of tools for formal groups and informal communities to support the production of generative commons. All the tools selected were open-source digital productivity tools selected to offer a broad range of options to commons initiatives alternatives to support their work. These tools were curated to allow initiatives to explore possible alternatives to proprietary tools and road-test their features and functions for the duration of the project, after which they could consider installing them on their own ICT infrastructure. The toolbox initially included Nextcloud, Mattermost, Rocketchat, Cryptpad and Limesurvey. However, following functionality issues in Rocketchat and Limesurvey, we decided to focus on ensuring Nextcloud, Mattermost and Cryptpad were at optimal functionality. All these tools were installed onto a Newcastle University server and available to use through a web browser, by accessing the website https://gecotoolbox.io. Along with links to the tools, we provided documentation to support their use. By performing a usability analysis on these tools, we aimed to address an important technical aspect of increasing access to ICT tools.

Empirical data collection

We conducted empirical research with communities in our geographical context of the North East of England, to understand the social-technical aspects of access in relation to generative commons. In order to examine access within the context of the commons, it was pivotal to dig deeper into what it means for commons initiatives to have access to ICT tools to support their work. Hence, we were interested to respond to the following questions: what is the role of ICT in enabling groups to manage access and govern their resources, what kinds of benefits do they seek, and what opportunities and limitations do they face? Our reading informed us that it was not just about us 'giving access' to various digital tools, but rather, thinking about the 'bundle of powers' that sat alongside these tools. Additionally, we wanted to investigate how commoners could derive benefits from such tools and how we might configure technologies differently to enable commoners to reap such benefits. Thus, we were prompted to conduct a small research study focused on interviews and a follow-up workshop. The findings from this empirical research can add to the rich insights gathered by other partners.

To offer productive contributions to the project, we analysed the findings from this work and generated a set of recommendations aimed at configuring technologies and research collaborations to support generative commons. We devoted section 3 to setting out the methods and findings from our technical usability testing, while we have devoted section 4 to setting out the empirical methods and findings from our socio-technical community research.

3. Usability testing

Below we explain the methods we used to conduct our usability testing analysis of the gE.CO toolbox, followed by a description of the changes we were able to make based on the findings.

3.1. Methods and approach

It was important that we understood how these tools worked in practice for commons initiatives. This led us to conduct usability testing on the three tools in the gE.CO toolbox that were fully operational at the time of testing: Nextcloud, Mattermost and Cryptpad. These tests would allow us to understand on a fundamental level how usable, and accessible, the various tools in the gE.CO toolbox were for those involved in making generative commons.

Nextcloud is a digital productivity suite that contains four separate tools. For the purposes of testing, we broke these down into their different functionalities: Nextcloud Drive, Nextcloud Talk, Nextcloud Forms and Nextcloud Calendar. Mattermost a communications platform, designed to support internal communications within organisations and initiatives, was tested it as one complete tool. Cryptpad is a digital productivity suite with an explicit focus on security, employing end-to-end encrypted encryption. Although it contains multiple functions, owing to the similarity and standardised interface throughout, we tested it as one complete tool.

By conducting these tests, we could better understand how potential users of the toolkit can derive benefits from these tools. We could also generate recommendations for their ongoing improvement. From the beginning, we knew that some of these recommendations could be addressed through our intervention. These include things relating to documentation, configuration of features and security settings, and things relating to how the tool is managed on our servers. Nonetheless, we were mindful that some of the aspects we would identify through this process would be out of scope. As we were leveraging open-source tools developed by other people, sometimes maintained by communities of hundreds of open-source software developers across the world, there were likely to be issues or software bugs that were coded into these systems that we could not address independently. Moreover, making changes to these tools likely required substantial rewrites to unfamiliar software and buy-in from members of these open-source communities, both of which were beyond the scope of our work. In these instances, we documented these issues or limitations of the system and suggested how these could be addressed by open-source communities at large. We attempted to signpost where our recommendations were in scope for us to address or not.

Before conducting usability testing, we reflected on Jacob Nielsen's widely-used '10 Usability Heuristics'[63]. Originally written in 1994 and still updated today, these are ten principles for the design of interactions with software that could be considered when thinking about how usable a system is (see appendix 6.1). To inform our usability testing procedures, we drew from Carol Barnum's 'Usability Testing Essentials'[64]. This was helpful for adopting a user-centred perspective to reflecting on the toolkit, looking beyond the tools themselves to think about people would use them. It also supported us to structure our usability testing with four important elements in mind[65]:

- Defining user profiles, so we could imagine who would be using the toolkit;
- Creating task-based scenarios to ensure that we were testing the system under realistic conditions for commons initiatives;
- Using a think-aloud process that involves writing up our thoughts and initial reactions to the tools;
- Conducting repeated and iterative testing and not relying on our first observations.

This led us to design a usability testing procedure centred on four main questions. These questions would ensure that the usability testing would be a valuable exercise and could generate actionable recommendations for us and for the wider open-source community. These were:

1. What are our first impressions of the tool?

[63] https://www.nngroup.com/articles/ten-usability-heuristics/
[64] Barnum, C.M., 2011. Usability Testing Essentials. Morgan Kaufmann, Burlington, MA.
[65] Barnum, C.M., 2011

2. What is the user journey of the tool? Or, in other words, what path does the user take through the system to achieve their aims?
3. What do we like about the system?
4. What do we think could be improved about the system?

The usability tests were conducted by Sean Peacock at Newcastle University. Sean conducted these from the perspective of two personas, Alicia and Bettina, whom were modelled on potential users of the gE.CO toolbox. A method suggested by Barnum, personas are fictional characters created by designers to help them imagine the kinds of users that would be using their software and adopt a more user-centred approach to design[66]. Personas are a helpful tool for 'stepping out of yourself' and thinking through the different needs, behaviours and experiences of different users that may use your software[67].

The two personas were used interchangeably to help think through two different perspectives towards users of the open-source tools in the gE.CO toolbox. Alicia is new to commons initiatives and her experience lay in using technology for her job, while Bettina comes in with several different expectations as an experienced commoner familiar with proprietary digital tools. While these two personas do not represent the breadth of possible users of the toolbox, they allow for contrasting between different perspectives and support navigating through these tools in a user-centred way.

The two personas adopted in this usability testing were as follows:

Persona A (Alicia): *I am an active member of my community and I'm looking to set up a new commons' organisation. I know some people who are interested and we need tools that are going to help us get set up. I'm relatively new to using digital tools outside of my job, but use a smartphone. I'm hoping to find some tools that are easy and simple to use and don't require training. I don't really know what tools I need or how to use them, but I'm hoping the toolbox will be able to provide me with some ideas.*

Persona B (Bettina): *I am a member of an established community group looking to use digital tools to help my organisation do its work. We already use some digital tools, such as Google Drive, Dropbox and WhatsApp, as well all work remotely. I'm looking for some free and open-source alternatives that will allow us to do our work easily and aligns with our political views.*

Following the 'think aloud method', our usability testing findings are written in the first-person perspective, as if we are speaking from the perspective of our personas. These are supported by screenshots of the software taken during our usability testing. Following these findings, we offer recommendations in the form of a table.

3.2. Usability study findings

Through conducting usability testing on the versions of Nextcloud, Mattermost and Cryptpad deployed as part of the gE.CO toolbox, we have generated recommendations for improving the respective tools. You can find in Appendix 6.2 a table detailing issues identified through the usability testing and recommendations for their resolution. The table of findings covers the following: issue; the functionality this issue affects; the recommendations for improvement of this issue; the resolutions taken to address this issue; and the priority that should be given to this issue. The tests were conducted between March and April 2021. The analysis was conducted by Sean Peacock and supported by Rob Anderson, Vasilis Vlachokyriakos and Clara Crivellaro (all UNEW).

3.3. Changes implemented following usability testing

[66] Barnum, C.M., 2011
[67] https://www.interaction-design.org/literature/article/personas-why-and-how-you-should-use-them

We have been able to address many of the issues highlighted through the usability testing. A summary of these changes are as follows:

- We tweaked the privacy settings in Nextcloud and Mattermost so that the list of users of the gE.CO toolbox server no longer shows up for everyone;
- We conducted further testing to review how different features work, and managed to identify workarounds to several of the issues identified;
- We introduced Collabora, an add-on for Nextcloud that supports the creation of rich text documents, to address the in-built limitation limitations in document creation;
- We reviewed a storage space issue identified by members of the gE.CO consortium and clarified that storage allocation for users is scalable based on need;
- We identified omissions in documentation and attempted to address these through additions and revisions for clarity.

As the gE.CO toolbox involves appropriating existing open-source tools that others have designed, there are other recommendations that are not in scope for us. These consist of suggestions to improve the user interface and experience that would likely require substantial changes to the code base of the software. Such changes would require buy-in from the wider open-source community and developer capacity that stretches beyond the scope of the gE.CO project.

We further summarise our recommendations for the open-source community in section 5.1.

4. Empirical data collection

In this section, we detail the design and findings of our empirical research with community groups in the North East of England.

4.1. Qualitative research methods

To investigate how best to increase accessibility of ICT tools for commons groups, we conducted empirical research to explore the existing practices, outputs and digital technology use of organisations supporting the creation of commons, and understand how technologies could be designed to sustain and enable generative commons. This was conducted in the context of North East England and adds to the rich insights gathered by other partners.

We wanted to ask two main questions in this research. Firstly, what are some of the practices and outputs of organisations supporting the creation of commons, and how are they currently using digital technologies in their work? Secondly, how can digital technologies be designed to sustain existing commoning practices and support the generative production of commons?

We adopted a qualitative research approach, which allows for exploring socio-technical topics in suitable breadth and depth. Within this approach, we used two main research methods: one-on-one, semi-structured interviews, and creative workshops. Interviews are suited for in-depth discussion with individuals and organisations, and a semi-structured approach alongside an interview guide provides scope for free-flowing conversation and exploration of topics in collaboration with the participant[68]. Meanwhile, creative workshops are a valuable method used by technology designers.
We recruited 15 representatives (Appendix 6.4) from 14 community organisations to this research. We did this through making direct email and telephone contact with a wide range of organisations across the region.

[68] Braun, V., Clarke, V., 2013. Successful qualitative research: a practical guide for beginners. SAGE, Los Angeles.

Our search criteria were that they belonged to a community organisation, operating in the public or third sector and based in North East England, who were responsible for creating, sharing and sustaining collective resources in their community. Through our search, we reached out to tens of organisations doing vital work. This included community centres, gardens, artist studios, action groups, property developers, co-housing schemes, mental health support organisations and events spaces.

We cast the net wide as to capture the breadth of community work taking place across the region during the COVID-19 pandemic. We were also keen to ensure we did not overlook important work that would not conventionally be considered urban commons or explicitly defined as such by the groups themselves. We took a broad interpretation of commons and commoning, including if an organisation was providing a community facility, delivering services with those most in need, or taking political action in their community, among other examples.

We obtained full ethical approval from Newcastle University to conduct this research, and participants gave their informed consent to take part in the interviews and the workshop respectively.

4.1.1 Interviews

We conducted interviews with 15 representatives from 14 different groups across North East England. These interviews aimed at finding out more about the day-to-day work, motivations, and digital technology use of different groups. These took place through Zoom or telephone call between April and June 2021 and lasted around one hour each.

Interview questions were related to projects, governance, impact, opportunities, challenges, and perceptions of technology. The interviews were conversational in their nature, but some pre-prepared questions helped in guiding the discussion. Some of the questions included:

- How did you become involved in your organisation?
- What impact does your work have on the community?
- Is anything you wish you could do more of in your organisation?
- How has COVID-19 impacted the ways that you do your work?
- What are your experiences with using digital technologies in your organisation?

The interviews were recorded using Zoom. A machine-generated transcript was produced from each conversation, which was then cleaned up for analysis. We analysed the interviews to try and spot patterns and themes between them, drawing on powerful quotes and making inferences from the discussions.

This analysis led us to identify four common topics of discussion across the interviews. These were:

- Governance: roles, responsibilities and stewardship
- Material resources and assets
- Enacting values of equity, participation and co-creation
- Sharing benefits and realising impact

We were keen on investigating these further, so we designed a follow-up workshop with activities that were based on these four topics. We wanted to build on the experiences and perceptions shared by participants to think critically about the role that technology and design can play in overcoming the challenges they shared. We invited all participants from the interviews to this workshop.

4.1.2. Workshop

In July 2021, we carried out a follow-up workshop with five representatives from community organisations (Appendix 6.5). This aimed at reflecting on the opportunities and challenges that groups face in supporting their communities.

The 90-minute workshop took place over Zoom, and we also used an online whiteboard tool called Miro(https://miro.com) which supported discussions between participants. It also allowed two additional participants who could not make it to the workshop reflect on and contribute to the discussions.

The workshop involved three activities including:

- Using sticky notes to respond to open questions about their work – e.g., 'what digital technologies help you create, maintain and share your community resource?'
- Running a discussion centred on five different prompts, drawing on quotes from interviews – e.g., 'what trade-offs do you make when choosing and using technology for your work?'
- Prioritising three of these challenges or opportunities to take forward in their community domains.

The five prompts to encourage discussion were:

- Appropriation and workarounds - what are the things you have to do to make tech work for you?
- Trade-offs in technology - what trade-offs do you make when choosing and using technology for your work?
- Technology support - what would new technologies enable you to do that existing ones don't? What networks of support do we need to make that possible?
- Adapting to pandemic - what challenges and opportunities has the pandemic posed in your ongoing work of creating, sharing and maintaining community resources?
- Accessing resources - what tensions and challenges do you face in widening access to your community resources? What strategies do you employ to open participation and access, while protecting the community resources?

We analysed data from both the workshop and the interviews. We read through quotes and highlighted important points and common threads between participants. This allowed us to build up a picture of what was most significant about the discussions and to generate themes across the interview and workshop data. We present these themes later in the report.

Analysing this data has also made it possible to draw out implications and recommendations. These recommendations are presented in Section 5 of the report and are intended to support groups doing valuable work in their communities, as well as researchers looking to better understand this work, and designers of digital technologies who are looking for ways to facilitate community action.

Below, we provide screenshots from two whiteboards on the Miro tool (Figure 1). The upper one shows our planning to create the workshop, while the lower one shows the whiteboard from the workshop itself.

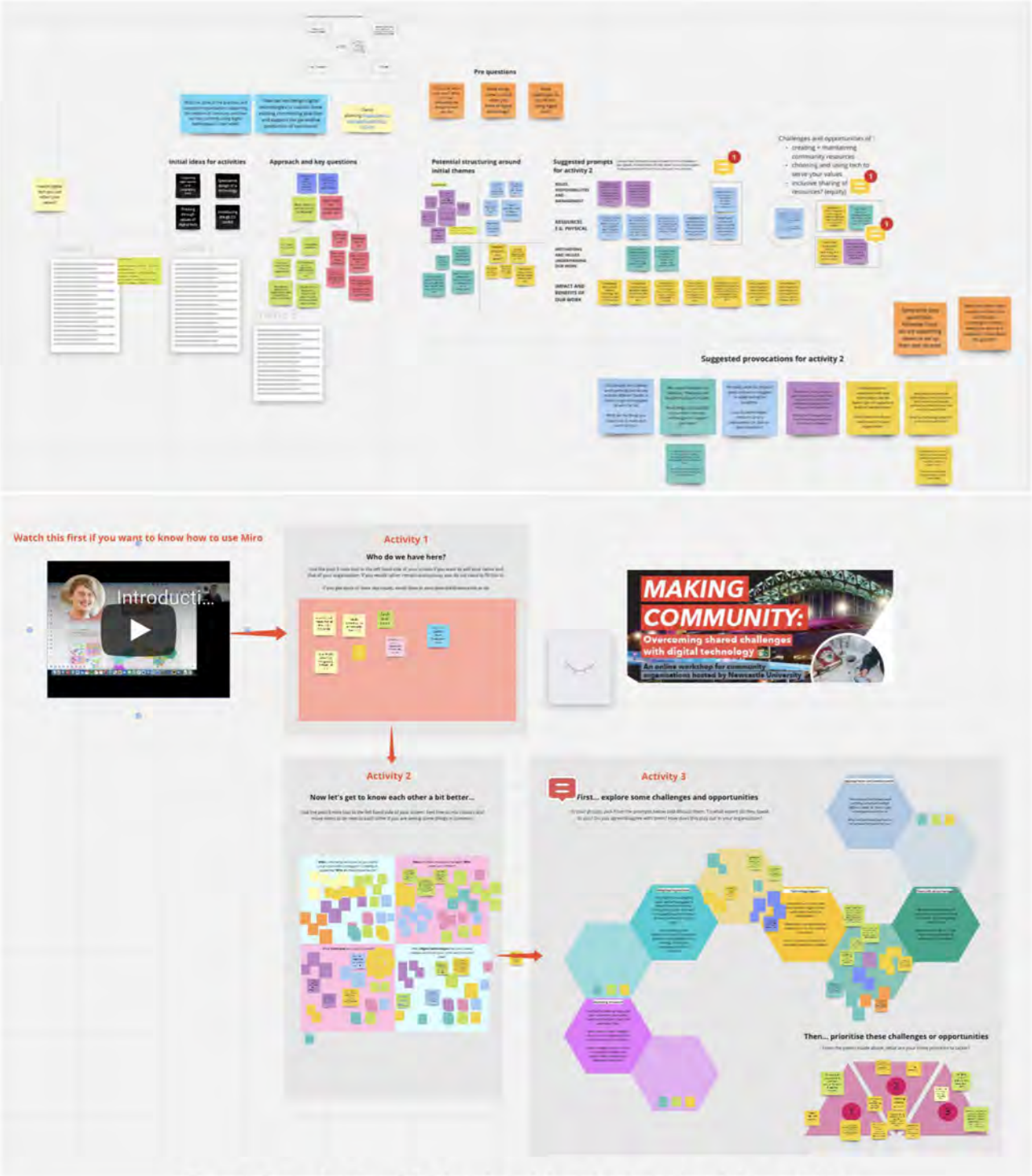


Figure 1. Screenshots from Miro board: workshop planning and workshops activities

4.1.3. Thematic analysis of interviews and workshop

To analyse our empirical data, we used Braun and Clarke's thematic analysis method[69]. This is a widely used method across qualitative research areas and supports researchers to find links between different sets of data. Here, themes

[69] Braun, V., Clarke, V., 2021. Thematic Analysis: A Practical Guide. SAGE Publications Ltd, London.

become ways of illuminating links between different data points, drawing together analytical threads, and suggesting possible implications from the data.

We did two rounds of collaborative thematic analysis. The first round allowed us to generate candidate themes that we could use to design the workshop. The second round of thematic analysis went into greater depth across the interviews and the workshop. We achieved this by selectively reviewing across all the transcripts to identify important data and assign this a code. A code is a way of describing or categorising data. We then collated all these codes into a table and compared between them to work up sub-themes and finally overarching themes that represented the data. An extract from this table is shown below. This analysis led us to three overarching themes.

We used Miro to undertake the second round of data analysis, the same tool that we used to deliver the workshop activities. A screenshot of this Miro whiteboard (Figure 2) and the table (Table 1) are shown below.

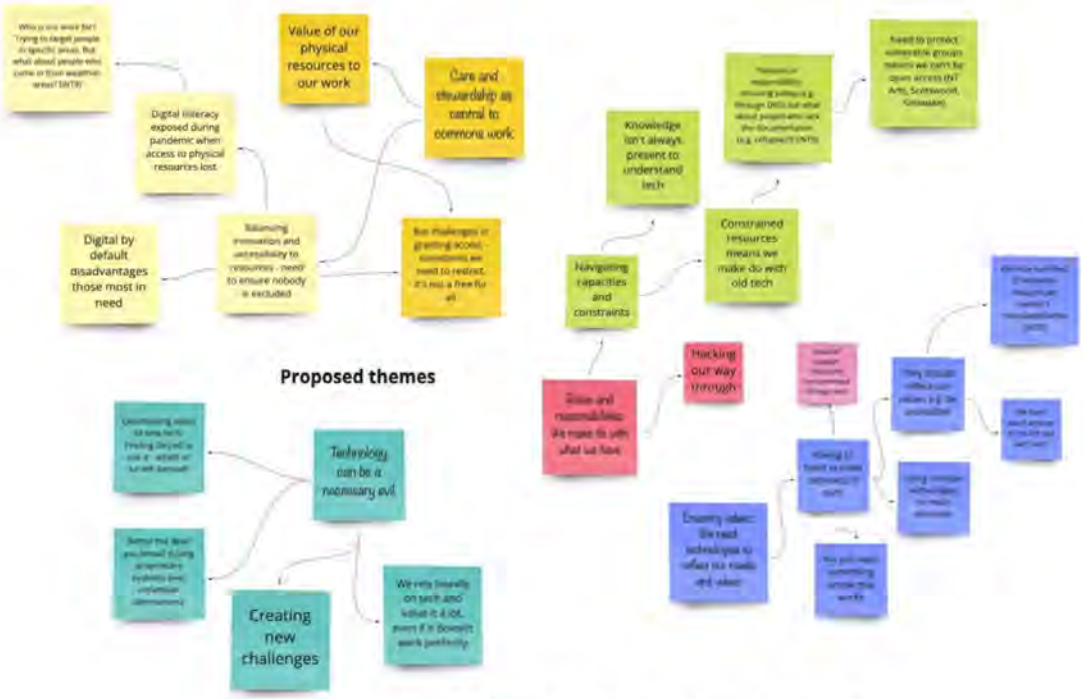


Figure 2. Miro board for second round of analysis

Themes

Candidate theme	Candidate sub theme	Code	Quote	Interviewee/transcript
		Rethinking our offering as a community resource	So we often think about projects as being resource based, but the studio – because it's what we do – I've never really thought of it as a community resource in itself	INT11/WS1
		Importance of non-physical resources for our work	And so it's just kind of thinking of the resources, perhaps that we have within our much smaller developing community to help each other build that, perhaps and how we kind of learn from each other to do so	INT4/WS1
		Value is more than the sum of its parts	Similar sort of thing with the garden, you've got a very tangible place people can go and engage with, which in many ways is an end in itself, that the work in the garden creates the space, but it's far more than that. You get people who use the garden, for all sorts of other reasons, through mental health, community engagement staff, work with refugees locally.	INT9/WS1
		Value of the intangible outputs of community work	We've a lot of volunteers who work in the garden who are doing that because they have issues of mental health – and the garden is a great help in improving their mental health, allowing them to, in some cases, return to the workforce, or other things that they weren't able to do previously because of the mental health problems. So yeah, the outputs are quite intangible in some respects, so it's not just the fruit and veg of a two and a half acre plot in the West End of Newcastle	INT9/WS1
		Support networks between organisations as a valuable resource	So, we've made connections and found other facilitators or volunteers or new participants through the Solar and Shadow. So, so that in itself, kind of serves as a community resource in some ways.	INT11/WS1
		Helping people help themselves	So, there is an element of our work, which we are developing, which is about passing more responsibility for managing the studio over to these people – so that, in some ways, we are there to manage access and support for some of the studio... if they can be supported to take care of themselves, is something almost separate and, in fact, then becomes something that increases rather than diminishes our capacity for support	INT11/WS1
	Capacities and constraints	Some dependent on the resources they provide Overextending ourselves as an organisation	As they mature, essentially, as they learn more and they do more, we want to encourage independence, because at the moment we have a dependency issue. But that does become a real question of what our actual support is and what the benefit is... It was it was a bit of a wake up call to hear some of them say, 'Oh, well I think they're going to carry me out of here in a box'... you know, we talked about how much good we're doing, but that in itself is a problem	INT11/WS1
		Importance of building community capacity through their initiative Community org as a platform to facilitate action	So, the idea is to push people – or guide people, encourage them – through increasing independence, they will naturally we hope to reach a point where they're no longer interested in coming to a beginner's drawing class, but they may be interested in taking a seat on our board or forming kind of a structure that eventually builds its own resources that it needs to deliver its project... and then, as a result, our place as an organisation is to facilitate them acquiring the resources they need in order to deliver that	INT11/WS1

Table 1.Extract of data analysis

4.2. Research findings

Following the principles of thematic analysis outlined by Braun and Clarke[70], we surfaced the negotiations, realities and complexities of producing community resources in a communal and through a commoning approach.

From our analysis, we found three main themes. Firstly, that stewardship and care are central to the work of community initiatives. Second, that making things work with what they have is integral to their practice. Third, these participants are not currently well-served by ICT tools and that they need technologies that better reflect their values as community initiatives.

4.2.1. Stewardship and care are central to our work

Participants discussed the need to protect and care for the limited resources they had at their disposal. Stewardship and care of their material resources – most commonly a physical space – were key to their work. This importance was magnified by COVID-19 lockdowns restricting access to these spaces. The consequences could be felt by everyone, from members of their community to the organisations they collaborate with.

Material resources

Many of the groups had material resources to 'look after' as part of their work: whether it was a community centre, events space, offices, studios, or a communal garden. Managing access to these resources was key to their work. For example, INT1, who helps to run a community development organisation, highlights their base on a main road in the town centre as a key part of their offering: '*we provide a space where people can feel comfortable and welcome… it is a place and a space to be'* (INT1). Similarly, INT15 has helped set up a DIY cinema and events space, but the intention was for it to serve a much broader purpose, as *'a social centre, like a kind of info point for activism [and] a resource centre for like all sorts of materials and facilities'* and, after austerity and social pressures brought about by the 2007-2008 financial crisis, *'a space to find a bit of freedom […] and solace and community and self-*

[70] Braun and Clarke, 2021

confidence'. Most of these organisations were caring for disused or neglected buildings by bringing them back into use, including former offices (INT1, INT14), shops (INT13), schools (INT9, INT11), warehouses (INT15) and other civic buildings (INT6, INT7); INT12 single out their role in renovating a neglected, burned-out bowling pavilion into a café, garden and community space as a key achievement in their stewardship of their community.

The value of these material resources to the community was clear: they were a lifeline for many individuals in communities, particularly those who were most disadvantaged. This was clear to INT11, who runs a community support centre: *'a lot of people just, kind of, come along to be in the centre, as a kind of social thing, or as a, you know, as an inclusion thing... they might not really have a reason to be there, they just want to sit in the café or in the IT suite because they know such and such will be in there, you know?'* (INT10). Similarly, INT9, who chairs the board looking after a community garden, emphasised the health and social benefits of caring for a natural space *'in one of the most deprived communities in England'*. These spaces are more than sites for the transaction of services as they offer real value to communities. The value of this stewardship extends to support other local organisations too. For example, INT1 helps managing a space that serves as a base for local artists, language teachers, community leaders and small businesses, while INT14's hosts organisations that share their charitable and socially focused-aims.

Navigating tensions

Our research uncovered tension in these organisations' approaches to access: how can we enable access to these resources for the whole community while protecting them from degradation and harm? Most participants noted that access was restricted in some way. For example, a representative from a community garden noted, *"you can't just wander off the street and walk around"*, but instead they host open days throughout the year (INT9). Similarly, a lending library worked on an appointments system and would not accept drop ins (INT13). Organisations offering mental health support operated on a referral system, requiring the person is referred by a medical professional before being able to access the spaces.

There were clear rationales behind these decisions, the most common being that their desires to be open access came into tension with their moral and legal responsibilities to protect vulnerable groups accessing these spaces. For the community garden, they explained that they host groups for local young people and for those with dementia and noted *'there was a real safeguarding concerned about these mixed groups within the garden [at the same time]'* (INT9). Similarly, for the library, they noted *'we've always done appointments, the main reason being if I've got women visiting from the local refuge, I don't want them walking into an ex-abuser who's come in from another organisation'* (INT13). This indicates reflexivity about the limitations of what they can provide to their community while also ensuring they take care of those at risk of harm.

It seems that while open access might be the ideal aim for commons organisations, enacting this presents significant challenges for stewardship and care. One representative from a co-housing initiative summed up this tension that they are negotiating around a common house that will be provided for the benefit of the wider community around their co-housing scheme: *'it's trust based, it's not a free for all, it's not like a Wild West and... so yes, that the common house is common to the community, but it's also very much, a kind of education space, you know?... But in order for this to be maintained as a common house, there's got to be there's got to be a kind of fairly tightly, collectively governed sort of stewardship. So, it's not, we don't want the tragedy of the commons, we don't want this coming in and destroying it'* (INT5). Making explicit references to Hardin's Tragedy of the Commons, this quote underlines how providing access and ensuring its sustainability as a community asset implies taking care of it and ensuring that a resource is not undermined or degraded.

The impact of COVID-19

The COVID-19 pandemic has incurred lockdowns, mandatory social distancing and reduced capacities of physical spaces, which meant that all of the organisations we spoke to had to discontinue their face-to-face activities since March 2020. At the time of speaking to them, lockdowns were beginning to ease, and face-to-face activities were

slowly resuming. During the lockdowns, most organisations spoke of feeling responsible to their communities and continue their activities in some way, especially to those most in need. Some examples included creating support packages and meals for the homeless (INT1), creating new communities of support (INT7, INT11), organising guided walks (INT3), gardening sessions (INT10) and tackling loneliness among older people (INT2, INT6).

All of the organisations spoke about their reliance on digital technology to ensure continuity of this support, to varying degrees. While some struggled to shift physical events to online events, others discussed how a national lockdown in March 2020 forced organisations to start using platforms like Zoom and Microsoft Teams by default almost overnight. Internal work shifted online, such as conducing meetings online. Outward-facing work shifted too, changing how members of the community access services and events and redefining what it means to care – once through physical presence and support, now at distance. One organisation remarked how they chose their platform carefully to minimise barriers to access: *'rather than get into Zoom or anything like that [...] we do it through Facebook [Live], because we already had 100 people on Facebook. It was publicly accessible. There were less barriers, no one had to sign up for anything new, no one had to get an access code or download a bit of software that is easy to use. Zoom, it's not something people were familiar with; that hundred odd people who are on Facebook, they knew how to make how to make Facebook work, it was already on their phones on their tablets on their computers, it was part of their life'* (INT11). For this organisation, adopting Facebook was a conscious effort to continue their responsibilities to their members in a way that met them closer to where they are at compared with an unfamiliar platform.

Digital exclusion

For several participants, the COVID-19 pandemic has magnified shortcomings in digital literacy among their communities, playing out as a lack of access, knowledge or desire to use technology and raising serious questions around accessibility. INT14 mentioned how one quarter of their members did not have an email address, and they recalled occasions where members joined Zoom sessions from a bus station because they relied on accessing the free Wi-Fi there. For INT10, shifting to digital means during the pandemic was *'doubly difficult'* for people already socially and/or economically excluded, compounding their exclusion further and presenting implications for those supporting such communities. INT1 speculated that this exclusion, and a lack of engagement with digitalised services in society, may have also contributed to an active distrust of technologies in general: '*We've got lots of people who are isolated who don't have access to digital stuff or don't want access to digital stuff... I was talking to a guy the other day who doesn't even have a bank account, he never does anything that, you know, everything is hand, face to face, hand by hand, and they don't want to, do they? There is lot of distrust of technology.'*

How might organisations give care to those who lack trust in the digital channels through which it is delivered? This suggests a need to actively explore issues of trust, particularly among those that experience the most disadvantage. INT3 shared how they were actively seeking to do this through trainings: '*it was a small pilot project which we want to grow, because we understand that there's a lot of people who are, yeah, sort of separated from this digital space, because they don't understand it, and they can't access it'* (INT3). This active challenge of digital exclusion prompted these organisations to overcome new barriers created from digital technology to facilitate sustained access to their resources.

4.2.2. Making things work with what we have

There were in-depth discussions about two main constraints: finances and time. Participants reported on the significant anxieties caused by relying on unreliable cycles of funding. Meanwhile, a lack of time, capacity and a fear of overstretching staff and volunteers have hampered their ability to find support and get the right tools in place to deliver on their community visions. These constraints were described as 'trade-offs' they made in their selection and usage of digital technology, highlighting a lack of technological capacity, limited 'breathing room' to explore the possibilities for technology, and a need to use whatever technology they could make work, relying on dated hardware and free and convenient proprietary software to do what they needed to do.

Managing financial and time-based constraints

In terms of financial constraints, for example, INT10 spoke of the 'cycles' of funding that have historically affected their capacity to do with in the community. Meanwhile, INT3 noted that funding is what is holding them and another partner organisation back from realising plans for a physical transformation of their community. Their plans for a new community building and garden have been shelved because of their partners losing their core funding and facing an uncertain future. They underline the difficulty of obtaining funding as a voluntary organisation and the trap of *'constantly just doing funding applications'* to stay operational (INT3). Another constraint was time: as voluntary organisations, many of the people carrying out this work are unpaid and have to find time to do it around employment and other responsibilities.

Several participants indicated that they worked in a constant state of precarity and uncertainty, chasing limited funding and facing limited time to carry out their work. This was particularly alarming when it came to their physical spaces. The operating costs of offices may be prohibitively expensive for some voluntary organisations, leading them to occupy 'meanwhile' spaces. This was the case for INT13's organisation, a multilingual library open to all but targeted at refugees and asylum seekers, who previously occupied an empty shop unit in the city centre until they were given notice to leave during the pandemic (*"after five and a half years... they gave us two weeks' notice and I just laughed"*). They now lacked a city centre space for doing their work, which has significantly constrained their ability to provide support and forcing people to travel several miles out of the city to their storage facility.

INT14 had a similar experience of being forced to vacate an underutilised office block which they had rented as a meanwhile space along with other charities – *"good groups, grassroots type stuff"* – and spoke of the fears of a repeat situation in their new premises. Calling on the city council to ensure "*there is space for community work and activity in the city centre"*, INT14 raised questions of *"what are city centres for?"* and *"who do they belong to?"* relaying as such the everyday anxieties and constraints faced by voluntary organisations. INT14 also hinted at the trade-offs they are having to make because of their reliance on meanwhile spaces: *"something that sticks in the craw is [...] we're getting this space, you know, cheap, because it was a tax break for billionaires"*, while in their current space, they are thankful for "*not dealing with multinationals and offshore shenanigans"*. For INT14, being forced to find cheap space that is only available because of tax breaks "*sticks in the craw"*, which suggests it may well represent a necessary compromise in their political or ethical position to keep their work going.

Relationship with digital technologies

These financial and time constraints were impacting their use of digital technologies. For example, financial constraints have been leading organisations to use technologies that were outdated or not suitable for their needs. INT11 shared how their blended in-person and remote workshops required several digital tools but a lack of funds had led them to compromise on quality: "*what we really needed was proper video conferencing setups [... but] we had a projector where you couldn't really see if it was too bright, and the microphones were echoey. So, people who were attending in person struggled to interact with the people who are online and people who are online struggled to actually see what was happening in the room"* (INT11/WS1). Similarly, INT1 relied on several Chromebooks, which were described as *"are rubbish for anything else but reading things or accessing Zoom"*. Being forced to compromise with technologies that are unsuitable for their needs underlines issues of digital access in a constrained context.

INT4 openly admitted that their use of tech consisted of *"fumbling along and hoping for the best"* as finding the right tools was time-consuming. Here, the implication is that the aim is solely to make things work without the capacity to reflect on the best ways forward. This mirrors discussions they have had with other co-housing organisations, who are "*just kind of making it up as they go along"* and using *"various Excel spreadsheets that are different versions of the same thing"* (INT4). Time is the biggest limiting factor for INT4, who speaks of the challenges they have faced in trying to get a new system up and running for their co-housing organisation: "*we*

haven't necessarily got the time to do something on such a bespoke level and so what kind of off-the-shelf package can we access at an affordable rate?". This suggests that even though INT4 thinks a bespoke system to manage their CRM would be ideal, they are having to compromise with an *'affordable'*, *'off-the-shelf'* alternative. To ameliorate these constraints, several participants have sought to use such off-the-shelf technologies already at their disposal, such as Google Drive and Microsoft Teams.

Participants also referred to their limitations around knowledge and skills about technology and being able to communicate this to others. INT11, representing a community support organisation, noted how they were at a loss when the pandemic forced them to translate their physical support into digital support: *"What we realised very quickly was how kind of centre-based we are, as a service, because people come to us, you know, we didn't deliver to it to them. They come to us to use the garden space, to use the café, to use the kids club, to come and sit at a computer and get employment support. And it was all people coming to the centre. Of course, when we couldn't come to the centre, it's kind of like, you know, how do we support them?"* (INT10). Other organisations had to face the fact that they lacked the capacity to address the digital skills gap among some of their members: *"It's been that terrible thing of just having to say - not that we're going to cut them adrift, but – 'Actually, yeah, you don't have any digital skills, I'm sorry. If you can get digital skills, you can reach what we do, but we don't have the resources to give you those digital skills to help you access what we do" (INT11).* The admission that they were not be able to help everyone indicated reflexivity among organisations thinking through how to practically address barriers to accessing their services. It also reflected a resignation towards what is and what is not possible with the limited resources they possess, albeit with a hesitation to *'cut [people] adrift'*.

Navigating and overcoming constraints

Others involved in the research shared their view that the adoption of digital technologies following COVID-19 presented opportunities to address these constraints. For example, the two organisations based in rural areas valued the introduction of Zoom as an alternative to physical meetings. For INT2, it helped build stronger relationships with organisations from across the region where travel would be uneconomical or undesirable. For INT6, it enabled them to access seminars at the university relevant to their work while saving a two-hour round trip to Newcastle city centre. For others like INT11, who helped run an arts studio for those struggling with their mental health, digital technologies enabled them to support new people to access their work and build new partnerships with artists. It also allowed them to build entirely new resources in the form of recorded videos: *"we are now able to say to people [...] If you're interested in seeing what it's all about, if you if you want to know, go to our Facebook page, there's 40 odd hours of art for mental health sessions there... you know, I don't know how engaging they are to be honest, after the fact, but they are there [...] that's digital technology that we wouldn't have previously made use of"* (INT11). While they noted the potential for the interaction to be of poorer quality, they emphasised that these are new and unexpected resources they can add to their offering and use to offset the constraints they face elsewhere in their work.

The processes surrounding getting grant funding as a voluntary organisation can be constraining in being short-term, based on requirements pre-set by those providing the funding, and - in the words of INT6 - a drain on resources often *"without a productive outcome, even though it's supposed to be checking that the outcome is productive"* (INT6/WS1). For INT11, a significant constraint was in how funding is focused on delivery of outcomes rather than exploring potential – what they refer to as 'R&D' (research and development). INT11 sums up this challenge: *"Funders expect us to turn up and say, this is what we're gonna do, this is how we're going to do it, this is what your outcomes are going to be. So, to say, what is the potential of technology? We have no idea. We can't fund that. So, yeah, we need some mechanism by which we can have a little bit of breathing room to explore potential"*. For INT11, the introduction of new technologies to support their new practices – a blending of physical and virtual workshops – would be welcome, but there is a feeling that *"there is no way we are ever going to find a funder who's going to say: you know what, you can buy £2000 worth of equipment to run workshops for six months and see what happens"*.

The desire for *'breathing room'* is important here, as it suggests a lack of space to be able to think differently and understand how technologies could potentially support these organisations' practices. If this exploration cannot

happen within voluntary organisations, then where will it happen? Moreover, as INT11 conceded in discussing the failings of using technologies for blended workshops, the realities of technology deployment may not match up to the promises '*on paper*', which would have *"'allowed us to reach a lot more people and give a lot more support"*, but in reality, fell short (INT11/WS1). This reinforces the value of providing space to critique and experiment with technologies in their context to ensure that they work for the organisations in question. INT6 suggested that like any attempts to *"do things differently"*, testing new technologies comes with risks, and to *"expect quite a lot of your risks won't pay off, but some will"* (INT6/WS1). Perceiving technology exploration as inherently different and risky hints at possible barriers to seeing new technologies as in reach for organisations unable to take risks. It also raises questions about who, if not these organisations, should bear these risks, and how new technologies can be explored within organisations without the baggage of it being perceived as risky.

The need to build capacity around using and evaluating digital technologies also came out strongly. INT6 expressed this as a need for 'platforms of support' to help build this capacity. They suggested a starting point could be physical and personal forms of support – referencing a local community voluntary action (CVA) group – that many are accustomed to: "*so people get to know [...someone] by name and say, they're very helpful. X in place Y is very helpful, go and ask"* (INT6/WS1). For INT11, informed knowledge about technologies would help organisations to navigate technological requirements and critique received wisdom about the technologies they could be adopting as part of their work. The value of building the capacity to critique would also enable INT11's organisation to respond directly to their organisational constraints: '*how do we find out what support we can have so that we're not wasting our time creating, you know, dancing videos [on TikTok] or something that just aren't going anywhere'* (INT11).

INT4 suggested that such a platform of support could build on the spirit of the digital commons: *"I guess it would be that kind of digital commons thing of, you know, that we're all kind of working it out at the same time, and that there are various people that we could get in touch with to be like 'Oh, you know, like, how does this functionality work?' Or, you know, 'Do you understand this?"* (INT4). This suggests an opportunity for consortiums in the spirit of gE.CO to be involved in interpreting such tools – investigating questions such as what the value of these tools is to their work – and drawing on commoning approaches to shape such communities of support around technology use in voluntary organisations.

4.2.3. We need technologies that better reflect our values

The third theme relates to the values and ethics of the digital technologies that participating organisations use day-to-day in their commoning work. Participants expressed concerns about the controlling nature of proprietary technologies, along with fears about adopting new and unfamiliar alternatives (e.g. open source). This suggests possible implications for the perceived accessibility of digital tools for commoning – for example, those provided through the gE.CO toolbox – warranting further attention. Participants expressed a collective desire to see technologies designed differently to better reflect the values that are core to their practices and products as organisations operating in community, voluntary, charitable and socially just ways.

Articulating values

What came through strongly in discussions were clear articulations of their values as organisations. These values and political orientations not only guided their work, but in the case of some, their selection of digital technologies to support this work. For example, INT15 articulated their values as *'anti-oppression'* and have developed an online knowledge base around a wiki and an open-source scheduling tool for volunteers. The rationale for this was in wanting to *"make sure things were extremely transparent and that everyone had a chance to decide [...and] limit individual power and maximise participation and collective ownership" (INT15)*. Aside from fitting with their values and aspirations, for INT15, the wiki and scheduling tool were *"just really convenient, because it met that need that desire and need for transparency and accessibility and centralising information"* (INT15). Here, something that meets their values if also judged to be convenient – in contrast to how others may conventionally define convenience as ease of use, ubiquity or accessibility.

Meanwhile, INT4 discussed how important it was to carefully consider the technologies they would adopt and hesitated to utilise new technologies that may exclude people, as it would be at odds with the values of their work: *"it's, kind of, finding what software that is powerful enough but also user friendly enough that people that don't perhaps use... that haven't, yeah, that aren't perhaps as technologically literate as other members are, to keep up with it"* (INT4). The implication is that a trade-off must be made between technological features (power) and accessibility (being user friendly), and organisations like that supported by INT4 must strike a balance between finding something *'powerful enough'* and '*user friendly enough'*. INT4 hints at a perception that technologies can often go against these values of supporting intergenerational participation, leading to *'difficulties or resistance to technology'* in general.

Control, ethics and digital technologies

It was clear from the research that organisations relied heavily on digital technologies to continue their work during the COVID-19 pandemic. Even before this, some participants expressed how much they relied on digital services functioning and performing as expected and the sensitivity of the information they stored: "*we use a Google Drive, it's our database. So, basically, it's where all our marketing material is, where all our budgets are, finances, meeting notes, documentation where our working group information is, where our contracts are... it has everything"* (INT3). However, participants expressed some concerns about ownership and privacy in relation to their data. For example, during the workshop, INT4 suggested their use of proprietary technologies represents an *'ethical trade-off'* in *'who the ownership of these companies and... who owns them and what happens with this data'*. For INT4's organisation, *"there was a lot of time spent exploring alternatives to Zoom or, you know, feeling uncomfortable using Google or all these different things"* (INT4/WS1). This hints at a conscious trade-off of privacy and control over data being made in the name of the convenience and familiarity of platforms such as Zoom and Google. INT11 summed this up as *'being led by technology'* – a feeling that the pandemic has forced organisations like theirs to *"make use of technology in certain ways'* and *'[do] a lot of innovating to work with technology"* (INT11/WS1). This feeling that technology adaptation is actively shaping the practices and activities of organisations is in sharp contrast to desire for control and autonomy that would be expected of those leading in the production of commons.

Control also appeared to materialise when contrasting against alternatives. For example, INT4 suggested that even with the questions of data ownership presented by proprietary technologies, sometimes familiarity with an undesirable platform was preferable to unfamiliar alternatives: "*when you find something that's like, perhaps like... find a platform that's perhaps a bit more, like, ethically situated, you know, you then fall into that kind of thing about distrust, that they're less familiar, you know, will you have that kind of overarching... usership, you know, is that another thing to download?"* (INT4/WS1). Perhaps summed up best by the idiom, *"better the devil you know than the devil you don't"*, this suggests that control by familiar and well-supported proprietary platforms may also extend to restricting the view of what alternatives are out there. This quote also raises questions of what it means to trust digital tools, suggesting a familiarity and dependability on its ills, rather than a confidence that the data will be used in an ethical way. Moreover, defining alternatives as *'ethically situated'* may suggest a desire for platforms to situate themselves in an ethical position that aligns with their values.

INT11 went further to suggest that alternatives to proprietary technologies may present new barriers. Clarifying the rationale for using Facebook for livestreaming their workshops as a desire to be 'accessible' – in other words, reach as many people as possible without barriers – they explained the challenge presented by alternatives: *"When we first started doing online sessions, I ran them on Facebook Live, purely because of accessibility. Loads of people could watch it there, and it's easy to search. We had another organisation who were interested in developing an online platform... we should all have a one stop shop where people can access different things and, you know, it would be like a place everyone could go and all the rest of it. And it just seemed like a huge amount of work to create a barrier to participation"* (INT11/WS1). For INT11, using an alternative to a familiar and well-used platform like Facebook would constitute putting up barriers for those who access their services. This has two implications. It reminds us of the power that such platforms possess to ensure they represent the 'default' technology, retaining a strong user base

and a digital ecosystem that leads to difficulty for users seeking out other platforms. It also raises important questions of what the alternatives are for those promoting the commons. In such a context, where is the room for alternative platforms, designed with commons values in mind? What would such a 'one stop shop' platform look like in the context of commoning? And are commons-friendly approaches to the design of technology compatible with values of ensuring accessibility?

INT11 also recognised the extra work required to convince those using their services that they should switch to an alternative platform. Referring to these as 'ethical platforms', and thus implicitly distinguishing these from 'non-ethical' proprietary technologies, they noted: *"you've then got to sell them on the fact that they need to get onto this ethical platform. And perhaps if they're using Facebook for other things, it's going to make them think, 'Well, actually I shouldn't be using Facebook at all'. So, you're then challenging their own assumptions about the ethical value of what they're doing in their free time"* (INT11/WS1). Here, INT11 seems suggest that convincing others to use an 'ethical platform' instead of Facebook could be perceived as judging them for their technology choices, which could be overstepping their boundaries as an organisation. The work of having to convince someone to use a different platform reinforces how the odds are stacked against alternatives to proprietary technologies, and it is unclear who should be responsible for such 'convincing'. It is ironical that such ethical alternatives would need to be 'sold' as a consumer choice, adopting the same approach as the platforms themselves use to generate users and income. All of this underlines a significant trade-off for groups utilising technologies to support commons efforts, between platforms driven by the values of such groups and ensuring technologies are accessible, trusted and enticing for people in the community to use.

Participants outside of the workshop also openly discussed the challenges of seeking out 'ethical' alternatives to proprietary technologies. For example, INT15 talked about being 'embroiled' in proprietary ecosystems like Google, and reliant on them for their day-to-day activities: "*once you're embroiled in something so deeply it's really hard to shift yourself off Google. I regularly think, 'If only we could move on to a different email server', like and be free from Google"*. This suggests a desire to move away from Google but doing so presents a challenge for a voluntary organisation limited in time, capacity and resources. INT15 has looked into alternatives in the form of open-source platforms, where the source code behind the platform is made freely available to be redistributed and modified. INT15 noted how they personally advocated heavily for alternatives in the organisation, but others saw it differently, like the draw of increased reach and familiarity using proprietary technologies mentioned by INT11: "*Not everyone is excited by or motivated by, like, these alternative structures and alternative politics [...] people would fight quite hard to maintain a presence on Facebook. Others would feel like it's a real problem that we've got a Facebook account [...] because there's so many annoying things about it, but other people would be like, 'why bother, there's many more important things to do"* (INT15). For others in INT15's organisation, open-source is seen as 'nice to have' but in the context of constrained resources and capacities, others feel they should not be given the same attention as more immediate material needs, such as their obligations to the community.

Desire for ethical control of digital platforms

Despite expressing concerns about adopting unfamiliar technologies, there was still a strong desire for exploring technologies that work differently. Specifically, they were seeking to reclaim some of the power that they felt they had lost to proprietary technologies and their 'black boxes'[71] of processing and control, and instead adopt greater control of the ethics and values underpinning these. By doing this, they would be able to better align the digital tools they use with the ethical configuration of their respective organisations.

Some of the mental health organisations interviewed spoke about the difficulties of using social media platforms that may be in fact exacerbating existing mental health issues. INT7 highlighted referred to the 'toxic' nature of social media cited this as a reason for wanting to create a new, self-managed social media platform for those accessing their support: *"[we're] hoping to take out all the so-called kind of toxic stuff that Facebook has in them, and in terms of*

[71] https://technology.tki.org.nz/Glossary/Black-box

you know likes and followers and, yeah, all of those potential negative aspects" (INT7). INT14 also remarked jokingly that Facebook is *'a bit like the Wild West'* and *'if you want an argument just go on Twitter'*, alluding to the lack of regulation over the content posted on social media platforms and the potential for negative implications on mental health. For INT7, having control over how social media platforms operated would enable them to tweak certain features to better account for the contextual specificities of a supportive, mental health-positive environment. Crucial to this would be the clearer ownership of data: *"creating an environment [...] where different community projects can exist on and individual organizations would move on to this environment and hold on to their own data, so that data doesn't belong to the environment as such"* (INT7). The ambiguities around how data are stored and managed entail scrutinising proprietary platforms. INT7 also reinforced that the move to adopt an alternative social media platform was a decision guided by the values driving their work. The intention behind adopting this platform was *'creating a tribe of compassion'* that centres values of care, solidarity, and mutual support, rather than competition. For INT7, ensuring ethical control by defining the rules of communication and the terms of use from the start would be key.

Several participants discussed open-source software as an ethical alternative and something they would be more able to control. Open-source software would give them the ability to modify the software for their own ends while knowing that the values driving its development are more in line with their values as community organisations.
For example, one noted that they *"want there to be an open-source software that we could all use"*(INT4/WS1) that did not lock them into a proprietary system and was free and easy to use; another remarked they used various open-source tools as *'standard, whenever we can'* across their work, motivated by a commitment to *'make resources available and free to use and free to develop'* and move beyond being *'tied into Google's way of managing information and permissions'* (INT15).

However, participants also spoke at length about their experiences of seeking out open-source technologies and the challenges they faced. For INT15, it was resistance and ambivalence within their organisation, and the realities of overcoming the dominance of proprietary platforms, that has made things difficult: *"Facebook and Google have just developed so effectively [and] made themselves indispensable... people coming in [to our collective] who've not had that experience of belligerently sticking with slightly less beautiful and streamlined bits of software, they're like, 'Why can't we just use Google? It's really easy and convenient and everyone knows how to use it'... you're only preaching to the converted if you decide to only promote using other channels?"* (INT15). INT15 had to be a strong and vocal advocate of it – *'extremely bloody minded'* – to see it adopted in their organisation. Indeed, when they adopted OwnCloud, an open-source software tool that allows you to host files on your own server, they had *'laid down the gauntlet a little bit'* and took charge of the initiative to ensure that it would work smoothly for everyone. For INT15, this was a reaction to resistance among those who feel open-source systems, often developed by volunteers, represent an unacceptable compromise on the sophistication and usability of the user interface, as well as accessibility of the platform itself. This apparent rejection of greater control in favour of mature, *'beautiful and streamlined'* software packages suggests that not everyone sees the benefits of greater ethical control offered through open-source technologies in the same way, and that these benefits need to be clearly expressed if they are to be adopted more widely. For some, adopting open-source technologies may just present an alternative, and similarly undesirable, trade-off to that required of trading-off ethical principles when using proprietary technologies.

INT4 shared a similar appetite to try out open-source technology for their work, yet did not feel that the organisation would be easily convinced: "*I've not been one to, like, make these decisions and I haven't really like felt like I've got an authority to broach it"* (INT4). This reinforces open source as being perceived as a non-natural choice compared with proprietary technologies. It also underlines the challenges of adopting such technologies in organisations with more hierarchical structures and the need for internal buy-in from those with the ability to influence the direction of an organisation. The constraints of time and other resources discussed earlier may also be limiting the exploration and adoption of open-source technologies: "*There isn't really the time to investigate a huge amount of stuff. That isn't necessarily a huge priority"* (INT4). Making software free and open to all is an underlying principle of open-source software, yet for INT4, time is the most precious commodity. It seems understanding all the open-source options available is currently an insurmountable task and undertaking it would slow down progress in other areas. Hence,

just because the software is available, it does not mean that it is accessible. Moving forward with their aims, there might be a need to compromise on software from 'equitable sources' in favour of progressing with the aim to build co-housing in their city.INT11 also highlighted the trade-offs that alternative systems may require: *"[it's] that trade-off between, 'oh, do we use something that's dead easy to get to, even if there are some ethical concerns with it?' With, 'no, we need a bespoke system that we have got ethical kind of control over, but actually is anyone going to use it?"* (INT11/WS1).

Therefore, adopting new and unfamiliar platforms based the quest for a more ethical alternative is not simple and may present its own issues and concerns for community groups such as the ones in this research. Moreover, it suggests these groups are facing a lack of support around following through with their intentions to find alternative technologies and are having to enter trade-offs that may inhibit their ambitions or lead to undesirable compromises.

5. Implications and recommendations from our work

We now discuss implications and recommendations based on the research around the accessibility of ICT tools. These implications derive from the research findings and highlight the important takeaway points from the analysis.

We first summarise our recommendations for the open source community. We then offer two sets of recommendation based on the findings around supporting groups creating commons resources and exemplifying commoning practices. These are based on the direct asks of the fifteen participants in our research, and the reflections on the opportunities and challenges they face in doing work in their respective communities. These recommendations aim at increasing access around ICT tools used to support commoning outputs and practices are aimed at those working in - or working to support - community groups, including practitioners, academics, and funders.

5.1. Recommendations from our usability study

The open-source community may wish to investigate addressing the following issues with the tools we tested.

Nextcloud Drive:

- Issues with image sharing when documents are shared externally
- Possible security issues with conversations in documents
- Lack of clarity around connecting calendar and contacts
- Providing further clarity in the interface on how the Markdown format works
- Condensing global documentation to a more manageable level
- Explaining requests for permission for notifications in the browser
- Setting an expiration date for deleted files and/or clarifying if one exists

Nextcloud Talk:

- Setting online/offline status and displaying this to other users
- Adding attachments and/or reactions to messages
- Enabling recovery of deleted conversations and messages
- Notifying users when someone is trying to call them or when they have received a message
- Showing all colleagues in a Nextcloud server on a list, rather than manually searching for them
- Clarifying that the plus button allows you to create any kind of conversation

Nextcloud Forms:

- Enabling recovery of deleted questions and forms, and/or adding a confirmation message before deletion
- Notifying users that when questions are deleted so too are the responses

- Preventing users from naming two items the same
- Enabling users to rearrange options within questions
- Enabling rich text and hyperlinks in the form welcome text

Nextcloud Calendar:

- Resolve interface issues arising from creating meetings across time zones
- Ensure that creators of events get consistently notified when someone accepts or rejects a calendar invite
- Simplify the process of deleting events
- Enable attachments to be added with meeting invites
- Enable tagging of events with real locations

Mattermost:

- Simplify the process of joining another team
- Explore the possibility of users creating multiple accounts with the same email, to enable them to join multiple teams
- Continue building on existing functionality and features

Cryptpad:

- Improve uploading and import functionalities, and clarify through the interface which kinds of files can be imported
- Consider ways of improving interoperability by enabling exports of document to more common formats
- Improve polling functionality and provide clearer guidance through the interface on how to use it
- Explore the possibility of implementing a password recovery function in a secure way

5.2. Recommendations from our community research

We now present recommendations based on our findings and from the key asks shared by our research participants. We have split these recommendations into two key areas: supporting technology design to help create and sustain tools that support those involved in generative commons work (5.2.1), and facilitating further research and collaboration on the topic of generative commons (5.2.2).

These recommendations are directed at technologists, practitioners, policymakers, funders, and researchers but are relevant to anyone working to support community-based work. As this was a small research study, the recommendations here should be taken as indicative areas for further exploration and suggested directions for extending the support given to valuable community work across North East England.

5.2.1. Supporting technology design

The COVID-19 pandemic has underlined the importance of selecting the right digital tools, but these tools may not always align with the values of community-oriented work. Many find free and open-source software useful, but for others, this may require trade-offs of usability, accessibility, and familiarity. For all the tensions they invite, some may seek out digital tools that are more convenient and enjoy an established userbase over tools that prioritise ethical control.

Digital technologies are tools to achieve other practices and goals, and not ends in themselves. Community groups need time and space to explore the possibilities of digital tools and what it can do for them. This could be achieved by **providing funding opportunities into research and development**, **plugging community groups into digital incubator schemes**, **building digital commons or tool libraries**, or **involving communities directly in the processes of technology design and evaluation**.

Moreover, there is an ever-increasing variety of tools, and the differences between them is not always clear. **Support could be directed at guiding community groups through the processes of technology selection and set-up,** drawing on the expertise of others who have been through a similar process. This may also help with increasing trust in open-source tools, which can lack the reassurances of mainstream digital platforms.

A key barrier is that the values embodied in technical systems are not visible or transparent. Currently, people feel that they do not have any control over digital platforms and are at the mercy of designers who build in undesirable features or data governance practices. By **exposing how these systems work and the values that guide them**, groups can make more informed decisions about which systems to use and take control of digital tools in ways that matter for them (e.g., combining proprietary tools with open-source alternatives). Two ways this could be achieved is by **sharing this information directly through platforms** or **inviting users to interrogate the design of platforms through a meaningful engagement process**.

5.2.2. Facilitating research and collaboration

Our findings emphasise the need to build knowledge and understanding around digital tools alongside granting access to them, with many carrying different functionalities and necessitating different trade-offs. **Efforts could be focused on building capacity to navigate, evaluate, and appropriate digital tools**, and **fostering collaboration between community groups and technology developers/researchers** aligned with the values of those working in communities.

A good start would be **creating the right conditions for this collaboration** – for example, by making meaningful efforts to involve community groups in technology design, and building this collaboration into project applications. This could help ensure that digital tools are designed with the values of these groups in mind, that they are developed more sustainably, and that community groups can rely on these tools being secure, efficient, and regularly updated.

Funding and capacity are significant barriers for community groups looking to interrogate the potential of digital technologies. A direct way of addressing this would be to **explore ways of providing funding to these groups for technology design, testing and evaluation**. Importantly, this funding should not be tied to delivering pre-set outcomes, but rather it should give groups the necessary breathing room to understand what works best for them in their context.

As researchers, it is vitally important that we **reflect on our role as partners within communities and how we can better support the stewardship of community resources to explore possibilities and overcome challenges**. This would be one way of ensuring that we move beyond the extractive nature of research to broaden and deepen the impact of our research for the benefit of those who need it most.

5.3. Continuing community engagement after the research

Continuing this work, we are currently designing an additional workshop to go deeper in our implications for technology design for generative commons. This workshop will build on: i) the empirical findings described in our usability evaluation and in our qualitative research (see section 4); ii) related work in Human-Computer Interaction and Participatory Design on digital commons and processes for the production of commons through technology; and iii) the toolkits developed by other partners of GE.CO (i.e. governance, participatory, legal etc.) which will be used as prompts to investigate technology as commons. The workshop will use speculative design as a way of unpicking the challenges of using open source as opposed to proprietary technologies, the ethical dilemmas involved in such values-led organisations and engage people in envisioning speculative digital tools that support the production of commons while also embodying their values. This work will also be important for the continuation of our community engagements, opening up questions about the sustainability of the GE.CO digital toolbox after the end of the project

and co-designing ways that the system administration work done through the GE.CO project take a form that can be re-used and re-appropriated.

6. Appendices

6.1. Jacob Nielsen's 10 Usability Heuristics

Nielsen Norman Group

Jakob's Ten Usability Heuristics

1 Visibility *of* System Status

Designs should *keep users informed* about what is going on, through appropriate, timely feedback.

Interactive mall maps have to show people where they currently are, to help them understand where to go next.

2 Match between System and the Real World

The design should speak the users' language. Use words, phrases, and concepts *familiar to the user,* rather than internal jargon.

Users can quickly understand which stovetop control maps to each heating element.

3 User Control *and* Freedom

Users often perform actions by mistake. They *need a clearly marked "emergency exit"* to leave the unwanted action.

Just like physical spaces, digital spaces need quick "emergency" exits too.

4 Consistency *and* Standards

Users should not have to wonder whether different words, situations, or actions mean the same thing. *Follow platform conventions.*

Check-in counters are usually located at the front of hotels, which meets expectations.

5 Error Prevention

Good error messages are important, but the best designs carefully *prevent problems* from occurring in the first place.

Guard rails on curvy mountain roads prevent drivers from falling off cliffs.

6 Recognition Rather Than Recall

Minimize the user's memory load by making elements, actions, and options visible. Avoid making users remember information.

People are likely to correctly answer "Is Lisbon the capital of Portugal?".

7 Flexibility *and* Efficiency of Use

Shortcuts — hidden from novice users — may *speed up the interaction* for the expert user.

Regular routes are listed on maps, but locals with more knowledge of the area can take shortcuts.

8 Aesthetic *and* Minimalist Design

Interfaces should not contain information which is irrelevant. Every extra unit of information in an interface *competes* with the relevant units of information.

A minimalist three-legged stool is still a place to sit.

9 Recognize, Diagnose, *and* Recover from Errors

Error messages should be expressed in plain language (no error codes), precisely indicate the problem, and constructively suggest a solution.

Wrong-way signs on the road remind drivers that they are heading in the wrong direction.

10 Help *and* Documentation

It's best if the design *doesn't need* any additional explanation. However, it may be necessary to provide documentation to help users complete their tasks.

Information kiosks at airports are easily recognizable and solve customers' problems in context and immediately.

NN/g

www.nngroup.com/articles/ten-usability-heuristics/

6.2. Usability testing findings

The issues in the table are sorted into three priorities. Red require immediate attention as they compromise the user's experience. Amber require short to medium term attention. Green are suggestions that would simply enhance the user's experience but are not issues that need fixing. In the resolution column, issues that have been fixed by us are marked in Blue. Those that are unresolved and would likely require attention from the open-source community are left unmarked.

NextCloud Drive

!	Issue	Functionality it affects	Recommendation	Resolution
1	Images in text files/notes not visible when shared externally; instead, they are asked to log in with the owner's details.	Any documents with images cannot be shared properly, limiting the serious adoption of these tools.	Enable images to be displayed on shared documents by passing through the image from the document properly.	This has been resolved You can share images with collabora now. It looks like NextCloud notes are tracking this issue here: [illegible]
1	Conversations in NextCloud Drive documents appear to be public, and anyone with the link can join the call as an anonymous 'guest'	Possible security and privacy issues. No apparent moderation of such conversations, opening up further possible issues.	Could restrict conversation features to those with a registered account. Links could automatically expire after a certain date, limiting the reach of possible issues.	**RA** Can't reproduce I tried opening a file conversation in another window and it said "Failed to join the conversation. Try to reload the page." Possibly out of scope – make a note in documentation that anyone has access to conversation and be aware of sharing passwords.
1	Names and emails of everyone who has signed up is visible in the People tab	Privacy. It may mean users feel uncomfortable signing up. There is no obvious way to hide their details or delete their account, meaning users have no control over their data once it has been used for signing up.	Concealing emails as a first step would help with privacy. Concealing names as a second step would address this issue fully.	Fixed by RA 13/4/21 (config issue)
2	Unclear how to connect calendar and contacts when prompted on welcome message	May cause confusion as the links do not do what they say they do. May prevent transition to the tool from other services / longer term adoption if	Offer help through a dialog box, or change links to the functionalities they suggest (i.e. connect calendar/contacts.	Out of scope

		these functionalities aren't available.		
2	Text files and notes are written in Markdown, but no guidance provided for how to use this file format	Many users may not be familiar with Markdown formats and conventions, creating issues for writing and exporting documents.	Provide guidance on how to use Markdown through on-screen dialogs and links to help guides for more detailed explanation. Longer term, consider embedding conversion markdown to more common text formats (e.g. *.txt, *.doc, *.pdf) to support chances of adoption.	RA: is this better with collabora?
3	User manual is too long to be used for occasional queries (99 pages)	Hinders ease of use and speedy troubleshooting	Linking a shorter help guide or a 'How-to' within the platform itself would help users	SP to address through documentation
3	Browser requests permission for notifications	May cause confusion as the reason for asking for permission is not explained. May be perceived as a security issue.	Auto clear the welcome notification (red dot) so it does not ask for permissions until a relevant notification comes through. Explain the reasons for needing permission through a dialog box.	Out of scope
3	Can't drag and drop files from the computer to NextCloud Drive	As this is built into other platforms (e.g. Google Drive and Dropbox), it would likely be expected. It may hinder ease of use and be perceived as a technical issue, rather than a limitation.	Embedding this functionality would improve UX and support greater adoption from other tools where this functionality exists.	**RA** When you drag a file over the NextCloud interface, certain parts highlight and if you drop it there it will upload to that destination
3	Deleted files have no clear expiration date	Some users may expect deleted files to be automatically cleared within a set timeframe, causing confusion. Unclear whether deleted files also count towards the user's data allocation, which if so deleted files may take up unnecessary space.	Set deleted items to automatically expire (e.g. within 90 days) Offer on-screen dialogs to make clear if there is an expiration date and, if not, reminding the user they may wish to periodically clear their deleted items.	Out of scope

NextCloud Talk

!	Issue	Functionality it affects	How to fix it	Resolution
2	Can't see whether colleagues are online or not or see who is online at a glance	This is a common feature of many other platforms (e.g. Slack) and thus may be expected by new users. It thus restricts it to an asynchronous platform, and hinders ease of use as there's no feedback on when or whether people will receive a message.	Display when colleagues are online and available to start a conversation.	Out of scope
2	Can't appear to add attachments or reactions to messages	This is a common feature of other platforms and thus may be expected. It also limits functionality as a communications platform and forces the user to share files through another medium.	Explore possibility of adding attachments and reaction functionalities (as on Slack). Encourage file sharing through NextCloud Drive as an alternative e.g. through an on-screen dialog.	Out of scope
2	Can't retrieve conversations I've left or deleted, even when done in error	If a user leaves or deletes the conversation in error, there's no way of retrieving it – something which may be frustrating and unexpected.	Implement a 'deleted items' or 'archived chats' function on NextCloud Talk to enable recovery of conversations.	Out of scope
2	Users aren't notified when someone is trying to call them	It's unclear when a voice/video call has started, meaning that the other person has to wait around or follow up on another messaging platform to confirm their attendance (possibly making NextCloud Talk redundant).	Notify the user that someone is trying to video call them, so they can join the conversation. This could be via a registered email for example.	Out of scope
3	Can't see colleagues listed at a glance and instead have to search for a specific colleague	Requires an extra couple of steps for many users to have to identify the name of the person who you want to talk to, and click through the start a conversation.	Consider displaying a list of colleagues in the redundant white space (i.e. in the left-hand column or central column).	Out of scope
3	No message read/received notifications	This is a common feature of other platforms and thus may be expected.	Consider building in received/read receipts into the chat functionality.	Out of scope

		Notifications only display when messages are replied to and when the platform is open, limiting its potential use as a serious chat platform. It may require users to use other chat platforms to notify that a message has been received, making NextCloud Talk redundant.		
3	Plus button tells the user they are creating a group conversation when they can also create a single-person conversation this way	May cause confusion, as the plus button seems a more instinctive way of creating a conversation than typing in the search bar.	Rename hover-over text to read 'Create a new conversation' to reflect ability to create a 1-1 or group conversation this way.	Out of scope

NextCloud Forms

!	Issue	Functionality it affects	How to fix it	Resolution
1	No apparent way to retrieve deleted questions or forms, and no confirmation message before deletion	This could lead to user errors (through no confirmation), frustration (in being unable to retrieve deleted items) and unintentional loss of data.	Add confirmation messages to avoid user error in deleting questions or forms in error (this confirmation message is given when deleting all responses to questions) Implement a 'deleted items' or 'archived questions' function to enable recovery of deleted forms.	Out of scope Out of scope It looks like form deletions are permanent and there is no-way to restore items
2	If two options are named the same, it doesn't display the results properly	If you were to name two options the same, the results are added together (i.e. a single response for each of the two same-named options would display as 200%)	Prevent the user from creating two options with the same name, or check with them if this was intentional.	Out of scope
2	No apparent way to rearrange options within questions	Users have to rewrite options again if they want them to appear in a different order, which is frustrating and could prevent its serious use.	Mirror the functionality for rearranging questions to allow users to rearrange options within multiple choice / checkbox / dropdown questions.	Out of scope It seems they are tracking this issue and it may be fixed in a future update: https://git.io/JugFM

		As it's possible to rearrange the order of questions, they may expect similar functionality for options, and a limitation may be mistaken for an error.		
2	If questions are deleted, then the responses to these questions also disappear	If questions no longer want to be asked in a live survey, then responses to these questions disappear. This could be overcome by downloading responses beforehand, but there are no warnings that this would happen. NB. Responses can be retrieved by retyping the question exactly again, but this causes issues in how they are displayed.	Confirmation messages to check if they want to delete items should prevent accidental deletion Insert warnings (e.g. dialog boxes) about altering the survey and how this will affect responses. Also note this limitation in documentation and encourage users to download any responses before making changes to the survey.	Same as the first issue
3	Hyperlinks placed in the welcome text section aren't properly recognised (i.e. aren't clickable)	Users cannot click through onto hyperlinks (e.g. for a company website for privacy policy), meaning they could navigate away from the form and find it difficult to retrieve it.	Automatically recognise hyperlinks when inserted into the welcome text	Out of scope

NextCloud Calendar

!	Issue	Functionality it affects	How to fix it	Resolution
1	Meetings created in different time zones don't work properly	Meeting end times change to match the time difference – for example, a meeting held with a 5-hour time difference can't be set shorter than 5 hours	Identify and fix bug causing the end time to change Remove time zone functionality until this is fixed to prevent user errors	**RA** Investigating It seems you have to set the time zone for the start and end dates separately (Imagine an event for flying to a different country)? Demo showed it was indeed an interface issue. Out of scope.
1	Creators of an event don't always get notified when someone accepts or rejects a calendar invite	Meeting organisers do not know who and who can't make a meeting, as it does not always display who has accepted the invite or	Auto generate an email to notify when someone has accepted or declined a meeting invite.	RA: Investigating

		not. Organisers do not get notified by email either. Further testing has suggested that if they have their email registered with Nextcloud, it can display as accepted on the calendar.	Figure out how to show whether someone has accepted a meeting invitation, regardless of whether they have registered their email with Nextcloud or not. Allow event organisers to manually update Nextcloud Calendar with responses.	
2	Difficult / not obvious how to delete an event	Have to click several buttons and enter the meeting proper to delete a meeting, which may frustrate users.	Consider how to enable speedier deletion of meetings, eg. through a Delete hotkey or a Trash icon when previewing a meeting.	Out of scope
3	Can't add attachments to meetings	Meeting organisers can't attach documents or images along with a meeting invitation. This may be frustrating as this functionality exists on other platforms	Consider how to enable users to attach files to meeting invites.	Out of scope
3	Can't tag events with real locations	The location field does not look up real locations to match invites to, as is possible on many other calendar platforms. This may frustrate users as they may be expecting this functionality here. Fixing it would also allow things to link up better with smartphone calendars. Although not tested, it can be assumed this would not link up with meeting rooms in an office either.	Consider how to enable a Location lookup in the location field when creating events.	Out of scope

Mattermost

!	Issue	Functionality it affects	How to fix it	Resolution
1	Video introducing Mattermost introduces CryptPad instead	May cause confusion among users of the toolkit	Move video to the Cryptpad box. Consider making a separate video to introduce users to Mattermost.	SP emailed Yilmaz 5/5/21 Suggest that video is taken down video for now
1	Names and emails of everyone who has signed up to the Mattermost service is visible when sending Direct Messages, even if they are not members of the team	Privacy – users aren't notified their emails will be shared in this way, and upon realising may feel uncomfortable. Users should not be able to DM people if they are not members of the team.	Concealing emails and names would address this issue.	**RA** You should only be able to direct-message people in the same team now
2	No clear way to switch between teams, and switch channels button could be confused for switching teams	This could confuse people trying to switch between different teams (in comparison to Slack, which makes it easy to do this). Switch channels functionality could be improved.	Change the switch channels button, which is redundant, to a switch teams button. Provide on screen dialogs or describe in the tutorial how to switch between teams easily. Consider explaining this in the documentation too.	**RA** Once you are in multiple teams an extra sidebar appears which lets you switch quite easily. Joining another team isn't as simple as it could be, you have to click on your current team then "Join another team"
3	Cannot create a new account if the email has already been registered before	Not significant, but it may confuse people or discourage them from creating a new team.	Consider if there is a way of users being able to create an account (e.g. to create a standalone team) Note this as a limitation in documentation	**RA** Note this in the documentation and clarify that one account can be in multiple teams.

CryptPad

!	Issue	Functionality it affects	How to fix it	Resolution
1	Some occasions where documents have not been saved when not logged in with an account, despite automatic storage being enabled	Would likely lead to frustration and loss of work. It also goes against what Cryptpad tells users in the UI. Only becomes clear later that creating an account is required to create a folder with documents	Important to note in documentation that creating an account is highly recommended. Failure of automatic storage functionality also be a cookie issue that needs noting in documentation	Add to documentation, fix likely out of scope

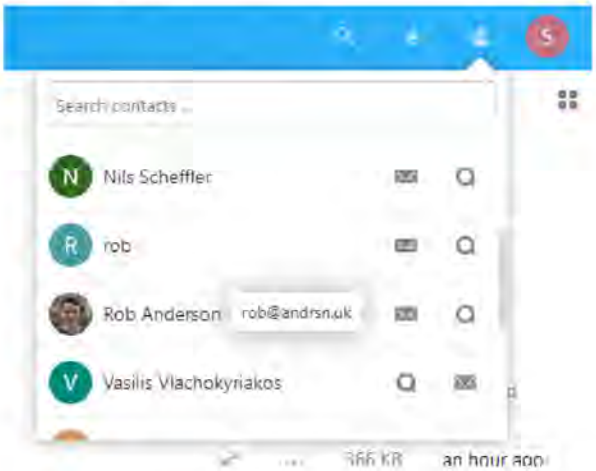
2	Uploading / import functionality could be improved. Unclear what files can be imported. Industry standard files e.g. Word and Powerpoint do not seem to be supported, but UI or guidance does not make this clear. Uploading doesn't seem to work and no feedback	These files can be imported but does not display correctly, which could make users think they have 'broken' it. Limits usefulness of importing function and interoperability.	Note limitations in documentation. Ideally, the user should be prevented from importing unsupported file types	Add to documentation, fix likely out of scope
2	Polling functionality could be improved. Votes do not seem to record. View/edit functionality is confusing and edit access is needed to participate. No guidance on how to participate	This limits their usefulness as a polling tools. It could lead to confusion, frustration, or security issues if different aspects of the poll are made editable	Note as a limitation and suggest e.g. that polls should only be shared with trusted people in your organisation	Add to documentation, fix likely out of scope
2	Formats for exporting documents (HTML, Markdown and JSON) would be unfamiliar for most and do not have interoperability in mind	Limits interoperability. People expecting the document to export to familiar formats, e.g. *.doc or *.txt, would likely be surprised / frustrated. Users would likely need to download new programs or read additional guidance to work with these formats	Note HTML / Markdown file format in documentation and suggest programs to convert / edit such documents	Add to documentation, fix likely out of scope
2	No password recovery function	This is noted when signing up, but new users coming from proprietary systems may be surprised at the absence of this option	Remind users in documentation	Add to documentation, fix likely out of scope
3	'Help Cryptpad' link in dropdown menu is soliciting donations but could be misinterpreted as a help link	Could cause confusion, especially when packaged as part of a free toolkit	Disabling functionality may not be the most ethical option but could note that Cryptpad is free software and supported would be valued by the developers	Add to documentation, fix likely out of scope

6.3 Usability testing reports

6.3.1. Nextcloud Drive

First impressions

- Video
    - Self-hosted – what does this mean?
    - How do I collaborate?
    - Does this allow me to store all my files?
    - Does this have storage limits?
- I need to register – should I log in with Google/Facebook?
    - Saves me creating a new account
- "Safe home for all my data" – what does this mean?
- Looks clean and organised. Can see what's been recently edited and how much storage I have.
- Good to have a few files for demonstration.
    - The manual is helpful, but it's very long (99 pages). **Could there be a quick guide?**
- The different categories (Recent, Favourites etc) all seem to make sense. Interested to find out what 'Tags' are.
- Top right: Can see my icon (S). Here I can return to the pop up and find settings.
    - Settings appear well organised, but there's a lot to choose from! I don't want to touch any of them for now.
- When I click on the people icon I can see all the other users signed up for it. When I hover over, I can see their emails/start a conversation. **This could be handy in an organisation – but in this version I'm not sure it's very secure? I'm worried about my email showing up there and someone I don't know talking to me.**

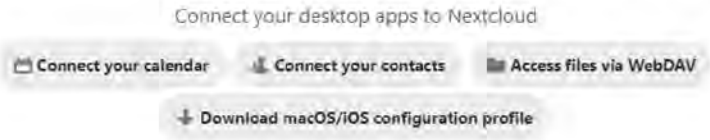


- Red dot by notifications. This comes up in the browser asking for permission to show notifications. Do I want this?

- Top bar – I can see lots of icons. When I hover over them it tells me what they are. This looks like a powerful tool!

User journey

- I've registered with an email, but now what? Do I press the back button?
- Haven't received the email, so had to request another verification link.
- Received two emails, but second one told me: Error - Invalid verification URL. No registration request with this verification URL is found. Tried first email and that worked.
- Created username and password.
- Welcome message explained how it works.
    - What does interoperability mean?
    - Where is this data actually stored? It doesn't tell me.
    - Clicked through to Nextcloud website, which gave me more information. Some jargon, though. Looks focused on businesses rather than people like me.
    - Does using this cost me any money?
    - Good to see I can use it on all of my devices.
    - **When I click through to some of the options, it isn't obvious how I can connect my calendar and contacts – they come up with manuals rather than ways to do it. Can I get help?**



- Accidentally clicked off welcome message. Can I get it back?
- I want to upload something – I can see the plus button can allow me to upload a file, create a new folder or create a text document.
- I uploaded a file and it only took a few seconds – great! I can also upload multiple things at once.
- I created a new folder – that was easy too.
- **It looks like I can drag things around if I need to – an easy way to move files and folders. However, I can't drag things from my PC into NextCloud, I have to manually upload them.**
- I can also right click and do a few things, like Add to favourites, rename and download.
- I can create a new text document for notes and meetings – that's great.
    - I can insert images, links etc.
    - It looks a bit different to what I'm used to, but I'm sure I'll get the hang of it.
    - I can share files – that's great! I can share it with my colleagues to get their input. I can make it secure by clicking the arrow to allow editing, password protect it etc.
    - I can also leave comments, and connect it to a project. This will really help me get things done.
- Link sharing looks like a really handy feature.
    - When I share a file, and tested opening it, they have the same view as me. When I see them in the document, they come up as an icon named after a vegetable/herb (Pumpkin, Galangal).

- **If they download it, they get an '*.md' file. What is this? Do they need to download a new program on my computer to access it?**
- **They told me they can't see images – when they try to click 'Show image', they have to log in. Why?**

- They can't see comments either, but they can get involved in chat.

- I like how I can start a conversation and a video call with people viewing the document. When my colleague leaves a comment, I can see it come up. However, I have to click 'Join conversation' to see it.
  - **These conversations are public and it appears anyone with this link can join the call as an anonymous 'Guest'. Is this safe?**
- When I add a photo to a document, I like how it adds it to 'My photos'
- **Deleted files – hidden in bottom left corner. Does this have an expiration?**

Some things I like

- Easy to use – I can drag and drop, right click and create new documents easily.
- It's clean and easy to understand – there doesn't appear to be lots of unnecessary features.
- I like being able to create new documents quickly and easily, for example to take notes in a meeting.

Some things that could be improved

- It'd be nice to be able to drag files into Nextcloud direct from my PC.
- Safety and security – when I share a link, anyone can comment or try to start a video call. Is there a way of restricting this, so I know I'm safe?
- Photos – people whom I share documents with can't see images. They have to create an account. Can this be changed?
- Can people's emails be hidden from the list? I'm worried about my data being shared with people I don't know.

6.3.2. Nextcloud Talk

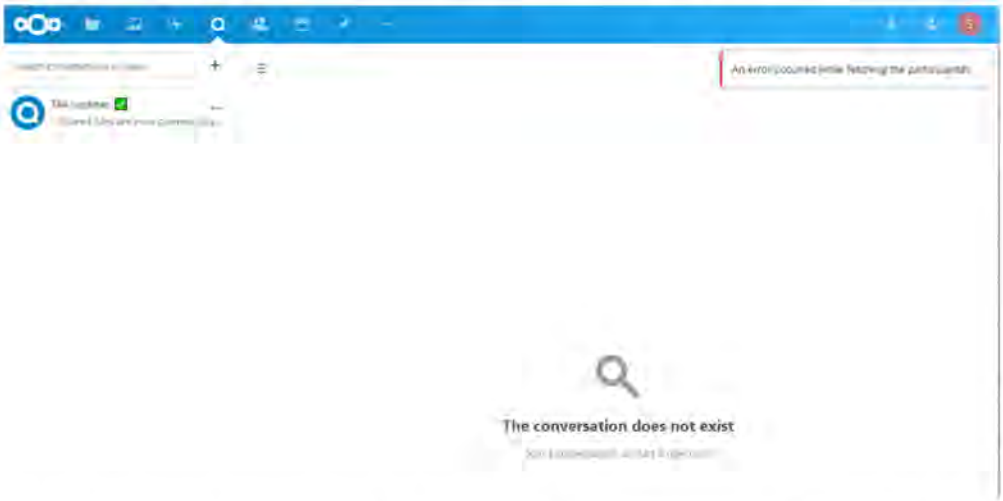
First impressions

- Video
  - Safe screensharing – good to know

    - Allows for contacting colleagues – useful
- I can see it's linked to Nextcloud Drive – that's handy.
- **I can't see where my colleagues are – would be nice to see this at a glance (rather than a big white space that's there now). And how do I know who's online?**
- It's good I can see the conversations I've had on my documents here – it all looks well linked up.
- The chat function looks a bit basic.

User journey

- I want to start a conversation – it looks like I have to search for a user.
    - This means I have to know who I want to talk to in advance.
    - **It would be nice to see who's online at a glance – like I'm used to on other messaging services.**
    - **It's also not clear if or when my colleagues have received or read a message, so it's likely I'll have to follow up with a message on another platform to check they've got it.**
- **The plus allows me to create a group conversation. That's great, but it should say that this button can also be used to start up a conversation with anyone.**
- The chat function is basic.
    - **I want to be able to add emojis and attachments – I can't see how to do this?**
    - That being said I can reply directly to messages like in Whatsapp – that's handy to keep track of conversation.
- I can see that by pressing the three dots I can change how I get notified about conversations - that's good.
    - I can also share a link to the conversation. Handy, but when I sent it to my colleague, they had to register to see it. Should external people be able to join into a conversation without signing up? This is good from a security point of view, but perhaps less so from a usability perspective.
- I've accidentally left a conversation – but I can't see any way of getting it back! I can't see a bin to retrieve it from. How annoying!
- I accidentally opened up a conversation with someone, but then deleted it straight after. However, I got this error message. What does it mean? Does this message go to them too?



- On smaller screens, I can see that the side bars automatically disappear. That keeps everything looking tidy.
- I like how video calls are integrated with this too.
    - The video calls seem simple to use. I can do screensharing, mute and turn on/off my camera – just like I can with Zoom and Teams at work.

Some things I like

- It's easy to use and talk to other people in my team.

- It's nice I don't have to register for this twice – it just links up with Nextcloud. I can also see conversations I've had on documents there, too.

Some things that could be improved

- I can't seem to attach anything to conversations, like files, or send emojis. I can do this on Whatsapp, so why not here?
- If I accidentally delete a conversation, I can't seem to get it back – could there be a bin to restore conversations?
- The video calling feature is good, but it needs some explanation on how it works – do other people in the conversation get notified?

6.3.3. Nextcloud Forms

First impressions

- Video
    - Form and survey platform – what's the difference between this and LimeSurvey?
    - CSV – uses same format as Google Forms
- Again, I like how I only need the one log in.
- Looks clean and simple. Easy to see how I can create a form – on the side bar or in the middle.

User journey

- Creating questions in a form seems easy. I can choose from checkboxes, multiple choice, dropdown, short answer and long text.
- I can also put in some welcome text.
    - However, I can't seem to put in images or links here.
- I like when I type in one option, it automatically creates another option underneath.
    - I can press enter to go to the next one – very intuitive.
- I can make a question required too, which is helpful.
- I can rearrange questions, which is handy. But what if I need to rearrange a few options in a question? I can't see how to do this. That's a pity!
- It seems easy to share a form with others for them to fill in, and the results appear instantly in the 'Responses' tab.
    - It also gives the responder a confirmation message when they have submitted their survey.
- I can see both a summary of the results and the individual responses, just like Google Forms.
    - Can I share the results with others, too?
- A settings button next to Responses lets me choose how I share the link, whether I can allow multiple / anonymous responses and set an expiration date.
- Like in Talk, there is no Recycle Bin for forms I've accidentally deleted.
    - **At least it gives me a confirmation message, ensuring that I definitely want to delete it, so this should help me to avoid silly mistakes.**
- **A minor issue to avoid – if the options are named the same, it doesn't differentiate between them and doesn't split correctly. So, each option needs to be uniquely named.**

Things I like

- Clean and simple – no fancy features or limits on how many questions I can have (like Survey Monkey).
- The results are displayed as a summary and as detailed responses – this will allow me to do some analysis on any surveys we do.

Things that could be improved

- Could I add links and images to the welcome text, e.g. if I need to show them a privacy or data notice?
- It'd be nice to be able to rearrange options within questions – instead, I have to write them out again.
- Having a 'Recycle Bin' for forms you've deleted would be good.

6.3.4. Nextcloud Calendar

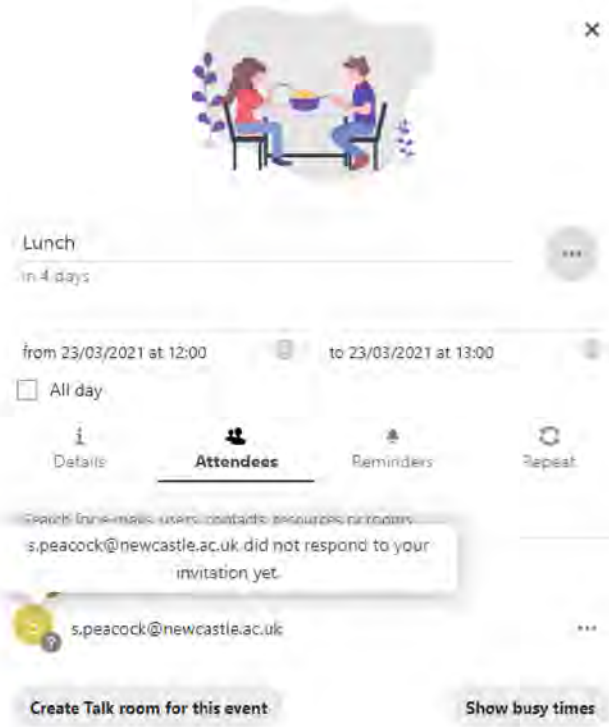
First impressions

- Calendar looks like many others. It seems easy to create a new event by pressing the blue button on the left, or clicking on any day and specifying a time.
- It's a bit blank for now, but I'm sure we'll fill it up!

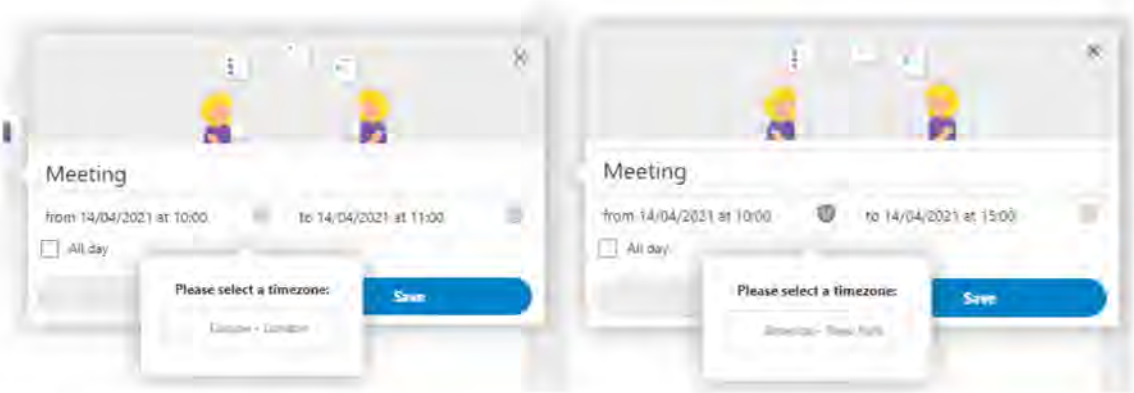
User journey

- Creating a new event is really easy. It reminds me of Google Calendar.
- I can specify time and date of an event as well as timezone by looking up the city – handy if we ever have international colleagues.
- I like how some meetings come up with a relevant image, such as Lunch or Meeting – again, just like Google.
- I can edit events by clicking on them and changing the name/time.
- If I click More when creating/editing an event, this brings up lots more customisation options.
    - I can add a location – although I wish this had a look up function.
    - I can also add descriptions, change permissions, change colour, set reminders and reoccurrence…
    - Hovering over the 'i' next to each field gives me a bit more explanation for each field.

- **To delete an event, it's a bit more tricky. I have to go into More, and then click the three dots.**
- I like how Tentative events show as greyed out, and cancelled meetings crossed out.
- *When I tried adding a category to an event, this broke the calendar! Everything I clicked on after this didn't work. When I did a hard refresh of the page, it started working again. I couldn't recreate the error.*
- I really like how invitations that get sent to others contain all the same detail – tags, location, description etc and a link to a video call.
    - **When someone declines an event, it also notifies the owner of the calendar (via the email they signed up to Nextcloud with)**
    - **However, unfortunately it doesn't seem to update on Nextcloud itself – it just says they haven't responded yet.**



- I can change the view between Day, Week and Month, and toggle calendars on and off.
- I can also create a new calendar if I need to, as well as create task lists and subscribe to all my other calendars. These are read-only, but it's handy to be able to see all my calendars at a glance.
- Another issue: if I organise meetings in a different time zone, it automatically changes the start time to my region, but not the end time.
    - For example, if I create a meeting 11am-12pm Athens time, and I'm in the UK, my calendar thinks the meeting will run 9am-12pm BST.
    - **I think this is a bug in Nextcloud: if I try creating an event behind BST (e.g. EDT) there's no way to make a meeting shorter than the time difference, i.e. meetings in New York time cannot be shorter than 5 hours.**



Things I like

- I like how it's simple and easy to use and linked up with Nextcloud (e.g. so I can add a Talk invitation).
- I like how all of the details I put in a calendar invitation pass through to an invitee.

Things that could be improved

- It would be nice if my calendar updated to show when someone has declined an event – otherwise I have to chase them for a response by email or Talk.
- I wish it was easier to delete an event.
- I wish the location field had a look-up function to tag a particular location or meeting room in, like on Google Calendar.
- It would be nice if I could add attachments, e.g. agendas or minutes to a calendar invite.
- The bug in time difference between meetings needs to be fixed. This is especially important for users holding meetings in different parts of the globe.

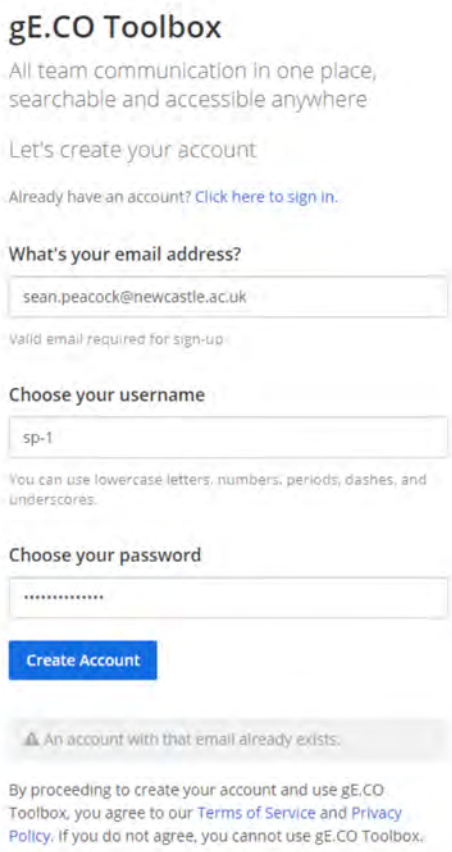
6.3.5. Mattermost

First impressions

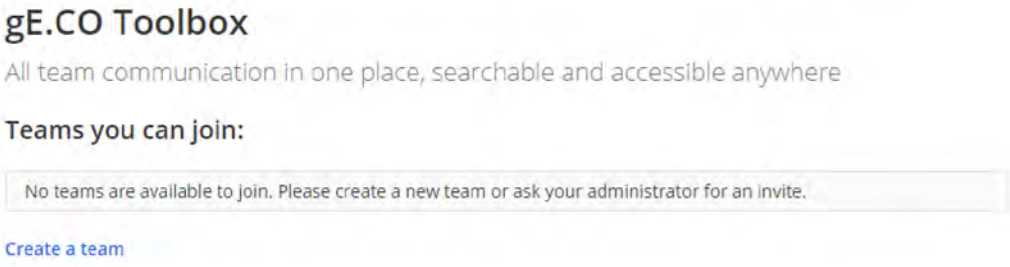
- Have to register with different details to that of Nextcloud – would be good to know this in advance.
- Video: **shows how to use Crypytpad, not Mattermost! This is confusing.**

Journey

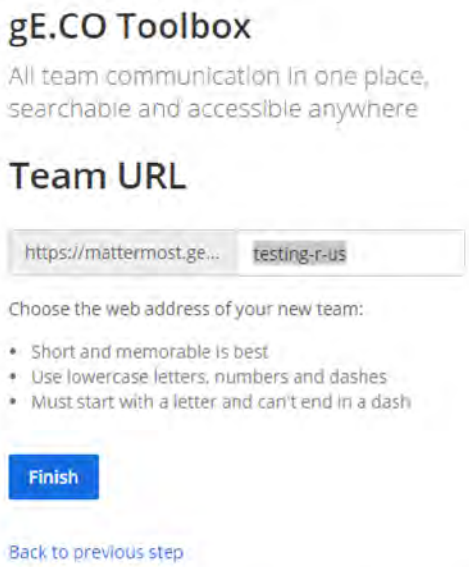
- **Seems I can only have one account per email. On other platforms, you are allowed to sign up to multiple workspaces with the same email.**

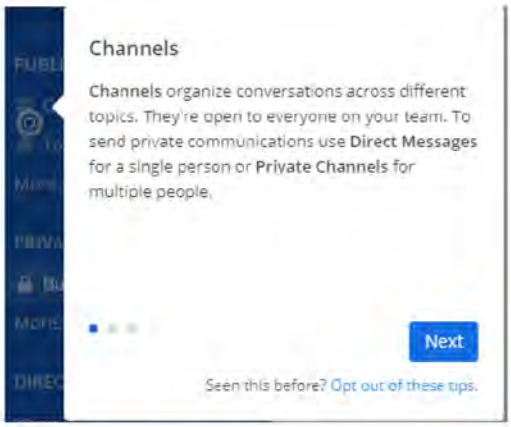


- Need to create a team. It's a shame I can't see how it works e.g. through a demo before creating a team.

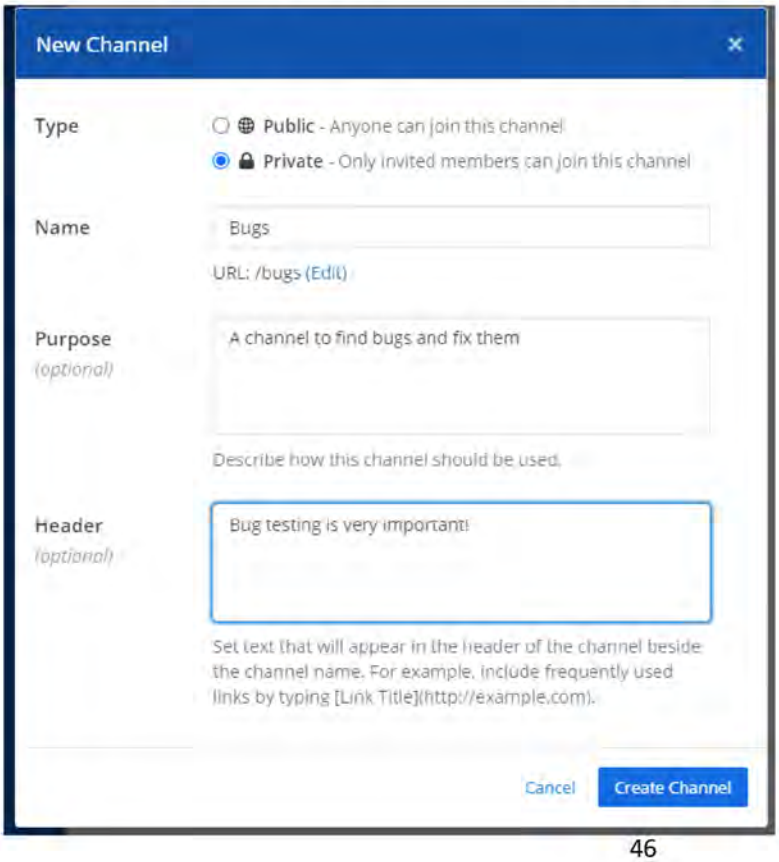


- Creating a team seems easy – I like how I can customise a team name.

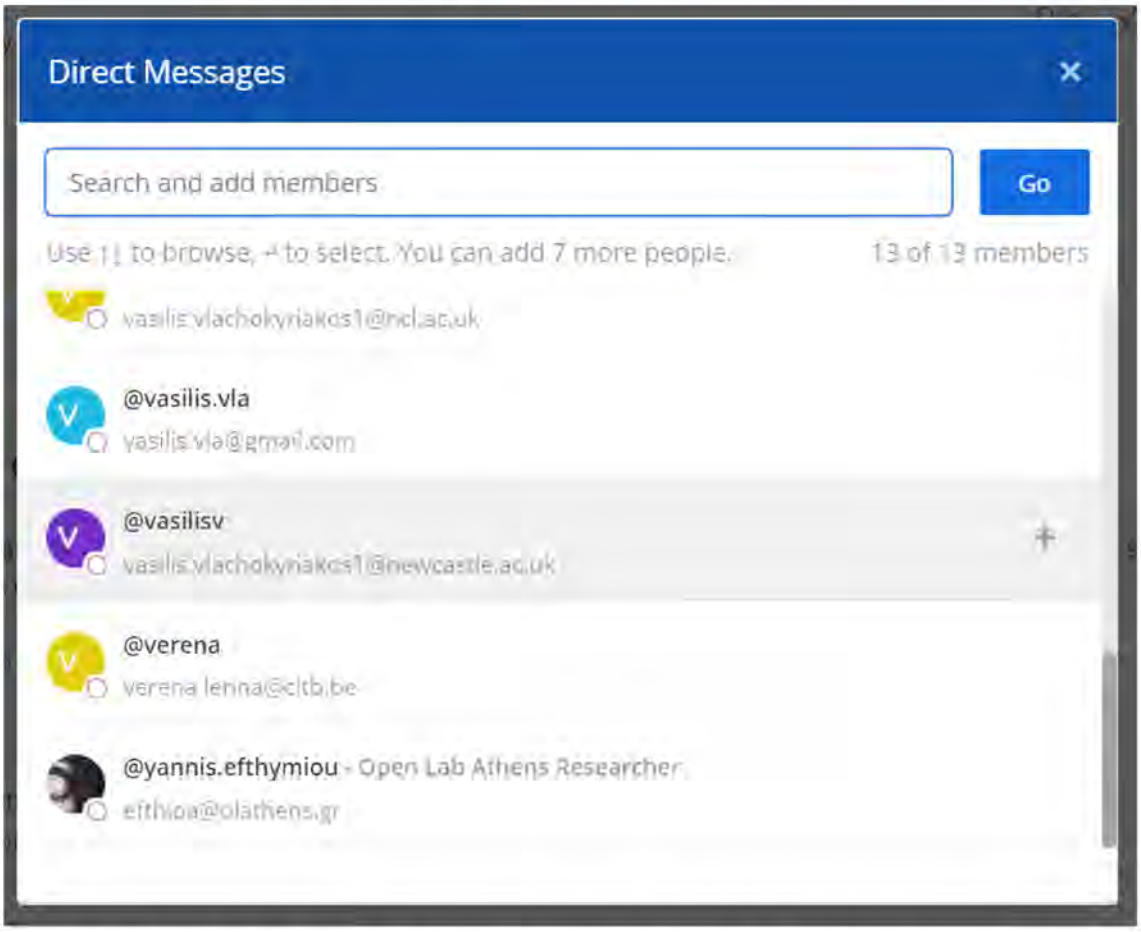




- Once created, the team space opens, and I'm offered a tutorial. It's nice to know I can use it on different platforms.
    - I also like the tips that pop up that explain how to use particular features.
- Town Square seems to be the main channel. It's good to know I can create other channels for different tasks, such as Comms or Marketing.
- For this to work, I definitely need to invite other people…
- I can also create private channels. I assume these are invite only.



- When I revisit the gE.CO toolbox, it's remembered me and kept me logged into my team space – handy that I don't have to log back in again.
- Direct messages – it's handy to be able to drop messages to people directly in my team
    - It's good I can set up group messages.
    - It also shows who's online with a little green tick beside my name.
    - I can also share files directly from my computer and use emojis.
    - It seems I can message anyone who's registered with Mattermost, whether they're in my team or not. **Is this a privacy risk? Do people who have signed up for this know their emails are going to be shared in this way?**



- **I instinctively find the 'switch channels' button confusing – I keep thinking that it means switch between teams.**
    - If I am a member of two teams on Mattermost, instead I have to log out and log into another channel. I don't have to do this when I've used Slack or Microsoft Teams.
- The import tool allows people to import messages from Slack, which may be very helpful to help people make the switch to Mattermost.

Things I like

- It's easy to create a team and message my colleagues.
- There's a lot of functions like channels and direct messages, to keep my communication organised.
- Easy to make the switch over from Slack with the import tool

Things that could be improved

- Should I be able to message anybody who's registered to the platform? Perhaps the feature should only allow me to message those who have joined my team for their privacy.
- Could there be a way of switching between teams? The button could replace the switch channels function, which I don't think is very useful.
- The introductory video should be updated to give a tutorial to Mattermost, rather than CryptPad.

6.3.6. Cryptpad

First impressions

- I was told it's a bit like Google Suite?
- I'm greeted with a page where I can create a new pad. It's good I can create things straight away without signing up.
- The notice says that I need to create an account to 'keep them alive'. It's good I have the option, I just hope that my work doesn't accidentally disappear if I accidentally clear my browsing history.
- It certainly looks and feels very secure, with talk of it being encrypted.
- The interface looks clean and simple, perhaps a little too simple? The Rich Text pad remind me of Notepad on a Windows PC.

Journey

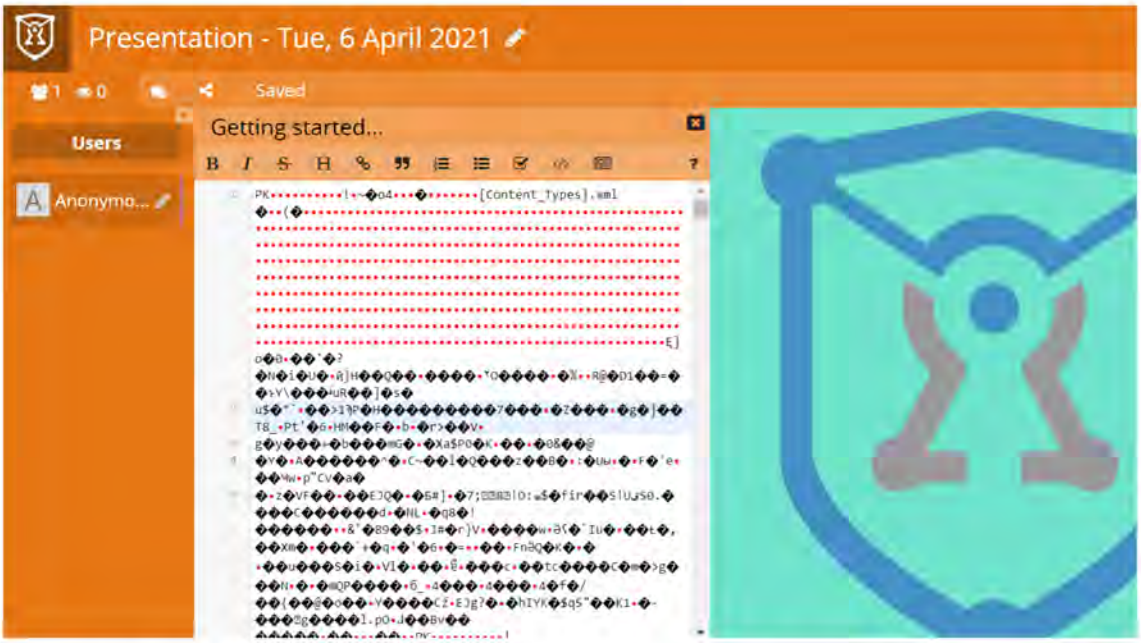
- Clicking the link brings me to Drive.
- Clicking the icon in the top left brings me to a different page – all the links work apart from Pricing (which comes up with Error 404).
- I created a new pad (Rich Text), and my browser asks if I want to allow notifications. On the pad, it appears easy to start typing whatever I need.
    - The word count feature is very useful.
- I can see it's set up for sharing, with a list of users on the left (so far just me). But it's far less obvious how I go about sharing this.
    - The icons I need are small and a little vague – the main icons I need (chat, share, bin and more options) are much smaller than the ones in the top right.
    - The speech bubbles are for chat and the three dots for sharing.
    - The speech bubble was flashing at me, but this was just announcing its presence.
    - The three dots hides a lot of useful features
- **The document shows it's saved, but where? I'm not comfortable using this for important stuff, as it doesn't show me where the document is saved or if I can move it to a folder.**
    - **As I feared, when I closed the document and returned to Drive, it had disappeared. What is going on?**
    - **Perhaps I need to register for it to save, but this goes against what CryptPad has told me.**
    - When I have saved the link, I can return to it, but I just wish the file would display in my Drive.
    - It looks like it's the same for other pads.
    - Even when I select Automatic storage in settings, it still doesn't seem to work!
    - The only time it seems to work without an account is it I export the link, open it in a new Private tab, and import it that way.

- On Rich Text, the export and import features could use more work. I can export a file to HTML, but I'm not sure what to do with this?
    - The print to PDF function is perhaps more useful, but it's still hard to edit a PDF document.
    - It's not obvious, but with some testing, I can only import HTML files.

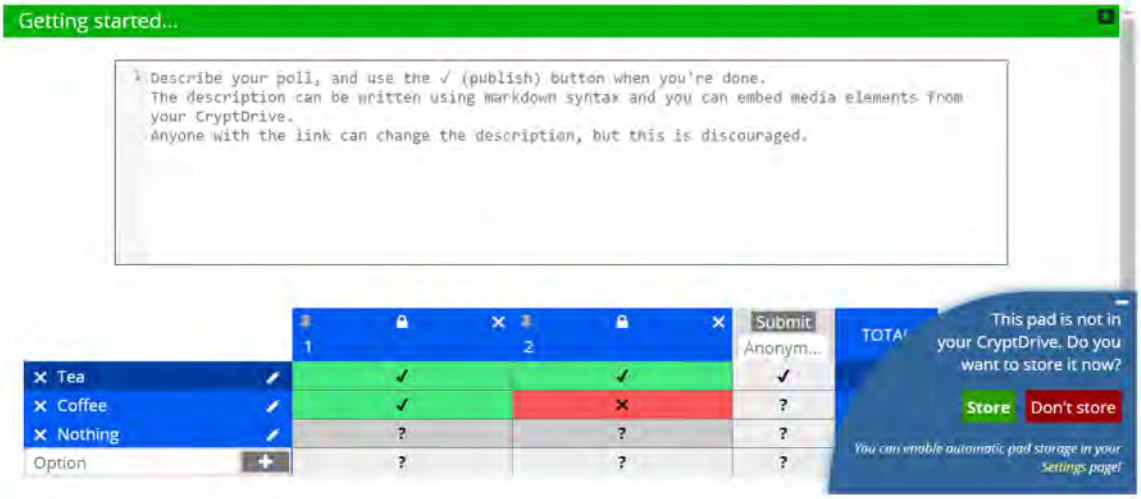
- **I tried to import a Word document and it broke it, with no way to go back to what I was doing. HTML is a weird file for writing a text document!**

- I'm a bit confused by the pop up saying 'We need your help!'
  - It's told me I can consider supporting the project – is this the gE.CO project they are talking about?
  - It looks like they are asking for donations, but I thought the project was funded by the EU?

- The presentation pad needs a lot of work. I can't add images, and I can't see where to add a new slide. It only seems to present text.
  - It looks identical to the code editor, so perhaps it's designed more for this and less for serious presentations?
  - I can only export as a 'md' (Markdown) file. How could I use this as a presentation?
  - Equally I can't import a presentation from elsewhere without appearing to break it. This was my attempt to import a PowerPoint file!



- Polling is complicated. The range of questions is limited to Yes, No or Maybe options from a list.
    - The interface is a bit clunky, with the submit button being at the top, and it not being obvious I need to replace 'Anonymous' in the box to my name.
    - However, I do like the commenting features – it allows for discussion beyond the poll itself.
    - **There's only a View or Edit mode, meaning anyone I share this with can edit this! It doesn't really work for what I need.**

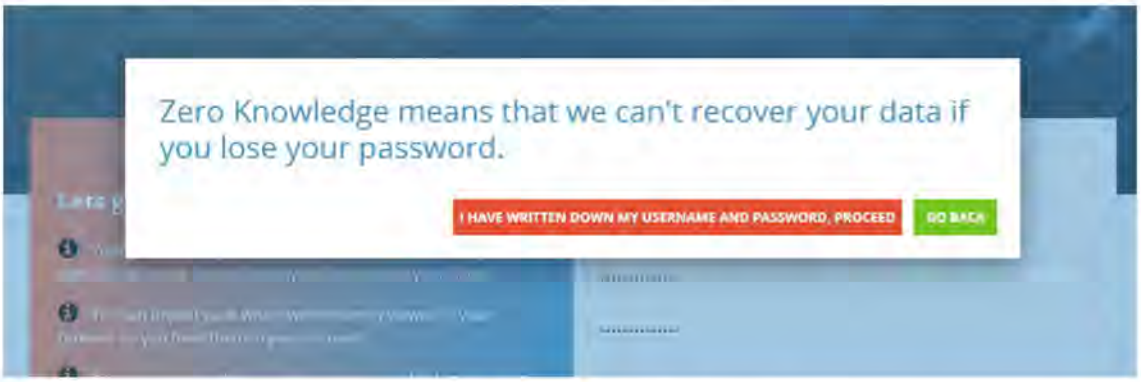


- The Kanban board is perhaps the best thing about CryptPad.
    - It's a simple and lightweight version of Trello, with the ability to create new boards for projects and tasks.
    - I love being able to organise boards and tasks by simply dragging them.
    - I like how it doesn't have all of the clutter that Trello has – it just appears very simple to use.
    - I can change the title and colours of boards to anything I want – this will really help with organisation.
    - I can also share this board with colleagues and we can organise everything together in real time.
    - The disadvantages are there's no bin for accidentally deleted tasks (e.g. Trello has an archive function) and no functionality to add media or attachments to tasks.

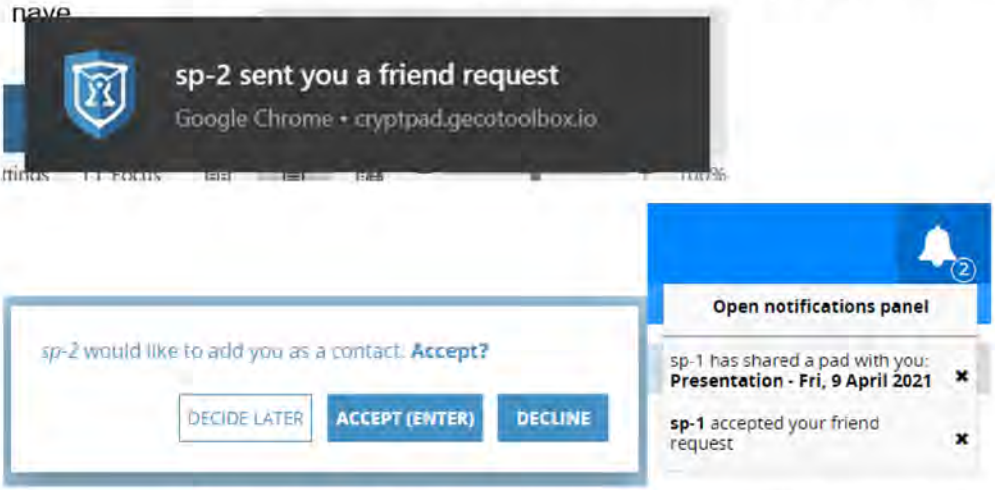
- **Exporting a board isn't particularly useful – it comes in a 'JSON' format, but I don't know what that is or how I can use it. Some guidance on this would be helpful.**

- Sheet works well too – it looks identical to Excel in fact! It's really simple to use and has all the features I'd expect. As is To Do and Whiteboard (although I'm not yet sure how I'd use Whiteboard).

- **When signing up for an account, it's important to remember there is no password recovery function. They make this very clear, but it's just worth remembering to take your time on setting this up.**
    - **However, now it's clear that creating an account is required to create a folder with documents. This is important to make clear at the start!**
    - Being registered opens up a lot of features – for example, I can upload files and folders, create shared folders, create templates and recover files from the Trash. This feels more like it!
    - However, the allocation here I've been given is 50MB – is this enough?

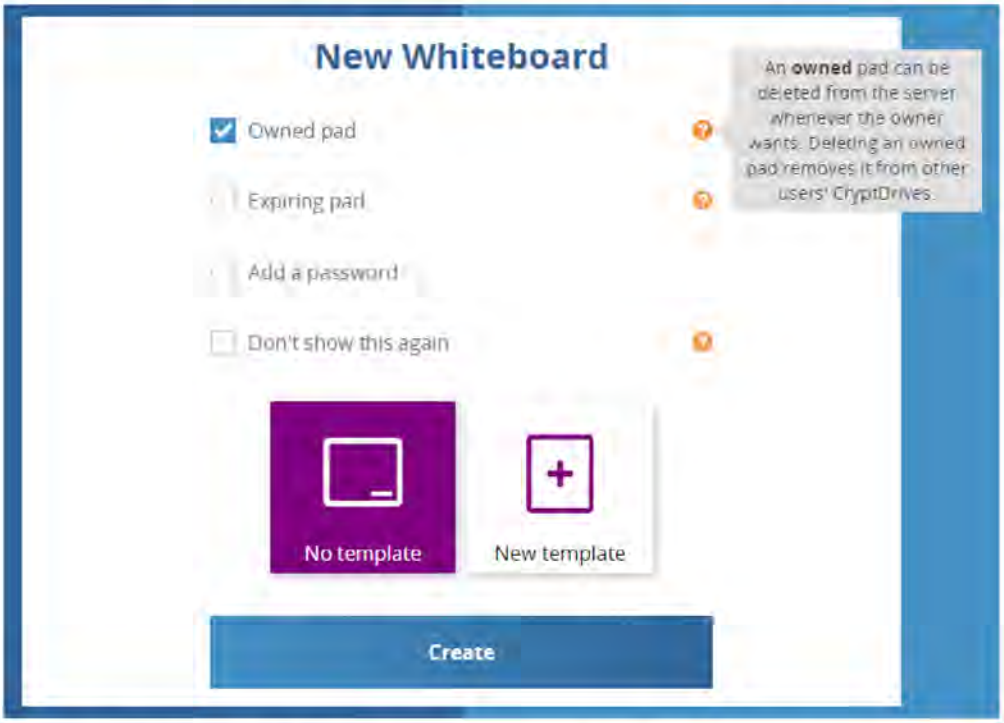


- Getting my colleagues onto CryptPad seems straight forward.
    - If they have already signed up to CryptPad, they can send a 'friend request'. It then gives me a desktop notification and in CryptPad.
    - I can then share documents directly with this contact. I can then edit the same document and chat with this contact - meaning I can do everything in Cryptpad, should I want to.



    - Chatting doesn't have the most intuitive interface – it's done via the Contacts option. It still seems to work well.

- A small thing – but **when creating a new document, and clicking on the top two question marks for more information, they come to an Error 404 page. This links to an FAQ page that does not yet exist – perhaps the links should be removed.**
    - However, I do like the options here to decide whether it is owned, expiring or password protected.



- **'Help Cryptpad' link in dropdown menu is soliciting donations but could be misinterpreted as a help link**
    - This could cause confusion, especially when packaged as part of a free toolkit.
    - Disabling functionality may not be the most ethical option but could note that Cryptpad is free software and supported would be valued by the developers

Things I like

- It's packed with features, and has all of the programs I could possibly want.
- Security is a focus, and I feel secure using it – I like how I am anonymous using it, and I can choose how much of my data to give out.
- Rich Text, Sheet and Kanban are perhaps the best programs to use.
- Once I've decided to create an account, I can use all the features just like I would Google Drive, including uploading files and folders and creating templates for my most common documents.

Things that could be improved

- Saving a pad is tricky. It's a risk that someone could do all this work and not realise that it's not saved automatically in their 'Pad'.
- It would be nice to be able to export to familiar file formats, to allow me to share and work offline on documents. Replace *.md, *.json and*.bin files for Open Document formats, if possible, or explain how to use these programs on a Windows or Mac computer (e.g. what programs do I need to download in order to open them).

6.4. Interview schedule and list of participants

Research questions

- How can digital tools support inclusion in the production of commons and commoning practices?
- How do commons organisations use digital tools?
- What is the appetite for open source technologies from commons organisations?
- How can these tools be accessible to communities involved in the production of the commons?
- What are the experiences of underrepresented groups in the commons?
- How can these tools support the inclusion of underrepresented groups in commons?

Interview introduction

- I'm interested in community organisations like yours and how they work.
- I'm conducting research on a European project that looks into the commons – specifically, bottom up community organisations and how they share and provide resources for the wider community.
- I'm particularly interested in those that help to regenerate underused/vacant spaces in the city.
- I'm also keen to explore the role that digital technologies could play in supporting these orgs and involving those who don't normally get involved in things like this.

Questions

Tell me more about your initiative / project / organisation [the groups you're involved in].

- What is its purpose?
- Where did your work begin? How did your initiative start?
- What projects are you running at the moment?
- Who is your work aimed at / who does it support?
- What impact does your work have on the community? / Who is your work for?
- What are the political values driving your work?
- How do you interpret [your mission/vision/slogan]?
- How did [project] come about and how does that work?
- How does your work speak to the commons?

What is your role in the initiative?

- What is your role within your organisation?
- How did you become involved? What was your personal motivation for doing this?
- What is your background?

How is your organisation structured / governed / organised?

- How would you describe the governance structure?
- Who makes decisions, and how? Is there a core team of people who makes decisions? Or is it more horizontal?
- Broadly speaking, what are the demographics of your organisation?
- How do you organise?
- How important is your physical space to your work?
- Do you face any challenges in running your organisation?

How do you do your work in your organisation?

- How do you communicate / organise?
- How do you complete tasks / projects or share responsibilities?
- What resources do you need to do your work?

Does your organisation reflect on who is and isn't included in your work?

- (If relevant) Anyone can get involved – what does this look like in practice?
- Is there anyone you wish you could support / reach out to but currently do not?
- Do you make specific efforts to include marginalised groups? If so, how?

Is anything you wish you could do more of in your organisation?

- What are the barriers to doing more in your organisation?

How has COVID-19 impacted the ways that you do your work?

- Do you have a physical space? If so, what have you lost in not having access to this during COVID?
- Aside from COVID-19, do you think your work or the ways you do your work will change in future? If so, how?

What are your experiences with using digital technologies in your organisation?

- Do you use any digital technologies to support your work? If so, which ones, and what do you use them for?
- How confident do you and your colleagues feel in using digital tools?
- What do you look for when you are deciding on digital technologies to support your work? (e.g. is Open Source a consideration)?
- Do you reflect on the ownership of data and technologies when using them?
- Do you face any challenges in using digital technologies in your work?
- Are there any shortcomings in the current technologies that you use?
- How would these technologies need to be different to better support you and your work?

The following table shows the fifteen participants in this community research, categorised based on their activities and location.

Code	Organisation	Location	Type of work	Categorisation
INT1	Whitley Bay Big Local	Whitley Bay	Community development; community resource (centre)	Community development
INT2	Stocksfield Community Association	Stocksfield	Property; Community development	Community development
INT3	Dwellbeing	Newcastle upon Tyne	Artistic intervention; Action group	Influencing action
INT4	A local co-housing initiative	Newcastle upon Tyne	Shared housing	Physical assets
INT5	A local co-housing initiative	Newcastle upon Tyne	Shared housing	Physical assets
INT6	Glendale Gateway Trust and other local initatives	Wooler	Property; Community development; Community resource (various)	Community development
INT7	Chilli Studios	Newcastle upon Tyne	Mental health support; Artistic intervention	Targeted support
INT8	Shieldfield Art Works	Newcastle upon Tyne	Artistic intervention	Influencing action
INT9	Scotswood Garden	Newcastle upon Tyne	Community resource (garden)	Physical assets
INT10	Meadow Well Connected	North Shields	Community resource (centre)	Community development

INT11	North Tyneside Arts Studio	North Shields	Mental health support; Artistic intervention	Targeted support
INT12	Greening Wingrove	Newcastle upon Tyne	Community development; Action group	Influencing action
INT13	Kittiwake Trust and Borderline Books	Gateshead	Community resource (library)	Targeted support
INT14	Recovery College Collective (ReCoCo)	Newcastle upon Tyne	Mental health support	Targeted support
INT15	Star and Shadow Cinema	Newcastle upon Tyne	Community resource (cinema and events space)	Influencing action

6.5. Workshop schedule and list of participants

Activity 1 – Who do we have here?

Use the post it notes tool to the left-hand side of your screen if you want to add your name and that of your organisation. If you would rather remain anonymous, you do not need to fill this in.

Activity 2 – Now let's get to know each other a bit better...

Use the post it notes tool to the left-hand side of your screen to respond to the questions below. Feel free to mix colours and move notes to be next to each other if you are seeing some things in common.

- **What** community resources do you and/or your organisation is engaged in creating or sustaining? **Who** are these resources for?
- **How** are these resources managed? **Who** takes care of them?
- What **motivates** you to do this work?
- What **digital technologies** help you create, maintain and share your community resource? How?

Activity 3 – First… explore some challenges and opportunities, then… prioritise these

In your groups, pick from the prompts below and discuss them. To what extent do they speak to you? Do you agree/disagree with them? How does this play out in your organisation?

- Appropriation and workarounds
  - 'Technologies don't always work perfectly, but we use multiple different 'hacks' or 'tricks' to get technologies to work for us.'
  - What are the things you have to do to make tech work for you?
- Trade-offs in technology
  - 'We use technologies that are easy to use for people and mostly out of habit. But many people distrust them.
  - What trade-offs do you make when choosing and using technology for your work?
- Technology support
  - 'We would love to experiment with new technologies, but we need support to build or maintain them.'

- What would new technologies enable you to do that existing ones don't?
- What networks of support do we need to make that possible?

- Adapting to pandemic
  - "We really value our physical space, and we've struggled to adapt during the pandemic. During the pandemic those who are digitally excluded are often the ones that need our support most."
  - What challenges and opportunities has the pandemic posed in your ongoing work of creating, sharing and maintaining community resources?

- Accessing resources
  - 'We'd love to make our resources open to everyone, but we also have a responsibility to look after and protect them.'
  - What tensions and challenges do you face in widening access to your community resources?
  - What strategies do you employ to open participation and access, while protecting the community resources?

From the points made above, what are your three priorities to tackle?

Below is a table of the participants that took part in the workshop.

Code	Organisation	Location	Type of work	Categorisation
INT4	A local co-housing initiative	Newcastle upon Tyne	Shared housing	Physical assets
INT6	Glendale Gateway Trust and other local initatives	Wooler	Property; Community development	Community development
INT9	Scotswood Garden	Newcastle upon Tyne	Community resource (garden)	Physical assets
INT11	North Tyneside Arts Studio	North Shields	Mental health support; Artistic intervention	Targeted support
INT13	Kittiwake Trust and Borderline Books	Gateshead	Community resource (library)	Targeted support
Contributions outside of the workshop				
INT12	Greening Wingrove	Newcastle upon Tyne	Community development; Action group	Influencing action
INT7	Chilli Studios	Newcastle upon Tyne	Mental health support; Artistic intervention	Targeted support

6.6. Workshop promotional flyer

MAKING COMMUNITY:

Overcoming shared challenges with digital technology

An online workshop for community organisations hosted by Newcastle University

MONDAY 12th JULY 2-4PM

About the workshop:

This online workshop is for North East organisations who are responsible for managing shared resources with and for their communities.

Anyone can get involved, whether providing physical spaces, facilitating digital connections or offering vital support to those in need.

What will this workshop involve?

In the workshop, we'll invite you to take part in some activities to reflect on the opportunities and challenges you face in supporting communities.

We'll ask you about why and how you do the work you do. We'll also discuss how we might be able to overcome the challenges you share in doing your work.

The activities will focus on the role that digital technology can play in your work, and how technologies could be designed better for you and those you support.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 822766

openlab gE.CO

What will I get out of it?

- An opportunity to share challenges and reflect on your daily work alongside other North East community organisations.
- A chance to make connections with like-minded colleagues and continue the discussions after the workshop and beyond.
- A local shopping voucher in recognition of your valuable time and contributions.

What else do I need to know?

- The workshop will be held on Zoom and recorded with your explicit consent.
- The workshop forms part of research being led by Sean Peacock (sean.peacock@newcastle.ac.uk), a researcher from Open Lab at Newcastle University.
- It builds on virtual interviews conducted with North East organisations between April and June 2021. You do not need to have taken part in an interview to come to this workshop.
- This research forms part of the gE.CO Living Lab project, a three-year research project supported by the European Union.

To register for the workshop, please visit:
https://bit.ly/3wRDE80

6.7. Presentation to the gE.CO consortium in Zaragoza, 21/9/21

UNEW UPDATE ON DELIVERABLE 5.1

Tuesday 21st September 2021 in Zaragoza, ES

Sean Peacock
Vasilis Vlachokyriakos
Clara Crivellaro
Rob Anderson

PRESENTATION SUMMARY

1. Our approach
2. The gE.CO toolbox
3. Usability analysis
4. Community research – methods and findings
5. Implications and recommendations
6. Next steps

OUR APPROACH

Deliverable 5.1: 'Increasing accessibility of ICT tools'

What does it mean to have 'access' to a digital tool?

The question goes broader than just being able to use the digital tools, or having it available

We align with Ribot and Peluso's definition of access as:

'the ability to benefit from things—including material objects, persons, institutions, and symbols'

Rethinking access as a "bundle of powers": what are the social, political and economic contexts shaping people's abilities to benefit?

INTERPRETATION OF ACCESS

Having the right to benefit to isn't enough. We think it's also a question of ability, capability, inclusivity and power

Research into accessibility of ICT tools often takes this focus too

This is valuable, but it does not get to the heart of how ICT tools could be taken up for generating commons

We wondered: how can commons groups take these digital tools and derive benefits from them?

Inspired by work by Coles-Kemp and others, who note:

'digital literacy and access to technology are not the only resources and capabilities needed to successfully access digital services'

Ribot and Peluso 2003

GE.CO TOOLBOX: USABILITY ANALYSIS

How does the gE.CO toolbox work in practice?

GE.CO TOOLBOX

Six fully functional tools:

- Nextcloud (Drive, Talk, Forms, Calendar) – enhanced with Collabora
- Mattermost
- Cryptpad

Documentation for all of these services now online

Can now also request a service to add to the toolbox

Extract from the documentation

Nextcloud Drive (left)

Collabora integration in Nextcloud (below)

Mattermost

Cryptpad

ANALYSING THE USABILITY OF THE GE.CO TOOLBOX

Wanted to understand how the tools worked in practice

Conducted tests of the tools following best practice (Barnum / Nielsen) and adopting two personas (Alicia and Bettina)

Ran these tests and recorded first impressions, user journey and positive and negative attributes of the system

Worked with our developer (Rob) to identify and address issues that are in scope for us to fix

Mattermost

	Issue	Functionality it affects	How to fix it	Resolution
	Video introducing Mattermost introduces CryptPad instead	May cause confusion among users of the toolkit	Move video to the Cryptpad box. Consider making a separate video to introduce users to Mattermost	JP emailed Yilmaz 5/5/21 (suggest we take down video for now.)
	Names and emails of everyone who has signed up to the Mattermost service is visible when sending Direct Messages, even if they are not members of the team	Privacy – users aren't notified their emails will be shared in this way, and upon realising may feel uncomfortable. Users should not be able to DM people if they are not members of the team	Concealing emails and names would address the issue.	RA: You should only be able to direct message people in the same team now
	No clear way to switch between teams, and switch channels button could be confused for switching teams	This could confuse people trying to switch between different teams (in comparison to Slack, which makes it easy to do this). Switch channels functionality could be improved.	Change the switch channels button, which is redundant, to a switch teams button. Provide on screen dialogs or describe in the tutorial how to switch between teams easily. Consider explaining this in the documentation too.	RA: Once you get on multiple teams an extra sidebar appears which lets you switch quickly. Joining another team isn't as simple as it could be, you have to click on your current team then "Join another team"
	Cannot create a new account if the email has already been registered before	Not significant, but it may confuse people or discourage them from creating a new team.	Consider if there is a way of users being able to create an account (e.g. to create a standalone team). Note this as a limitation in documentation	RA: You log in the documentation and clearly that one account can be in multiple teams.

Extract from the table of recommendations we produced following our usability testing

SOME IMPROVEMENTS FROM OUR TESTING

Tweaked privacy settings in Nextcloud and Mattermost so users don't show up for everyone

Reviewed different features and how they work so we can describe them accurately to others

Introduction of Collabora to address limitations in document creation

Reviewed storage space issue

Identified omissions in documentation

We have also made recommendations for the open source community, which will be presented later in this presentation

DIGGING DEEPER: COMMUNITY RESEARCH

Collaborating with local initiatives to better understand access

DESIGNING OUR COMMUNITY RESEARCH

If we see access in the context of the commons in a richer way, we needed to dig deeper

What does access to ICT tools mean for commons organisations and projects like gE.CO?

What is the role of tech to enable groups to manage access and govern their resources?

What kinds of benefits do they seek? What opportunities and limitations do they face?

DESIGNING OUR COMMUNITY RESEARCH

Conducted empirical research in the context of North East England. These findings can add to the rich insights gathered by other partners.

Our research questions:

1. What are some of the practices and outputs of organisations supporting the creation of commons, and how are they currently using digital technologies in their work?
2. How can we design digital technologies to sustain these existing commoning practices and support the generative production of commons?

METHODS

We contacted local groups who are co-creating, sharing and sustaining collective resources in their community

Ended up with lots of different groups: community centres, gardens, artists studios, action groups, property developers, co-housing schemes, mental health support and an events space

15x semi-structured interviews – one on one, conducted over Zoom or telephone call

Asked questions about projects, governance, role, approach to work, values / impact, COVID-19 and use of tech

The Miro board we used during the workshop

METHODS

Invite to a follow up workshop (5 attended)

Explore benefits, opportunities, challenges and the potential for tech

Post it note activity: what, who, how and motivations

Then pick from 5 prompts to discuss (e.g. workarounds, trade offs, tech support)

Finally, prioritise three things to focus on

Left the Miro board open for participation after the workshop

Workshop flyer

Preliminary data analysis on Miro

THEME 1: STEWARDSHIP AND CARE IS CENTRAL TO OUR WORK

Material resources are very important to us, but we face tensions in enabling access to everyone in the community

COVID-19 has led to us losing access to resources, e.g. physical space

Digital has plugged the gap, but it has also exposed the extent of digital exclusion

> *"[Our common resources are] trust based, it's not a free for all, it's not like a Wild West… in order for this to be maintained as a common house, there's got to be there's got to be a kind of fairly tightly, collectively governed sort of stewardship. So, it's not, we don't want the tragedy of the commons, we don't want this coming in and destroying it."*

THEME 2: MAKING THINGS WORK WITH WHAT WE HAVE

Managing financial and time-based constraints – e.g. we can't offer people the digital skills to bridge the gap

This limits the potential access and take up of tech – we need time and space to explore possibilities

We need support and solidarity to understand how to overcome these challenges

> *"Funders expect us to turn up and say, this is what we're gonna do, this is how we're going to do it, this is what your outcomes are going to be. So, to say, what is the potential of technology? We have no idea. We can't fund that. So, yeah, we need some mechanism by which we can have a little bit of breathing room to explore potential."*

THEME 3: WE NEED TECHNOLOGIES THAT BETTER REFLECT OUR VALUES

We have strong values that we express through our work – why does technology not reflect these?

Limited control over proprietary technologies – we trade off our ethical concerns for greater familiarity and reach

Ethical alternatives are great, but we can't always trust these, and we have to trade off usability

> *"Facebook and Google have just developed so effectively [and] made themselves indispensable… people coming in [to our collective] who've not had that experience of belligerently sticking with slightly less beautiful and streamlined bits of software, they're like, 'Why can't we just use Google? It's really easy and convenient and everyone knows how to use it'… you're only preaching to the converted if you decide to only promote using other channels."*

IMPLICATIONS AND RECOMMENDATIONS

Summarising implications, recommendations and next steps

RECOMMENDATIONS FOR THE OPEN SOURCE COMMUNITY

Nextcloud: Address user experience issues e.g. notifications, file expirations, deleting items, duplicate options in Forms, time zone/attachment issue in Calendar

Mattermost: Replace incorrect intro video in toolbox

Cryptpad: Note/address limitations in the interface e.g. working logged out, importing and exporting files, interoperability, polling tool, donations to support the tool

SUGGESTED IMPLICATIONS FROM THE RESEARCH

Value of material resources and the tensions surrounding access – digital spaces do not simply fix this

Digital exclusion – multiple dimensions of this, particularly following COVID-19

Groups need time and space to explore possibilities of tech – can't just give them new tools

Feeling of a loss of *ethical* control when using proprietary platforms – inability to govern them and ensure they align with their values

However, unfamiliarity of open-source tools hampering their take-up. How do we begin to overcome this?

RECOMMENDATIONS 1: TECHNOLOGY DESIGN

Can't assume that urban commons groups prefer digital tools that embody similar values

Digital technologies are tools to achieve other practices and goals, and we shouldn't assume that open source is always the answer

Proprietary technologies may be aligned with their values in other ways, e.g. being more convenient or familiar to a broader range of people

By making the values embodied in systems more transparent and visible, organisations can make more informed decisions about which systems to use and why, e.g. using WhatsApp alongside Nextcloud Drive.

This could also reveal how groups can take control of technologies for what matters to them, e.g. combining open and closed source, and using existing tech to do different things

RECOMMENDATIONS 2: RESEARCH AND COLLABORATION

Not just about granting access to tools, but researchers can also help build longer term relations with organisations with similar values that can sustain and develop these tools

This involves creating the conditions for partnerships, so that technical systems can be configured and maintained with the values of commons organisations in mind

Providing funding to community groups could form part of this collaboration – what might we find out if community groups explored digital tools (among other things) for themselves?

Reflect on our role as partners with community groups and how we can better support them to overcome challenges and explore possibilities, e.g. sharing material resources

Moving beyond the extractive nature of research to deepen impact

SUMMARY AND NEXT STEPS

1 October: Sending draft deliverable to partners for review

October: Community report circulated to interviewees and other local groups for feedback

Later this Autumn: Follow up workshop planned to discuss commons technologies in more detail

Until the end of the project: Supporting the gE.CO digital toolbox and ensuring they remain secure and up to date

THANKS FOR READING

Questions or comments: Vasilis.Vlachokyriakos1@newcastle.ac.uk

Sean Peacock
Vasilis Vlachokyriakos
Clara Crivellaro
Rob Anderson