

# **Entrepreneurial Collective Intelligence**

## **Working paper including Case Studies**

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### **Abstract**

The purpose of this Working Paper is to provide a single point of reference for a set of case studies which were researched and written during 2021-23 to inform conference and journal papers on the new concept of Entrepreneurial Collective Intelligence (ECI). The cases themselves were too long in total to be included in full in these publications. Also, the cases may be of value separately for research, demonstration and educational purposes.

Based on insights from the case studies, a conceptualisation identifies four categories of collaborative structures and collective work processes which characterise ECI in the organisations studied, as well as more generally. These include: Collaborative processes; distributed working; intelligence availability, and organisation of infrastructures.

Keywords: entrepreneurial processes, entrepreneurial collectives, collective intelligence, entrepreneurial learning, collective agency

### **Introduction**

The interest in the role of collective entrepreneurship in communities is growing (e.g. Montgomery et al, 2012). This is partly due to an increased use of information and communication technologies in enabling and organising collective knowledge and action, recently accentuated by a focus on Artificial Intelligence (Leong et al, 2020). These developments influence how entrepreneurial collectives develop and organise themselves, and how they access, share, and use knowledge resources. Whilst there is prior research in these areas, there is still a need for empirical knowledge and conceptual development on the phenomenon of ‘Entrepreneurial Collective Intelligence’. Hence, the ambition of this research process is to improve our understanding of how entrepreneurial communities learn to act collectively and knowingly?

We proposed this overall research question: how can collective intelligence, collective agency and collective action together provide an explanation of the processes taking place in entrepreneurial communities? Our papers contribute by studying relationships between the collective processes of agency, intelligence and action and exploring explanations of how entrepreneurial communities are established, developed and maintained.

In undertaking this enquiry as a collaborative research project during 2021-23, we identified a series of cases, researched them, and wrote up a set of case studies to inform a series of conference and journal papers on the new concept of Entrepreneurial Collective Intelligence

(ECI). By ‘series’ this was an iterative process of developing our thinking, exploring and summarising prior works, investigating empirical sources, and conceptualising our findings. This process reached a conclusion with the acceptance of our 2023 paper for publication in *Journal of Enterprising Communities*. The purpose of this Working Paper is to provide a single point of reference for the cases which were too long in total to be included in full in these publications. Also, we wish to make the cases available separately for research, demonstration and educational purposes. Based on insights from the case studies, a conceptualisation identifies four categories of work themes or processes which characterise ECI in the organisations studied, as well as more generally. These include: Collaborative processes; distributed working; intelligence availability, and organisation of infrastructures.

Definitions are important and vary between contexts of study and theoretical approaches. Hence we include here the working definitions used in this paper. Collective Intelligence (CI) was defined in broad terms by Atlee & Por (2007) as: *“any intelligence that arises from - or is a capacity or characteristic of - groups and other collective living systems”*. Hence, Entrepreneurial Collective Intelligence is proposed as: *“intelligence arising from the interactions between entrepreneurial groups and systems for collective meaning-making, including education and learning”*. Collective Action is defined here (from several definitions) as: *“actions decided and taken together by a group of people who have a common objective”*. Collective Agency is defined as: *“the social coordination and interdependence of effort in individuals and groups to produce outcomes”* (Bandura, 2000). Together these definitions form the set of conceptual building blocks for the analysis in our work.

### **Conceptualising Entrepreneurial Collectives**

The notion of ‘Collective Entrepreneurship’ is not new and has been current for almost 30 years, amassing a significant body of work whilst lacking a unifying definition (Johanisson, 1994). However, the term ‘Entrepreneurial Collective Intelligence’ is new, and the association between Collective Intelligence and Entrepreneurship in research in any form is itself recent (eg Mignenan, 2021). To perform our analysis we broke down the concept of Entrepreneurial Collectives into meaningful analytical elements, to identify how we can gain insight into each of these elements. Our analytical framework proposes that collective entrepreneurial action arises from interactions between collective intelligence and collective agency. A simple initial conceptualisation of these ‘Entrepreneurial Collectives’ and its constituents is included as Figure 1. This is developed subsequently in our work as Figure 3.

Our thesis is that, in relation to entrepreneurship, Collective Action is interconnected with and informed by both Collective Agency and Collective Intelligence. Working within a contextual and conceptual frame of entrepreneurial collectivism, action alone is insufficient. Agency provides the strategic direction and Intelligence provides the evidence, analysis and distributed knowledge through which Action can be optimised. Effective action consequently informs and reinforces the nexus between Agency, Acting and Intelligence. Collective Action alone may be a misnomer in that the most effective action is rich in both agency and intelligence, but it has not generally been described as such.

The reviews of prior work and their analysis in leading to this conclusion are included in our earlier and published papers (Rae & Blenker 2022, 2023). The detailed methodological and conceptual discussions will also be found there.

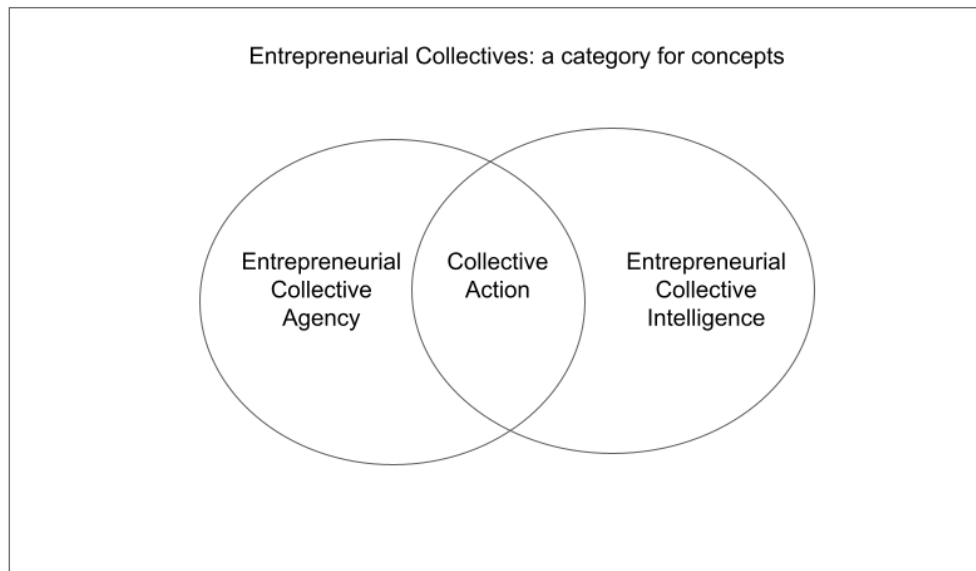


Figure 1: Simple conceptualisation of Entrepreneurial Collectives

**Methodological approach: case construction**

This section and the next which presents and then conceptualises from the cases, address the research question of where, and how entrepreneurial collectives demonstrating collective intelligence, action and agency can be studied? How do they work? A selection of cases is provided for interpretation and comparison, as examples to learn from, which offer useful and transferable insights.

We approached this through an iterative research approach of specifying what we mean by collective intelligence and entrepreneurial collectives, identifying examples of this kind of collectives, analysing their differences, constructing coherent cases that can represent a variety of this form of behaviour, and finally formulating general patterns and mechanisms from the cases. In reality the research process has been abductive. The inductive and deductive elements have been interwoven, as simultaneously we have been specifying theoretically, criticising, identifying empirically, constructing cases and formulating patterns (Gioia and Pitre 1990). To provide methodological clarity and transparency this abductive research process can be reconstructed into its deductive and inductive elements. The deductive elements is represented in Figure 2 by phase 1) to 2) and the inductive elements by phase 3) to 4)

**Deductive parts:** A theoretically informed search for examples

1. Searching for: Entrepreneurial Collective Intelligence in terms of:
  - entrepreneurial collectives
  - collective entrepreneurial action
  - collective agency
  - social knowledge
  - collective intelligence.
3. Resulting in 6 examples, 4 chosen for case description.
  - Wikipedia
  - Enterprise Educators UK
  - *The Entrepreneurs Network 'TEN case*
  - *Free beer/Superflex*
  - *Extinction Rebellion*
  - *OpenSource Software*

**Inductive parts:** An empirically based search for patterns in cases

4. Cases constructed in a structure of:
  - the history and background for the case
  - the problem the initiative seeks to address
  - the logic and function of the initiative
  - the CI elements of the initiative
  - the EC elements of the initiative
  - what the case says about ECI
  - what can be learned from the case.
4. Resulting in a conceptualization of four categories of entrepreneurial collective intelligence:
  - collaborative processes
  - distributed working
  - intelligence representations
  - infrastructures

Figure 2: Relationship between deductive and inductive parts of the research process

In the deductive parts we worked from our theoretical notion of 'Entrepreneurial Collective Intelligence' and related concepts of entrepreneurial collectives, collective entrepreneurial action, collective agency, social knowledge and collective intelligence. This may be labelled as "loose deduction" (Emigh 1997), as the theoretical background which has informed our search for examples that we would characterise as entrepreneurial, but not based on individual agency and private knowledge. Examples have thus been identified on a 'black swan' principle of falsifiability (Popper, 1959). In Popper's metaphor the white swans can be seen as the established views on individual agency and private knowledge that dominate not only mainstream entrepreneurship theory, but also our classrooms. In our search for examples we therefore deliberately looked for black swan examples. This search has been broad, trying to identify examples with a focus on creating collective intelligence, building social knowledge or information sharing; others with focus on collective action and agency; and some that combine the collective knowledge and agency dimensions. A large number of examples were identified, and a few selected for case construction.

In the inductive parts we constructed a heterogeneity of cases where we could search for patterns (Eisenhardt and Graebner 2007) in their social constructions of knowledge and intelligence; and socially based forms of entrepreneurial action and agency. These cases have been constructed on the basis of publicly available information, including knowledge from encyclopaedias such as Wikipedia; general information from case homepages; direct research; and personal experiences. The cases are constructed into a narrative and made comparable by using the same headings in the narration of each case: 1) The history and background for the case; 2) the problem the initiative seeks to address; 3) the logic and function of the initiative; 4) the CI elements of the initiative; 5) the EC elements of the initiative 6) what the case says about ECI; 7) what can be learned from the case.

The selection of cases further represents an intentional search for heterogeneity. As demonstrated in figure 2, we have searched both for cases that represent collective intelligence or collective agency, and for cases that combine both logics into full entrepreneurial collective intelligence. Also, the types of organisation are all different and represent different ‘archetypes’.

*Focus on collective intelligence*

Wikipedia - a collective construction of shared knowledge

The Entrepreneurs Network ‘TEN’ case - a policy organisation

Free Beer/Superflex - an art group

Extinction Rebellion - a political movement

OpenSource Software - a network

Enterprise Educators UK – an institutional membership organisation

*Private Knowledge*

Traditional conception

*Individual agency*

*Focus on collective agency*

Figure 3. Overview of Constructed Cases

The cases both illustrate and elaborate on our arguments above. The cases are examples of entrepreneurial agency and all demonstrate voluntaristic behaviour where individuals formed collectives which became changemaking organisations or movements. The collectives described in the cases perform innovative functions in society where they revolutionise central patterns of operation through innovative new ways of producing knowledge, organising knowledge or producing politics. Further, the cases represent entrepreneurship as the formation of organisations (Gartner, 1988), although these organisations take on many other forms than a new firm, for example a policy institution, art group, political movement and a network. The

cases are ‘black swans’ as their entrepreneurial action is not individual and the knowledge they rely on is not private, but is establishing foundations for collective agency, social learning processes, collaboration and open, freely shared resources. Our aim is to show how collective agency and collective knowledge can manifest valuable, innovative and alternative forms of entrepreneurship.

## The cases

In the following section we present each of these cases. The first four cases: Open Source Software”, Free Beer by Superflex, Extinction Rebellion and TEN: The Entrepreneurs Network has been presented in condensed form, but analysed more thoroughly, in our 2023 paper for Journal of Enterprising Communities (Rae & Blenker, 2023). The two last cases on Wikipedia and Enterprise Educators UK (EEUK) were prepared early in the research process and published in a conference paper for the 3E conference in May 2022 (Rae & Blenker, 2022).

The six case organisations each illustrate unusual forms of collective organising, including the purpose of sharing intelligence. They are also examples of intelligence-based entrepreneurship, and are presented in a developmental sequence from the ‘user-generated content’ of Open Source Software to more radical, complex and multi-dimensional communities.

### *Open Source Software*

This case addresses the Entrepreneurial Collective Intelligence found in *Open Source Software* (OSS) development<sup>1</sup>, and provides a combined focus on CI and EC. Historically computer software developers shared code and software when production was mainly for academic and governmental organisations. The rise of proprietary and corporate software firms exploited the commercial imperative to protect intellectual property and extract revenues, which marginalised this culture of sharing, but did not end it.<sup>2</sup> Free and Open Source Software has become too successful, innovative and useful to be ended by corporate interests, and the switch by Microsoft from seeing OSS as an existential threat in 2001 to acquiring and commercialising GitHub marked recognition of the value of co-existence and plurality between free and paid-for models.

OSS enables software developers to share code freely and safely. This saves resources by reducing the need for codes providing known functionality and reduces duplication, whilst enabling testing, fault resolution and learning to take place quickly. It helps individual developers overcome isolation, access advice and learning, and to find collaborators on projects. OSS has become an industry in its own right with a well-developed and mature, yet continually evolving ecosystem. Collective agency is established through a ‘bazaar’ model for software development based on users as co-developers, within a set of principles. OSS is developed by using modules and code which can incorporate existing code accessed from open-source-code libraries or repositories including Launchpad, GitHub, GitLab, and SourceForge. This code can be adapted, rewritten, replaced and added to for additional functionalities.

The collective is a heterogeneous network of coders, software developers, experts and consultants, system architecture designers and specifiers, problem solvers and software quality assurance. The collective intelligence base includes the code and modules which have been written; and a range of educational and training, advisory, design, quality assurance, standardisation and application knowledge and materials. In this way an entrepreneurial

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<sup>1</sup> <https://opensource.com/>

<sup>2</sup> [https://en.wikipedia.org/wiki/Open-source\\_software](https://en.wikipedia.org/wiki/Open-source_software)

organisation has been established as an ecosystem of membership, repository, foundations curating software platforms, distributors and publishers. This is supported by usage, copyright and licensing models which enable value to be captured by developers, publishers or distributors.

The Entrepreneurial Collective dimension lies in the capabilities within the OSS sector to innovate, to create and capture value, to produce widely adopted software products, and to grow sustainable incomes and business models for individuals, project collaborations and organisations. OSS provides an ecosystem within which software developers, innovators and others can interact in both entrepreneurial and open-collective ways for shared and general benefits. Its annual value is difficult to estimate, but the jobs created and maintained amount to a global industry<sup>3 4</sup>.

Viewing OSS as a system of entrepreneurial collective agency, it provides a learning environment within which practitioners can develop their skills, find collaborative partners, access the best available OSS, and work together on projects. However it is probably necessary to focus on selected communities and organisations, such as Red Hat, to understand the entrepreneurial collective intelligence characteristics of the sector. The learning and information-sharing for OSS are distributed as digital resources and facilitated via social interaction media such as forums, chats, Wikis and threads, so to that extent learning is embodied within the collective resources and infrastructures.

### *Free Beer by Superflex*

Superflex was established in 1993 by three Danish artists as an art group and since developed into an expanded international collective working with a wide variety of collaborators and projects.

The ambition was not only to make art for exhibition, but also to take art outside the exhibitions and work with “structures of power, ownership, collective action, environmental challenges and interspecies relations”<sup>5</sup>. Some of their works only occur during an exhibition, while others evolved over years. These latter projects involve participation, local communities and specialists such as designers, businesses and marketing agencies<sup>6</sup>, with the ambition to engage with systems in order to challenge them<sup>7</sup>, through “counter-economic” solutions experimenting with alternative means of production<sup>8</sup>. There have been many projects since 1993, such as the “Guaraná Power” project engaged with a collective of farmers in Brazil to produce and market a cola drink that could challenge the dominance of a multinational soda company’s market dominance in the area. In the following we focus on just one of their projects: Free Beer.

The Free Beer was first formulated in 2005 in Danish as “Vores Øl” (directly translated into Our Beer), reusing a slogan used by Carlsberg in the beginning of the 1990’s. The Danish Beer market was in this period close to a monopoly with many secrets on how to produce quality beer, and with Carlsberg as the main actor. Together with students from the Danish IT-University and craft beer professionals, Superflex began publishing open-source beer recipes under the creative commons licence. The aim was simply to cross-appropriate the practice of

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<sup>3</sup> <https://github.com/>

<sup>4</sup> <https://www.redhat.com/en/resources/state-of-enterprise-open-source-report-2022>

<sup>5</sup> <https://artsandculture.google.com/story/>

<sup>6</sup> <https://superflex.net/about>

<sup>7</sup> <https://www.nytimes.com/2019/02/07/arts/superflex-desert-x>

<sup>8</sup> <https://kadist.org/work/guarana-power-commercials/>

Free Open Software to a non-digital field. Beer recipes were now free open software and could be further developed without restrictions. The dominating secretive behaviour in the industry was challenged by collective action. The beer was Free - not in the sense that it had no cost to produce and buy; but Free in the same meaning as “Free Speech”, and liberated or emancipated from closed forms of monopoly through Collective Intelligence.

The free beer recipe has, like open computer software, been updated. Bugs have been fixed and patches made by commercial breweries and individual enthusiasts worldwide, and in 2017 Free Beer reached version 6.0.<sup>9</sup> Free beer opened an opportunity for small actors in the beer industry to act as an entrepreneurial collective. In the period when the Free Beer initiative was very active there was a high growth of craft and microbreweries. Culturally, artisan and microbrewers often co-operate and help each other rather than competing. Of course, the Free beer initiative can only account for a small part of this correlation.

### *Extinction Rebellion<sup>10</sup>*

Extinction Rebellion was established in 2018 as a social and environmental movement in the UK, by 11 political activists with the purpose of avoiding social and ecological breakdown and mass extinction, as a consequence of climate change and biodiversity loss. Their argument is that political leaders around the world have failed to provide immediate and real political solutions to pressing global problems. The movement wants politicians and governments to accept the climate and ecological emergency documented by researchers and to take immediate action.<sup>11</sup>

The establishment of Extinction Rebellion is characterised by two parallel social movements. First, it relies on research-based insight by academics and experts who have shown that the globe is in a state of emergency and that the time for action is rapidly running out. Second, it builds on political experiences from previous activist groups such as Rising Up and the Occupy Movement, being organised as a loosely networked, decentralised, grassroots movement.<sup>12</sup>

The many autonomous geographically local groups agree on three core aims: that 1) governments must tell the truth, 2) act now, and 3) create and follow decisions of a citizens' assembly. There are ten general principles: related to future generations, creating momentum, regenerative culture, challenging ourselves, learning from the process, including new actors, reducing power distances, avoid blame and shame, non-violence, and de-central autonomy<sup>13</sup> Local groups can act under the Extinction Rebellion name as long as they pursue the three goals and live up to the ten principles.

Extinction Rebellion seeks to provide a disruptive and innovative (neo-Schumpeterian) solution to two profound problems in environmental policy. First, that the world's political system has failed to provide sufficient agency to bring about the necessary societal changes that can prevent ecological breakdown. Second, that our information streams and knowledge based on biodiversity and climate changes are strongly politicised to protect actors with strong economic interests in climate and environment issues to promote biased and even false information.

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<sup>9</sup> [https://en.wikipedia.org/wiki/Free\\_Beer](https://en.wikipedia.org/wiki/Free_Beer)

<sup>10</sup> For detailed academic case studies see: Fotaki & Foroughi (2021); Rhoden (2021)

<sup>11</sup> [https://en.wikipedia.org/wiki/Extinction\\_Rebellion](https://en.wikipedia.org/wiki/Extinction_Rebellion)

<sup>12</sup> <https://extinctionrebellion.uk/the-truth/faqs/#where-did-the-idea-come-from>

<sup>13</sup> <https://extinctionrebellion.uk/the-truth/about-us/>



The entrepreneurial solution initiated by Extinction Rebellion combines three components<sup>14</sup>. First, a particular approach to agency, using non-violent direct action and civil disobedience, typically performed by occupying, blockading, demonstrating or sit-downs in public in contrast with the established political system, polluters or symbolic events such as Black Friday. The groups seek to create mass civil resistance, accepting mass arrest and imprisonment as consequences of their activism. This agency is organised in small, autonomous groups around the world. It thus appears as a loosely-coupled do-it-together approach, composed of distributed, autonomous organisations, where coordination relies on digital connectivity and social media for organising and communicating (Fotaki & Foroughi, 2021).

Another component is their approach to knowledge, proposing that we should “listen to the scientists”. Science is *par excellence* a collective intelligence system, where communities of researchers collectively build knowledge through generations. This includes studies of climate change, where a consensus has been built among scientists that climate changes are real and the human cause exists. Although the relationship between science and activism has been seen before, science may also be understood as taking place in an apolitical ivory tower. A large number of scientists are frustrated by the lack of political urgency on climate change. The idea behind Extinction Rebellion's “Tell the Truth” principle is to amplify the communication efforts of existing science (Rhoden, 2021). For scientists this raised questions on if and how they could relate more actively to policy and the democratic process, through increased interactions between activists, research communicators, and scientists. Related groups such as “Scientists for Extinction Rebellion” and “XR Educators” have been established. The final emphasis is on collective reflecting and learning, where Extinction Rebellion claim to follow “a cycle of action, reflection, learning, and planning for more action”<sup>15</sup> This represents a classic experience-based learning approach, found in most forms of entrepreneurial learning, where strategies and self-transformation of the movement are emergent, so the organisation continuously challenges and learns from its activities, beliefs and meanings.

The Extinction Rebellion case encompasses an element of collective intelligence in terms of the strong emphasis on collective scientific knowledge, but it especially contributes to understanding the entrepreneurial collective element of generating new forms of decentralised social actions. The case adds to our understanding by Entrepreneurial Collective Intelligence through the importance of collective yet distributed learning

*TEN: The Entrepreneurs Network (UK)*<sup>16</sup>

There is a long-standing divide between Government intentions to consult entrepreneurs in policy-making and effective mutual understanding and interaction in this process. TEN was formed in 2014, as ‘a think tank for Britain’s most ambitious entrepreneurs’, to represent entrepreneurs and use them to inform public entrepreneurship policy, by commissioning or conducting research studies, hosting entrepreneur-policy exchange meetings, sharing information and attracting media attention to entrepreneurship policy.

The ambition behind establishing TEN was to ensure a consistent and well-informed entrepreneurial voice for policymakers, supported by an experienced facilitator, Philip Salter. ‘TEN is a think tank for the ambitious owners of Britain’s fastest growing businesses and aspirational entrepreneurs. Through research, events and the media, it bridges the gap between

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<sup>14</sup> Extinction Rebellion: Last Chance to save the World? (2019)  
<https://www.bbc.co.uk/programmes/p07fvjfs>

<sup>15</sup> Principle 5, see <https://extinctionrebellion.uk/the-truth/about-us>

<sup>16</sup> <https://www.tenentrepreneurs.org/>

entrepreneurs and policymakers to help make Britain the best place in the world to start and grow a business'. TEN seeks to promote a pro-business and entrepreneur-friendly economy and policy environment. To achieve this, TEN is politically well-connected and provides the secretariat for the All Party Parliamentary Group for Entrepreneurship, with a membership of 10 MPs and 8 Peers, set up to encourage, support and promote entrepreneurship<sup>17</sup>.

The initiative represents an entrepreneurial initiative to form a new organisation; in this case not a new firm, but a policy organisation, based on collective agency. There is a core of six named people with functional responsibilities for running TEN, led by Salter. These are mainly young, high achievers, with a shared commitment to female entrepreneurship and inclusion. There are two Patrons from investing organisations, and a group of 52 Advisors, mostly founders or senior executives from entrepreneurial businesses, chosen for their expertise and alignment. Finally there are nine Research Advisors drawn from academic, business and policy research backgrounds. The TEN collective also includes the APPG membership in Parliament. TEN positions itself as 'a think tank' based on sharing intelligence collectively. The APPG has 12 policy priorities concerned with open and inclusive access to entrepreneurship; enhancing investment and productivity; and reducing barriers to business growth. These broadly match the range of project and interest areas identified by TEN, and their research agenda. A series of research reports have been completed and published since 2019, including startup policies; financing growth; entrepreneurship education for future founders; digital adoption and AI innovation; resilience and recovery from COVID; barriers to business creation in deprived areas; female founders; and a critique of government policies on the 'sharing economy'. A Small Business Forum and other groups also contribute to the research. Reports are shared with the APPG and also publicised through thematic events. There is a regularly updated Blog, a weekly e-newsletter, and member forums for female founders and inclusive innovation. Westminster media outlets are briefed and influential policy and business contacts informed. There is a growing body of publicly available and credible research and policy briefings.

TEN is an interesting example of ECI, since it has created its own collectives in order to meet a perceived business-policy gap. Arguably, it serves to further the economic and political ideologies of its founders and participants – pro-business, free-market and capitalism, and does so quite effectively. How far its influence resonates beyond the 'Westminster bubble' of government and 'policy wonks' is not known, but by articulating a consistent and well-evidenced stream of research thinking within a noisy environment of policy and lobbying groups, it has been relatively successful in gaining the ear of government, and feeding suggestions into business policy. There may be questions about how diverse, how balanced and representative it is. Conversely, it is a collective likely to welcome younger, minority and new entrepreneurial voices.

### *Wikipedia*

Encyclopaedias, providing an overview of knowledge either generally or within a particular field have existed for hundreds of years. Historically these have been edited and written by established experts, with Diderot's Encyclopédie from 1751 - 1772, in French being the first well known general encyclopaedia. The Encyclopédie, edited by Diderot, but co-produced by 150 other intellectuals, was as part of The Age of Enlightenment in itself an early attempt to establish collective intelligence. Diderot's example was followed by many other well known encyclopaedias like Encyclopædia Britannica, published now for around 250 years. This method of production for encyclopaedias, with few editors controlling the quality of articles

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<sup>17</sup> <https://appgentrepreneurship.org/>

produced by many authors, was fundamentally unchanged until the establishment of Wikipedia in 2001.

Wikipedia introduced a new form of production for encyclopaedias, where free and relatively trustworthy content was produced and maintained by an open community of authors through open digital collaboration, making Wikipedia today's largest encyclopaedia in terms of content, authors and readers. Wikipedia is non-profit funded by donations, it is a Wiki, in the sense that it is produced through an open structure where anyone can edit its content. In practice this is performed by a large community of voluntary editors and authors, producing articles that are not owned by its authors or editors.

Already traditional encyclopaedias had elements of collective intelligence and democratisation of knowledge, but only on the consumption side, as content was produced (collectively) by an elite of editors and authors to enlighten the masses. Wikipedia changes the production structure of enlightenment as it invites anyone into an open structure of production of collective intelligence.

### *Entrepreneurship Educators UK*

There are diverse Entrepreneurial development organisations and communities of practice, including organisations and collectives in the 'entrepreneurial ecosystem' at city/region/national or international levels, research oriented organisations of long standing including ICSB, ECSB, ISBE, or with a focus on empirical collaboration such as GEM, but there are also organisations initiated by multiple actors and led in entrepreneurial ways. Entrepreneurship Educators UK is such an initiative and selected as a single representative case<sup>18</sup>.

The original problem which led to its formation was that insufficient or inadequate educator development in entrepreneurship was available at institutional, sectoral and subject levels to support the aspirations for widespread EE. This perceived need remains for access to continuing education and professional development for educators and enterprise developers in HE. A first initiative was made in 2001 and established as UK Science Enterprise Centres (UKSEC). The catalyst was Science Enterprise Challenge (SEC) and funding was provided by the UK Department for Trade and Industry (DTI) to establish 13 Enterprise Centres and consortia. Innovation in service provision and disciplinary areas beyond science and technology was attracting attention and universities broadened their enterprise and entrepreneurship education both across disciplines and beyond the curriculum into extra-curricular activities such as student enterprise clubs and societies.

UKSEC responded by widening its focus to disciplines beyond science and technology, and in this process it also became a membership organisation run by the members for the members. As funding ended the organisers recognised a wider opportunity beyond the initial consortia, to advance entrepreneurship education across the HEI sector through educator and practitioner development. A new constitution and paid institutional membership model was adopted, followed by a name change to Enterprise Educators UK (EEUK) and incorporation as an independent not-for-profit company limited by guarantee. The rationale for the revised organisation was to develop 'what works' entrepreneurship education development applicable

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<sup>18</sup> <https://www.enterprise.ac.uk/>

across all subject areas and HE levels, and realising this by being an educational practitioner network working as a forum for exchange of pedagogy and practice.

As an independent non profit and non public organisation, EEUK is member led and owned. The organisational model developed includes: University/HEI institutional membership covering all staff (as EEUK Associates) enabling free or discounted access to activities; annual conference (IEEC), practitioner development events, fellowships, a professional accreditation programme and engagement with EE policy, practice and research. The organisational structure is supported through independent self-employed contractors who run the organisation, organise events and ensure network and service delivery. The organisational model has endured for 15 years, demonstrating the sustainability of an independent and collective business model.

The EEUK initiative incorporates a number of CI elements. Information and knowledge is co-constructed by a variety of entrepreneurship educators across all subject areas, and many different kinds of actors, such as enterprise developers (eg in Careers & employability, startup & incubation, student enterprise support), university policy leaders, but also businesses (entrepreneurs) providing related EE services can join the initiative.

This variety of actors together provides an intelligence base of codified knowledge. An accreditation framework extends the EE ‘body of knowledge’ and shared knowledge systems have been established. Examples of these are the ‘ETC Toolkit’ of teaching resources, the ‘Ented Online’ resource for use in COVID lockdown, several policy reports and an annual competitive funding awards for member-led research & innovation projects (Enterprise Education and Research Project Fund). Knowledge is further distributed and shared via an Annual International Entrepreneurship Education Conference, Practitioner Development Workshops, parther events, and a number of online resources

EEUK not only spans the higher education entrepreneurship space and connects this as a entrepreneurial community, it also aims to span boundaries with policy and engage with startup communities and student enterprise organisations through. EEUK is oriented more towards EE than towards entrepreneurs but business engagement also takes place at member level. EEUK has become adventurous, able to respond with agility and innovative. Not all initiatives are durable and successful - such as aiming to support EE in Further Education and extend globally, so there is a willingness to experiment and fail in limited ways.

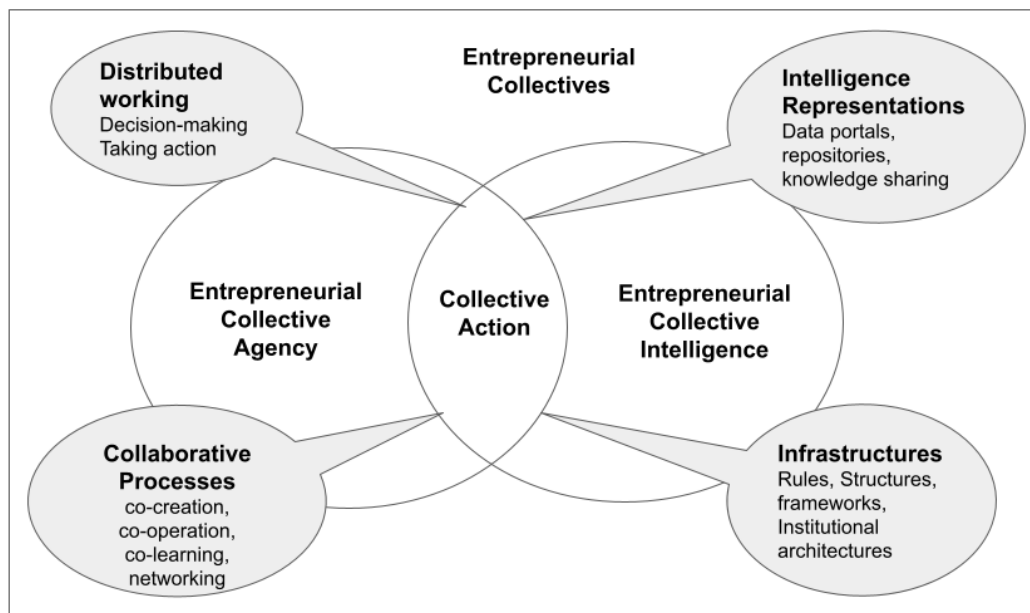
The organisation is clearly an entrepreneurial collective with a high level of shared knowledge. The knowledge base may be rather ‘lean’, and it can be discussed how deep the base of research and practice which is shared at conferences and events is, and how well it is subsequently made available and used? Also, how wide is the engagement with Open data and educational resources? EEUK presents a knowledge network for ECI, through which pragmatic and systemic approaches for learning and skills development can be shared and critiqued for practitioner engagement and value.

### **Conceptualising from the cases**

When analysing how our specific cases of collective entrepreneurship are able to establish collective agency, we refer to Mulgan’s (2018) suggestion to focus on how their mode of organising relates to continuous learning, arguing that “Making the most of these capabilities and infrastructures depends on *models of organization* that assemble capabilities and infrastructures in ways that allow for continuous learning. The most successful ones have five

characteristics: they create autonomous knowledge and informational commons, achieve an appropriate balance between their functional capabilities, achieve focus, orchestrate systematic reflection, and integrate for action” (Mulgan: 237).

Mulgan’s proposition for CI in organisations in general offers a multilayered conceptualisation, and much of it is relevant to understanding more specifically the working of collective entrepreneurial forms. Within the six constructed cases, both processes of collective organising and infrastructures for sharing and using collective intelligence can be identified. Within the collective entrepreneurship cases, there are structuring devices and frameworks such as rules, data repositories and portals, networks and institutional architectures. There are also enabling processes for intelligence-sharing, collaboration within and externally to the organisation; capacity for distributed and agile decision-making, innovating and deliberate focus on social and shared learning at multiple levels. It is difficult to generalise across these quite different types of collective entrepreneurship (policy organisation, art group, political movement, network, etc). However there are pronounced differences between these organisations which act using ECI (‘black swans’) and conventionally run non-ECI organisations (‘white swans’). We apply this conceptualisation in figure 4.



**Figure 4: Conceptualising features of Entrepreneurial Collectives (Rae & Blenker, 2023)**

Figure 4 synthesises the concepts and observations arising from the cases, by mapping onto the earlier conceptual framework for Entrepreneurial Collectives (figure 1) four features of ECs which were identified from the cases and which align with the ECI literature: collaborative processes; distributed working; intelligence and infrastructures. Each of these four categories represents a central area of attention for entrepreneurship, and for education, if we want to facilitate entrepreneurial learning processes which orientate learners towards using entrepreneurial collective intelligence. Each of these may be considered from several perspectives in order to address our research question.

We can identify phenomena from the analysis of the cases that represent these four features of EC. We see *collaborative processes* of co-creation, co-operation, co-learning, networking. In the Open Source Software Case through the ‘bazaar’ model where users co-develop within a

set of principles for developing, using, curating, copyrighting and licensing, providing a strong learning environment; in the Free Beer case where an art group, IT-students and microbreweries together create an intelligence system in order to liberate the beer industry; in the Extinction Rebellion case where a large number of autonomous loosely-coupled local groups through co-operation and co-ordination co-create an international political movement; and in the TEN case and the EEUK case we see successful entrepreneurs, policymakers and academics co-creating a collective system of co-learning in order to influence policy and enterprise education.

We also see the use of *intelligence representations*, in the form of shared data portals, knowledge repositories and media for knowledge sharing. This appear in the Wikipedia case and the Open Source Software case, but also in the Free Beer case where the creative commons licence is transferred to beer recipes among brewers; in the Extinction Rebellion case where insight from research and a general principles for action is shared on their homepage to form an ideological basis for movement, and social media used for organising and communicating between small, and autonomous groups; in the TEN case where shared research reports form the intellectual basis for a policy influencing structure of thematic events, blogs, e-newsletters and policy briefings.

Another aspect identified was the use of *distributed working* through collective decision-making and coordinated action. In the Open Source Software case coders, developers, experts, architecture designers and others were able to take action across traditional time and space limitations in open-collective ways. In the Free Beer case, the purpose of the Superflex art group is to work structures of power, ownership and collective action and the Free Beer project entrepreneurially created this within the beer industry. The Extinction Rebellion has an explicit focus on generating distributed and decentralised political actions where top-down coordination is replaced with digital connectivity and social media for organising. The TEN case appears to have a stronger division of labour where tasks are distributed between experienced entrepreneurs, academics, political influencers and advisors.

In all our cases we also find particular *infrastructures*, in terms of rules, structures, frameworks and institutional architectures that secure institutionalisation of collective intelligence and collective agency. The infrastructures are however quite different in the four cases. The central element of the EEUK case is membership, while the infrastructure in Extinction Rebellion appears to rely on rules, in terms of the three core aims and ten general principles rules; the TEN case has a quite traditional policy institution structure; whereas both the Free Beer and the Open Source Software case are built on more complicated infrastructures of rules for usage, copyright and licensing, frameworks for modules and code built into an institutional architectures that allows for open-collective problem-solving and development.

Taken together these collaborative processes, of distributed workforms, intelligence representations and infrastructures form systems of collective intelligence structures and collective agency processes which can enable collective forms of learning. Such learning essentially differs from most established approaches to entrepreneurial learning, where learning typically is seen as more individual and both less collaborative and distributed and less related to the interface between humans and intelligence representations and infrastructure.

Finally, we will make a brief reference to Ukraine before concluding this paper. In researching this topic, the initial backdrop was the descent into war with the invasion of Ukraine by Russia, and then the prolonged war itself up to the time of writing in July 2023. We make no moral or

political judgements, and even now it may be premature to make such observations. However, in the prelude to the conflict, there was extensive use and sharing of Open Source Intelligence (OSINT<sup>19</sup>), such as satellite data (including by the United States) showing the movements and clustering of Russian forces, this information was used (as intended) by Open Journalism correspondents to expose Russian military manoeuvres and strategic intent. Once the invasion commenced, it was quickly apparent that the intelligence, decision-making and resilience of the adversaries was very different. The numerically superior Russian forces had, in many cases, not been told what the battle-plan was, and lacked the capacity to respond to changing circumstances with resilience. They depended on centralised command-and-control with very limited local autonomy. Consequently, they absorbed severe losses of ground forces and their campaign only continued because of the capability to use missiles and long-range artillery to increase devastating remote attacks on Ukrainian towns and cities.

The Ukrainian government and military behaviour conversely indicated strong features of using Collective Intelligence. Their communications and media strategy was highly effective, whilst on the ground, they were militarily much more effective despite being outnumbered. They were able to anticipate and respond with agility to Russian movements and it was clear their capability to gather, interpret and use field intelligence as a distributed organisation was greatly superior, whilst remaining highly resilient in the face of hugely destructive attacks.

The journalist Luke Harding has worked extensively in Ukraine, before and during the conflict. In his book 'Invasion' (Harding, 2022:260), he observed at first hand why Ukrainians had an advantage denied to Russians, and in doing so underlined their collective intelligence, agency and action:

*"In the absence of social upheaval in Russia, it was down to Ukrainians to ensure the survival of their state. It wasn't an advanced American rocket system or a shoulder-carried missile; it was a mode of social organization. Russians were vertical in their thinking, always looking feudally upwards. Ukrainians were horizontal - a collective or super-organism. This millions-strong decentralized network was working tirelessly towards a shared and shimmering goal: victory".*

From this example, and also the Extinction Rebellion case, we can also see that whilst intelligence is shared quickly and effectively, there are also distinctions made about distinguishing openly shared information from intelligence which remains covertly distributed to selected agents within the organisations.

Within small entrepreneurial firms and community organisations, collective modes of shared-intelligence working appear increasingly normal, often learned through the distributed working practised during the Covid lockdown. We are also seeing the use of CI for knowledge-sharing being used in research and policy-making with businesses to focus on sharing intelligence in problematic areas, an example being the innovative Collective Intelligence Skills Observatory, led by the East Midlands Chamber in the UK (Rae et al, 2023).

In these ways, as well as in the cases, we see a recognisable progression from user-generated content and the sharing of Open resources such as open data, coding, science and innovation, towards applying this collective intelligence. Learning through CI involves being able to access and contribute to a shared, living body of knowledge. There is a tension between 'proprietary' individual knowledge which may convey competitive advantages, and shared knowledge

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<sup>19</sup> <https://www.geospatialworld.net/blogs/geoint-osint-comes-off-age-of-ukraine-conflict/>

which diffuses and may reduce the individual advantage, but shares the collective value. Entrepreneurial learning and learned behaviours are acquired, not just cognitively, but socially, emotionally, and imitatively, from and through ‘the collective’ experience. Decision-making may be especially important, as entrepreneurial work continually involves making situational decisions, based on experience, calculation, intuition etc.

We also see the links between individual and social creativity, or co-creation. There is a vast body of Open resources available as source materials for creative applications and for practical innovation. Creativity can be practised as a plural and social process, not simply an individual act. Multiple actors are connected in the creative processes of combining extant resources for value-generating new purposes. This follows the logic of Csikszentmihalyi (1996:8), that *‘an idea or product that deserves the label ‘creative’ arises from the synergy of many sources and not only from the mind of a single person’*. Creativity requires the ‘synergy of many’, as people working together have greater creative capacity to form new ideas more quickly than they possess individually, and their collective ability to transform ideas into action is greatly enhanced by their multiple skillsets and superior collective intelligence (Mulgan 2018a).

## **Conclusions**

We recommend future work on entrepreneurial agency, action, education and learning should recognise that the interconnections between Agency, Intelligence and Action are fundamentally important, and whilst they do not replace individualism, they make possible much more effective, inclusive and productive means of entrepreneurial working. The insight that ‘all entrepreneurship is collective’ (Nordstrom & Jennings, 2015) is not new; but the implications are still far from being universally understood and accepted, and so the methodological means by which Collective Agency and Intelligence can form part of the pedagogy needs to be researched and developed. For example, by extending the ‘Communities of Practice’ approach (Lave & Wenger 1991) to understand deeper how CI is created and shared within communities of practice. Sensemaking (Weick, 1995), by becoming collective, makes ‘sense’ more widely available, whilst shared entrepreneurial mindsets and competences can be diffused and available for development.

Mignenan (2021) hypothesised CI as connecting Human, Relational and Intellectual capital. Data and Artificial Intelligence should complement and supplement human judgement rather than replacing it. Human, collective and artificial intelligence should be recognised as complementary, involving complex interfaces between them are and requiring high-level skills (e.g. Seldon, 2018; Shadbolt & Hampson, 2018). But as AI advances rapidly, these connections and skills need to be developed and shared collectively, for the widest benefits.

Finally, we observed how forms of community and civil activism which represent novel, legitimate (sometimes marginally so) and generative forms of entrepreneurial collective intelligence. These can help address complicated societal problems where traditional conceptions of entrepreneurship tend to fail, because both entrepreneurial agency and intelligence function better when collectively distributed. Such forms of distributed organising appear to have greater resilience than traditional ‘command and control’ modes, for example for example in emergent and chaotic environments, as in the Ukrainian war theatre.

## **Published papers in this project**

Entrepreneurial Collective Intelligence, 3E conference, Dijon, France, May 2022



Exploring the role of Collective Intelligence in Entrepreneurial Practitioner Learning, ISBE conference, York, October 2022

The Role of Collective Intelligence and Collective Agency in Enterprising Communities. *Journal of Enterprising Communities*, 2023

### Unpublished

Conceptualising Entrepreneurial Collectives: Connecting learning, intelligence and agency. Submitted to *International Small Business Journal*, September 2022.

### In production

The Libertarian Collective: exploring the individual – collective intelligence construct in entrepreneurship and education as competing or complementary ideologies. Accepted for ISBE conference, Birmingham, October 2023

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