Open:UK

State of Open: The UK in 2024, Phase Three

Open Source and Market Shaping

Index

Cover photos are from our collaborator photographer Tiana Lea, who took 38 portraits for the OpenUK State of Open Exhibition sponsored by Arm[1]. We are grateful to Arm for their continued support of this work and will continue to document the people forming the UK Open Technology community in this way. Full list of cover participants at Section 6.

1 https://openuk.uk/photoexhibition/

1. Overview

1.1 Executive Summary

Market Shaping and Open Source explores how openness, primarily open source software but also open data and open standards shapes markets and how market factors shape open source adoption.

Offering Thought Leadership:

Mike Bracken explores 'Market Shaping' through a shift to opennes in the public sector (1.3) explaining that a 'default to openness and interoperability is the basis of economic growth in the wider public sector'.

Iain Mitchell KC, evolves thinking on public procurement and the impact this has on open source success and in his thought leadership piece, 'As with so much in life, it's about education and putting policy into practice.' (1.4).

Lonneke Driessen of the Open Charge Alliance shares the story of an open standard in EV charging battling 'the establishment' and existing market factors to shift a market for the better through openness (3).

Open source shapes Markets: Section 2, Shaping Markets through the Dynamics of Open Source explores the UK digital market, global open source market and the data related to open source adoption and its impact shaping markets.

As digital markets shift and and a desire to use and adopt open source increases, market shaping factors adapt to enable open source software adoption. If successful, existing vendor lock-in can be broken with new open source market entrants and better or collaborative innovation enabled. Done well, open source software offers well-managed code that may be recycled and reused. Becoming sustainable software requires a further shift in market factors to esure its well curated longevity.

Case studies demonstrate how markets are shaped:

UK AI Safety Insitute's open sourcing '**Inspect AI Safety Testing Platform**' offers the potential to shape the global AI testing environment by way of its opennes 'enabling it to achieve a level of global collaboration that would otherwise be unattainable'. (5.1)

BT and Canonical explore virtualising network functions on OpenStack, to transform its 5G components into software applications independent of underlying hardware in a sector shifting to open source(5.4)

The British Library considers enhancing market share, driving innovation, and fostering collaboration in the evolving digital landscape. (5.3)

OpenEHR (5.2) explores the NHS' persistent challenge of data fragmentation and the potential impact of open standards and open source software.

Section 4, Market Factors Shaping Open Source Adoption explores the factors that enable or disable a market's shift to opennes and its long term success.

1.2 Introduction to The Open Manifesto Report

Amanda Brock,
CEO, OpenUK

Open source software is the infrastructure on which today's digital environment is built. It is what Neil Lawrence[2] refers to as 'deep tech not weak tech'. Offering what Mike Bracken describes in this report as 'real technology provision' it requires an 'understanding of what technology actually provides' as opposed to simply procuring a perceived solution out of a box. This understanding must be something UK public sector and enterprises finesse, if they are to deliver to the UK's needs and compete on the global stage.

Open source adoption shapes digital markets

The financial benefits of open source usage are high, even if it is not quite free. There are also many other benefits gained from collaborative innovation through open source. These benefits and a shift in market factors have enabled adoption of open source at scale in the last decade to a point where 96% of software has open source dependencies and 77% of all software has open source origins.

As sectors have digitised they are inevitably software defined. This means in 2024, that their infrastructure has shifted to open source. This is not just the case in the tech sector but across all enterprises and the public sector. Many will have little or no understanding of what is 'under the hood' of their new digital world and lack the skills to manage this directly, but continue to buy-in support for open source. They may not have shifted the practicalities of their environment to suit this new open source model and factors from their procurement process and commercial terms, to requirements for insurance of the uninsurable may impact how open source succeeds and create friction in this process. This shift must now happen at pace.

Open source adoption inevitably disrupts markets. If enabled, it has the potential to shape a market by provoking a shift away from incumbent suppliers and giving the gift of a broader market through breaking lock-in and enabling interoperability. This offers a different and potentially better future for the market's customers and their ultimate consumers.

Revenue streams relying on software or patent royalties are significantly challenged by open source. Unsurprisingly the incumbents fight back when faced with this challenge. Lonneke explains the motor industry response to open standards which has been equally true across the automotive sector as it shifted to open source software and similarly can be seen today in mobile communications.

Section 2, Shaping Markets through the Dynamics of Open Source explores how open source shapes digital markets.

The myth of 'If you build it [open source software] they will come'

Believing this is guaranteed to lead to disappointment. 'They' will only come and use your software when the right market factors are in place. Irrespective of that software being shared on GitHub with an approved open source licence that of itself - despite meeting the legal definition of open source software - won't create adoption or sustainable software and infrastructure. If you build it they will not come, I am afraid.

2 Neil Lawrence, https://en.wikipedia.org/wiki/Neil_Lawrence

You will simply be dumping your code in a GitHub graveyard unless you meet the requirements of good curation of open source software - from a governance and technical perspective - and ensure that a community is built, users engaged and contributions enabled.

Market factors shaping open source success

Open source shapes markets but there are also factors in a marketplace that shape open source adoption and success. Over time, sectors have been seen to shift to adopt open source software and embrace it at scale. We have seen this in the UK Finance sector in recent years. It took many years for the conservative and regulated finance sector to reach this point. Many barriers were faced and crossed along the way.

The corporate gatekeepers - finance, legal and procurement - nervous of a perceived risk, in that open source did not fit existing norms, chose the path of least resistance to avoid the risk and blocked its adoption for many years. The shift in open source distribution via public repositories like GitHub and other public repositories has enabled open source to bypass those corporate gatekeepers as engineers simply bring code into their organisations without contract processes or payment. With the gatekeepers removed, the next challenge is the incumbents who of course don't take the loss of revenue streams sitting down.

Enabling open source success requires that an open source lens is applied to existing market factors (bringing an understanding of how each factor may inhibit or promote adoption and success). These are explored in section 4 'Market Factors Shaping Open Source Adoption' and encompass both the open source specific factors unique to its model and understanding how existing market factors impact it. Both of these shape markets including open source.

Laissez faire versus intervention

Ensuring that the challenge is met and open source enabled may require conscious acts and intervention as opposed to relying on a laissez faire approach. To intervene in an appropriate manner requires an appropriate understanding of open source and the impact of those market factors on it. Any successful intervention requires legal, technical and community understanding.

Meeting today's challenge head on

OpenUK has proudly shared the UK's position as number 1 in open source software in Europe many times through its reporting.

Today, whilst that position and our global 5th remains the same this position can be seen to be under threat.

Germany is growing at pace with the potential to take over the number 1 position by 2030 if UK growth does not increase. Whilst this report focuses on software and not AI, which will be the subject of OpenUK's December update report, we also see France ahead of the UK in opening AI.[3]

With a new government, and a world of digital opportunity, the UK is at a critical moment in time when it must grasp open source with both hands to secure its digital leadership and its future. We have the opportunity to strengthen and grow but only if action is taken.

3 Tortoise, The Global AI Index 2024 https://www.tortoisemedia.com/intelligence/global-ai/

1.3 Thought Leadership: Market Shaping

Mike Bracken
Founding Partner, Public Digital

About 100 years ago, Thorsten Verblen coined the term 'technological determinism'[4]. He was describing how technological development and innovation had become the principal motor of social, economic or political change. Yet in 2024, the UK public sector remains locked in a broken dialogue with 'the market' when it comes to its technology provision. If this does not change, and quickly, we can forget talk of missions and sunlit uplands of economic growth.

The UK Challenge

The primary challenge for the new UK Government is to form a realistic, and data informed view of the various technology, digital and data markets in its purview. The current landscape does not lend itself to happy outcomes for incoming Ministers but I remain optimistic that in short order the UK can benefit from dynamic markets in a public oriented technology.

I write this en route from India, where the emergence of Aadhaar and other open-protocol based technology standards bring more than 400 million people into the democratic formal banking systems. And who do they reference as an inspiration? The UK. Tim Berners-Lee, Bletchley Park and the engineers who pioneered the protocols of the open Internet. Our design and technology history is a global phenomenon based on open, interoperable services and innovation. The exception to that, all too often, is the way we have boxed-in our own public sector economy over the last few decades.

We need to take a dispassionate view of our current 'markets', which are too often little more than oligopolies, with rent seeking suppliers restricting choice, and contributing to rising costs. If that sounds extreme, let's consider the markets which need rapid intervention:

Across Markets

In **Central Government**, we have doubled down on an oligopolistic approach despite Parliament's 2011 description of the public sector technology market as a 'Recipe for Rip-Offs''[5] Too often, a small number of consultancies constitute the 'market' for technology services. In addition, the broken model of system integrators seen recently in the Post Office fiasco means that we have abstracted ourselves from real technology provision and understanding of what technology actually provides. After opening up the market to thousands of digital and technology SMEs in the coalition years, and advocating for the use of open source software and code in the open, we have drifted back into a procurement model of huge, multi-year contracts with consultancies and made building open, home-grown markets even harder.

In **healthcare**, the situation is worse. For 20 years the central health procurement strategy has been to award large, closed contracts to a small number of health insurance software providers - few of them UK based - which means our health outcomes are lowered and costs duplicated. The absence of a market for

4 Wikipedi, Thorsten Verblen, Technological Deternminism https://en.wikipedia.org/wiki/Technological_determinism
5 House of Commons Public Administration Select Committee Report, A Recipe for Rip Offs chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://publications.parliament.uk/pa/cm201012/cmselect/cmpubadm/715/715i.pdf

open, interoperable Electronic Patient Records in secondary care is testament to decades of shocking choices. In primary care, even Frank Hester's odious remarks[6] result in little change to a duopoly of provision.

The **local** market is similarly bleak. Our 500+ local authorities lack scale, locked into an oligopoly of proprietary technology and service providers, unable to access our own data and mandated to use systems which lock in inefficiency and poor outcomes for some of the most vulnerable in society like children and adults in the social care system.

In **international** markets, where we have much less agency, we have chosen not to use our substantial skills and leverage in the public realm, and instead accepted supplier conditions which would make mafiosi blush. The 'cloud' market, for raw compute power and tooling, remains a binary choice between non-competitive hyperscalers. Our international pioneering and use of open protocols on identity, payments and common platforms - what is coming to be known as digital public goods and infrastructure - often remains limited by our demands that each part of our byzantine public system remains, in some unspecified way, special, unique and different in technological terms.

Our **data** market should be the engine of public sector AI growth and a massive boost to our economy. Yet our public datasets - land registries, health data and geo-spatial data - are locked in siloes without common standards or sensible market access, or even worse, hidden via rent-seeking contracts where providers refuse to even share our own data back to us. Our postcode address data - literally the engine for location based technology - is not even in the public realm, given to the Royal Mail as a sweetener by George Osborne. These choices over decades means a wholesale review of our data estate is needed, not simply selling off health data as Tony Blair recommends.

How openness can transform public sector tech

The fundamentals for growth remain: skills, a culture of public sector technology development, institutions capable of growth given political direction, and a world class academic and research capability.

What's needed now is political grip and alignment around a vision: the UK as a leader in public oriented technologies. The good news is that we have simply neglected to use a range of available tools and techniques to shape these markets.

The first move is to adopt **regulatory change with an unrelenting bias to openness**.

In the NHS we should mandate open standards and interoperability of our data, and back it up with strong central agency to enforce delivery. Local data, similarly, needs to be available for local and national use, as a condition of market involvement. Across all our markets, widespread mandation of open, interoperable standards as a condition of market provision should be applied sensibly but quickly. In many markets this will need little more than a series of secondary instruments and a small team of standard setters with the ability to mandate across Government agencies and departments. In global markets, we can work with other countries to implement, for instance, switching capability between cloud providers as we have done in telecoms, to avoid our public sector data disappearing into data silos. I am confident that a series of bold regulatory changes will be embraced by the majority of providers, entrepreneurs and private sector players currently frozen out.

The **cost and speed of software provision** is falling fast, yet our procurement based system means we are getting slower and ever more expensive outcomes. Covid taught us that crisis responses work, and that small groups of multi-disciplinary teams can provide national scale policy outcomes at pace. We should

6 https://www.bbc.co.uk/news/uk-politics-68539981

consider **market entry** as a necessary tool. As the early phase of GDS showed us and the Covid teams demonstrated again, we can deliver public policy outcomes more quickly than many of our 'markets' regardless of Treasury orthodoxy.

Standards drive openness, and open markets drive economic growth. We should embrace **open protocols to drive our international reach**. Take UK Gov Notify, a huge success borne of a simple adoption of open protocols to change a public sector market. This service took an inefficient and duplicative market - bulk texts, letters and appointments - and created a platform used by over 1,600 organisations in the UK. The market became more competitive, Government more efficient and users were offered better communication, driving reduced waste in missed appointments.

An open, interoperable public sector

A default to openness and interoperability is the basis of economic growth in the wider public sector. And I am deeply optimistic about our ability to make that a reality.

Quick results are possible and having seen these and other tools used globally, it will be a lot less painful than we think. Within a decade, I believe the choice to become an open, interoperable public sector can drive outstanding public policy outcomes and exponential growth in our technology, digital and data economy. It's a multi hundred billion pound opportunity, and I believe a long term positional challenge for this country which transcends party politics.

1.4 Shaping Markets: Developing the Open Source Market through Public Procurement

Iain Mitchell KC
Tanfield Chambers

The Economic case

Public procurement may not look like an exciting topic, but it is of huge significance as one of the principal shapers of the market. According to the OECD, it was responsible for 12.9% of World GDP in 2021 and it accounted for 16.1% of the UK's GDP in 2020[7].

At the international level, the World Trade Organisation ('WTO') recognises the key role which public procurement has to play in stimulating world trade. It states, on its government procurement gateway, that open, transparent, and non-discriminatory procurement is generally considered to be the best tool to achieve value for money. However, although public procurement has the potential to contribute positively to the world economy, it also has the potential to impact it harmfully. The WTO recognises just how critical public procurement is in setting and implementing market policies, referring to the use by national governments of procurement to achieve domestic policy goals, warning that preferential treatment for domestic goods, services, and suppliers operates as a trade barrier by discriminating against foreign suppliers.

The risk that public procurement might be used by national governments to create trade barriers has long been recognised by the European Union ('EU') and was the driver in its promulgation of the EU Procurement Directives under Article 3(3) of the Treaty on European Union (which deals with the creation of the Single Market). The Directives have changed and developed over the years to be more proactive in pursuing certain policy objectives, including the importance of fostering innovation; and from these directives and the underlying Treaty Obligations there has grown up a body of EU jurisprudence on public procurement, which has continued in large measure to apply in the UK after Brexit as retained EU Law.

If public procurement is such a powerful economic lever, so too, the Tech sector forms a significant part of the economy, contributing about 7.2% of the UK's GAV[8]. Putting these two figures together, it becomes obvious that public procurement in the tech sector can be a very powerful economic lever. Indeed, the UK Government has for some time recognised the key role that public procurement has to play in fostering an Innovation Economy: as long ago as 2010, the Government first articulated its commitment to open technologies and software. In 2017 it published a paper, Leveraging procurement to grow the Innovation Economy, a key element of which was a focus on open innovation processes in the tech sector as well as other sectors.

Phase one of the OpenUK report, The State of Open, published in March 2021[9] discussed the contribution of FOSS working to the UK economy. The Report referred to estimates that there were at that time 126,000 developers actively contributing to open source software projects in the UK with up to £43.15 billion contributed to the UK economy each year through open source working. Pre-Brexit, the UK was the EU's largest FOSS contributor, considerably ahead of Germany and France. As a consequence of Brexit, the EU Commission, in its 2021 Report The impact of open source software and hardware on technological independence,

7 OECD
8 7.2% of the UK's GAV
9 OpenUK (2021) The State of Open, Phase 1

competitiveness and innovation in the EU economy[10], scaled back the reported number of open source developers in the EU by 230,000 (though it considered that reduction to be overly conservative). This source therefore suggests that the true number of open source developers in the UK in 2021 was likely to be nearer 200,000 and the value to the UK economy significantly higher.

As the OpenUK report discloses, the UK is the fifth largest contributor to the Cloud Native Environment, and one of the world's largest contributors to FOSS, with one of the world''s largest numbers of users. Many of the users and contributors to FOSS are not involved in avowedly FOSS companies but are working in mainstream business, in other technology companies, or working remotely for international companies, or across the public sector.

Taking all of this together, it is clear beyond a peradventure that public procurement in the tech sector has the potential to supercharge innovation and drive up the UK's share of the world market in the Tech sector by actively promoting Open technology. This has been recognised by the UK Government in a series of initiatives, for example, the setting up in 2021 by the Cabinet Office of an Open Standards Advisory Board.

However, for potential to be realised and for policies to work, they need to be properly implemented by the people on the ground who are charged with carrying out procurement exercises. There are a number of cases from the UK and across the EU which sound warning notes.

Roadblocks and Impediments

The cases have unfolded over a number of years, at the same time as the market has developed and (at least one hopes) public understanding of the Open Source model has improved, but it is worth mentioning a few of the cases which still stand as valuable guideposts.

'You Can't Specify Open Source'

It is certainly the law that, when setting out the Specification in a public procurement Invitation to Tender, the procuring authority cannot specify a specific product. Thus, in one case, the process was found to have been unlawful where the tender specified that the operating system to be used had to be UNIX (see European Commission v The Netherlands [1995] ECR 1-15)[11], though other cases have permitted the fig leaf of adding, after the specified product the words 'or equivalent' (Bent Mousten Vestergaard v Spottrup Boligelskab [2001] ECR 1-09505)[12]

This led to a belief in some quarters that the acquiring authority could not specify 'open source'. However, 'open source' is neither a brand name nor a product, but rather a software with a particular non-technical characteristic (the terms under which it is licensed) or even a technical characteristic (the ability of the source code freely to be modified), and so, in principle, it is perfectly possible to specify Open Source in a tender, provided that can objectively be justified.

Of course, the real problem is not a supposed prohibition, but the need for the acquiring authority to actually want to use open source.

You can choose what you want, but it has to be objectively justifiable.

10 EU Commission (2021)
11 European Commission v The Netherlands (1995) ECR 1-09505
12 Bent Mousten Vestergaard v Spottrup Boligelskab (2001) ECR 1-09505

This principle derives from the case of Concordia Bus Finland Oy Ab [2002] ECR I-7251[13]. It does however cut both ways. It means that an acquiring authority can, as explained, specify Open Source if it can justify that choice, but it also it is at least capable of justifying bad choices, as in the Scottish case of Elekta Ltd. v Common Services Agency 2011 SLT 815[14], an example of:

Vendor Lock-in

In the Elekta case NHS Scotland used Concordia Bus[15] to justify its conscious decision to specify that the new linear accelerators which it wished to purchase completely to replace its existing ones should be run on the existing software (which was proprietary software which could work with only one supplier's machines). Unfortunately, Elekta failed to argue whether that was an objectively justifiable choice (a failure specifically commented upon by the judge).

Excluding Open Source

The other side of the Concordia Bus coin is that it is at least theoretically possible that an acquiring authority might lawfully choose to exclude Open Source – that opens the door to all the old canards: that Open Source is not reliable, that there is no-one to take responsibility, that it is not secure etc. etc. However the key to fighting back on this is the requirement for objective justification.

Joint Development

A very different issue is that the procurement rules could accidentally serve to stifle innovation.

In the case of Fabricom SA v Belgium [2005] ECR I-1577[16], the ECJ warned of the danger that where a would-be tenderer had worked jointly with the acquiring authority in developing the project that is out to tender, that could give it an unfair advantage over its competitors. It was partly in response to this that the 2014 EU Directive introduced detailed rules to allow Innovation Partnerships.

Moving Forward

It is clear from the above that the Public Procurement rules provide a robust framework for permitting the encouragement of Open innovation, but they are only a tool, which could equally be applied to exclude open source (on whatever pretext could be dressed up as objective justification).

Moving forward is not about rules – it is about creating the will. It is about recognising the overwhelming economic case and bringing around the individuals within public authorities who actually write the specifications and award the contracts.

As with so much in life, it's about education and putting policy into practice.

13 Concordia Bus Finland Oy Ab (2002) ECR 1-7251
14 Elekta Ltd. v Common Services Agency (2011) SLT 815
15 Concordia Bus Finland Oy Ab (2002) ECR 1-7251
16 Fabricom SA v Belgium (2005) ECR 1-1577

2. Shaping Markets through the Dynamics of Open Source

2.1 Background

The open source software sector, through its approach to open innovation[17], acts as a disruptive force that influences markets while at the same time, activity in the markets influences the success of open source by fostering increased competition and encouraging new entrants, particularly in the technology sector. The interplay between open source and the market has the potential for market transformation - improved efficiency, innovation, and the development of new business models that leverage collaborative efforts across various industries. Market shaping can be observed in the way organisations achieve competitive advantages, particularly by using tools and strategies that enhance their capacity to innovate and adapt in a rapidly changing environment and that highlight the exchange between disruption and how different factors in the market influence its success[18].

Open source tools can allow for dispersed collaboration and data-driven insights ensuring visibility and related decision making across distributed teams. For example, GrimoireLab enables organisations to optimise their investments in open source projects by providing critical insights into which projects are most active, where key contributions originate, and how resources are being utilised. This empowers organisations to make data-driven decisions, ensuring that their investments in open source software yield the highest returns. For instance, large organisations like The Linux Foundation and IEEE utilise GrimoireLab to manage and monitor projects critical to their operations, directly supporting the broader tech economy that increasingly relies on open source software[19]. This not only boosts their competitive edge but also enhances economic sustainability by ensuring efficient community engagement and reducing the risks of project failures and inefficiencies. It then contributes to the overall economic viability of open source initiatives globally.

The key metrics to assess market shaping and dynamics can be effectively measured through indicators like technical talent management, community engagement, and resource allocation. These metrics are crucial in understanding how well an organisation adapts to and thrives in a competitive market environment. For example, the 2024 State of Tech Talent Report by The Linux Foundation[20] highlights the resilience of the tech sector, where despite economic challenges, a majority of IT organisations either maintained or increased their technical headcount in 2023. This approach to managing technical talent not only preserves valuable institutional knowledge but also positions organisations to leverage new opportunities and remain competitive, demonstrating the critical role of strategic talent management in driving market success. By integrating such metrics, organisations can better navigate the complexities of market dynamics and maintain their competitive advantages in the evolving landscape.

2.2 The UK Digital Economy and Public Sector Spend

Tech Nation's June 2024 Report, sees the combined market valuation of the UK tech sector to be $1.1 trillion in Q1 of 2024[21].

In the Autumn Budget 2024[22], the UK Chancellor, Rachel Reeves, emphasised the role of technology in enhancing public sector productivity.

17 Github (2024) Octoverse: The State of Open Source and Rise of AI in 2023: https://github.blog/news-insights/research/the-state-of-opensource-and-ai/
18 CHAOSS Community (2024) GrimoireLab 1.0.: https://chaoss.community/grimoirelab-1-0/
19 Bitergia (2024) The Journey of GrimoireLab: Lessons Learned: https://bitergia.com/blog/bitergia/the-journey-of-grimoirelab-lessons-learned/
20 Linux Foundation (2024). 2024 State of Tech Talent Report: https://www.linuxfoundation.org/hubfs/LF%20Research/lfr_techtalent24_040324a.pdf
21 https://technation.foleon.com/research/tech-nation-report-2024/#:~:text=The%20Tech%20Nation%20Report%202024&text=Discover%20the%20investment%20data%20and,in%20the%20age%20of%20AI.&text=%E2%80%9CThe%20UK%20tech%20sector%20reached,in%20our%20remarkable%20growth%20story.%E2%80%9D
22 https://www.gov.uk/government/publications/autumn-budget-2024

The first budget under this new Government includes a £2 billion allocation for NHS technology and digital improvements aimed at increasing efficiency. Undoubtedly targeting the NHS's digitalisation challenge highlighted in his Thought Leadership by Mike Bracken in this report and focusing on the data dichotomy explored in OpenEHR's case study.

Additionally, the government has set a 2% productivity, efficiency, and savings target for all departments, encouraging the effective use of technology and the integration of services across government.

These measures reflect a strategic focus on leveraging IT to improve public services and operational efficiency but as yet do not demonstrate an understanding of the requirements of success in a digital market, going beyond law and policy to ensuring the factors that shape the market are enabled for a shift to openness.

2.3 Global Open Source Market

In 2024, Harvard produced its first report focused on the value of open source software considering value generated by open source software. Its previous approach used by it and others assessing the cost of creation. Using a new methodology it demonstrated the global value of open source to be $8.8 trillion[23]. The report states that firms would need to spend 3.5 times more on software than they currently do if OSS [open source software] did not exist'.

The report uses commercial data under licence to build this figure[24]. Whilst the methodology is open and shared, unfortunately the necessary data is not licensed to enable the date or outputs of the report to be cut by geographic area and currently the methodology used can therefore not be applied to the UK.

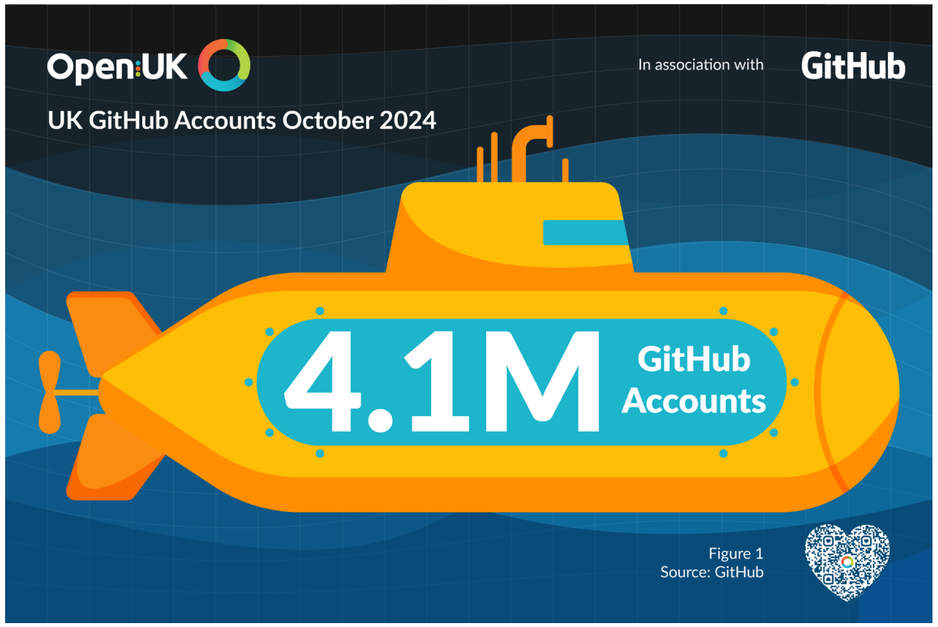
The UK has generally been seen to be the 5th player in the global market and number 1 in Europe by lines of code contributed and number of open source software developers. Whilst an accurate calculation on the UK's value cannot be made without access to the licensed data, it is clear from the UK's position in contribution that a significant amount of that value has been generated by individuals based in the UK.

2.4 The Open Source Submarine Under the Digital Economy

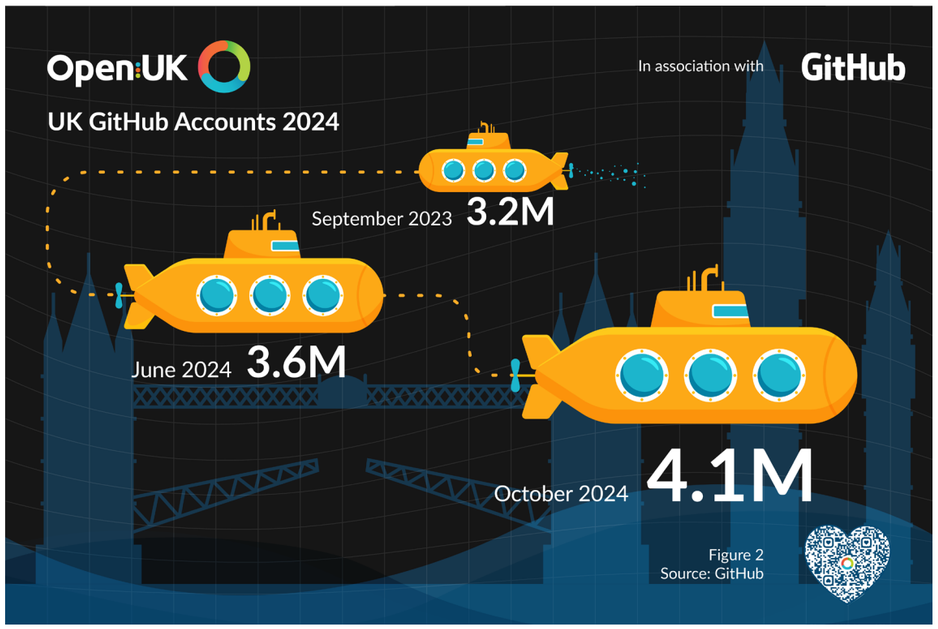
OpenUK has focused on value generated by open source software in its economic calculations since 2021, and demonstrated 27% of the UK's Digital economy[25], a figure which is undoubtedly growing. The UK's open source software contributions has been referred to as the 'submarine under the digital economy[26]' generated by an internationally collaborating, often home-woking group spread across the UK, that is often invisible in its home geography.

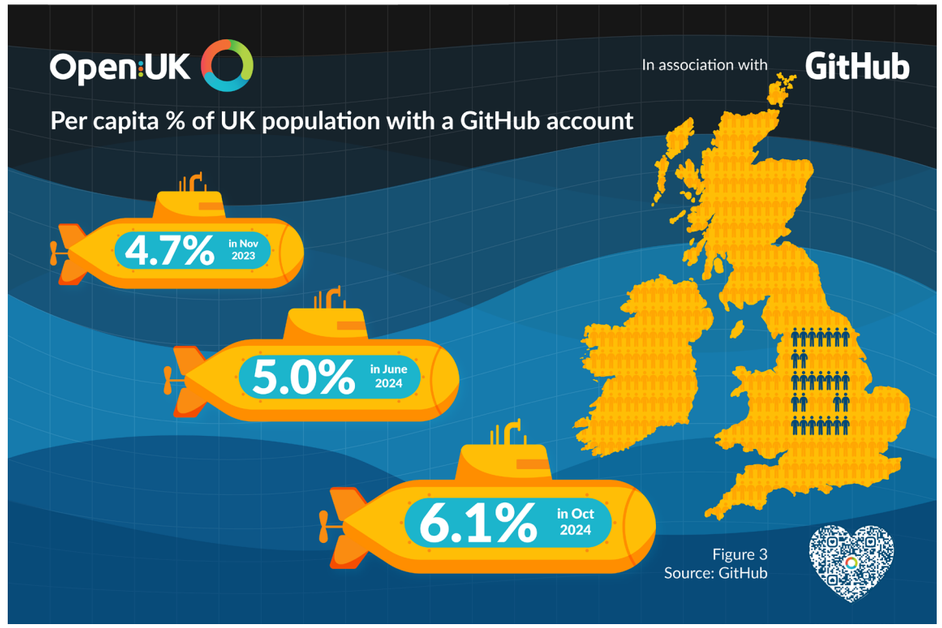
GitHub accounts have long been used as the measure of open source developers in any country and these numbers are embedded in the economic calculations of total cost of use or value of open source software. Phase One of this 'State of Open: The UK in 2024' Report published in February, shared that the UK had 3.2 million GitHub accounts[27], growing from Phase 3 'State of Open: The UK in 2023' in October when the UK had a mere 3 million GitHub accounts.

23 Harvard Value of Open Source Software Report, Manuel Hoffmann, Frank Nagle and Yanuo Zhou, sponsored by the Linux Foundation https://www.hbs.edu/faculty/Pages/item.aspx?num=65230
24 https://youtu.be/yRp3tchdxEs?si=q0ZbccppWZL6dvI1
25 OpenUK State of Open The UK in 2023: Phase 2, Show us the Money, https://openuk.uk/stateofopen/state-of-open-the-uk-in-2023-phase-2-part-1/
26 This phrase was coined by Liam Maxwell of AWS.
27 OpenUK. The State of Open, The UK in 2024 Phase One AI and Open Innovation https://openuk.uk/wp-content/uploads/2024/02/State-of-Open-The-UK-in-2024-Phase-One.pdf



As of October 2024 the number of UK GitHub account holders sits at 4.1 million. That is 6.1% per capita of the UK population continues to be more per capita than any other country in the world. It has increased by almost 1 million in the 9 months since January.





2.5 Key Metrics in Open Source Shaping Markets

2.5.1 Adoption rate

The adoption rate of open source technologies and practices is a critical indicator of how industries are evolving to meet the demands of modern technology. Open source fosters collaboration, accelerates development, and democratises access to advanced tools, allowing organisations of all sizes to innovate and compete more effectively. This trend is evident in the growing adoption of open source platforms and tools, which are increasingly becoming the backbone of technological advancement across various sectors. The widespread adoption of these technologies highlights the shift towards more collaborative and transparent innovation processes that benefit a broader range of stakeholders[28].

28 Forbes (2024) The Real Value of Open Source: Saving Time and Money https://www.forbes.com/2024/02/15/real-value-of-opensource-saving-time-and-money

According to the 2024 Synopsis Report, of 1067 code bases across 17 industries during 2023, found that open source components form the backbone of almost every application in every industry. 96% of the total codebases (the code and associated libraries that make up an application or service) contained open source and 77% of all code in the codebases originated from open source software[29].

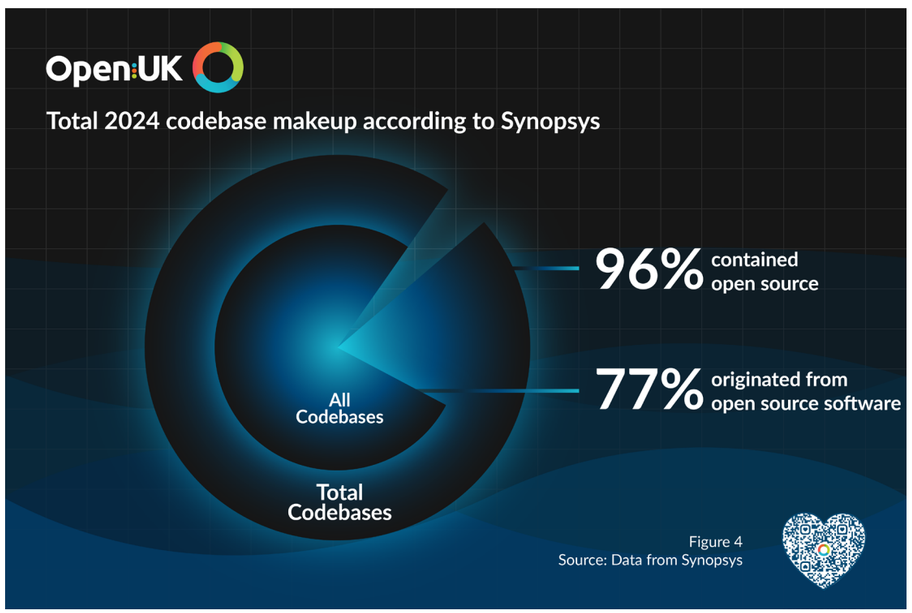


Figure 4
Source: Data from Synopsys

2.5.2 Key Adoption trends

AI

One notable example of this trend is the adoption of Granite AI models on platforms like GitHub and Hugging Face. These models, developed by IBM, represent a significant milestone in the advancement of opening AI technologies. By making these models widely accessible, IBM has empowered a broad spectrum of users, including small and medium-sized enterprises ('SMEs'), to leverage advanced AI tools that were previously beyond their reach. This democratisation of AI technology is crucial as it allows more industries to innovate and compete, driving overall technological advancement. The growing use of Granite models reflects a broader trend toward openness in varying degrees in AI, where the collective input and collaboration of the community contribute to the continuous improvement and scalability of these tools[30].

Kubernetes

Similarly, the adoption of cloud native technologies, particularly Kubernetes, further illustrates the profound impact of open source platforms on modern IT infrastructure. According to the 2023 CNCF Annual Survey[31] 84% of organisations are either using or evaluating Kubernetes, underscoring its critical role in enabling organisations to achieve greater efficiency, scalability, and flexibility in their cloud operations.

29 Black Duck (2024) 2024 Open Source Security and Risk Analysis Report. https://www.blackduck.com/blog/open-source-trends-ossra-report.html#:~:text=2024%20OSSRA%3A%20Rising%20concerns%20for%20open%20source%20management,-Now%20in%20its&text=This%20report%20uses%20data%20from,and%20acquisition%20(M%26A)%20transactions
30 Forbes (2024) IBM Releases Granite AI Models to Open Source Community https://www.forbes.com/sites/stevemcdowell/2024/05/13/ibm-releases-granite-ai-models-to-opensource-community/
31 CNCF (2023) CNCF Annual Survey 2023 https://www.cncf.io/reports/cncf-annual-survey-2023/

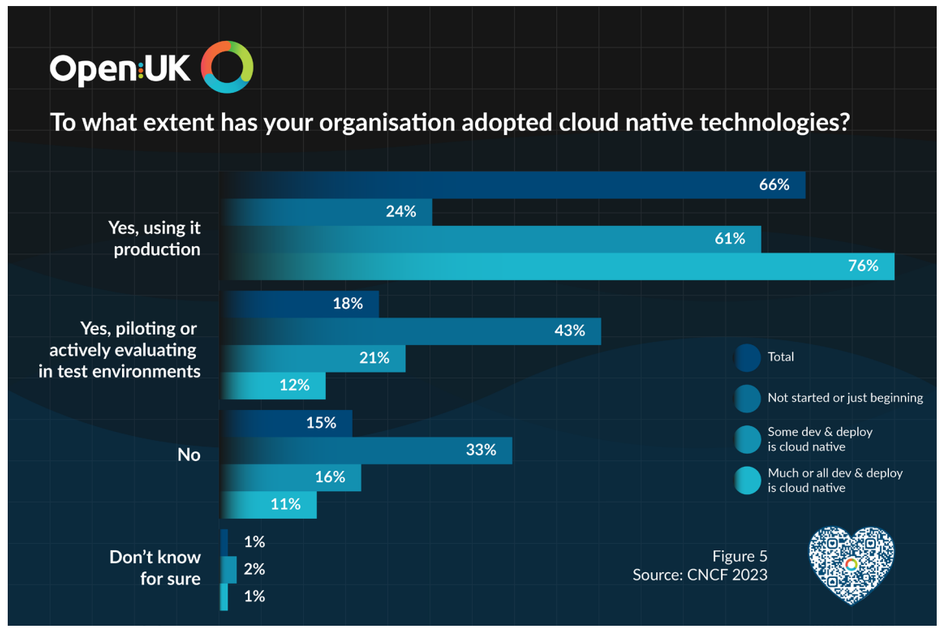


Figure 5
Source: CNCF 2023

The widespread adoption of Kubernetes in the last decade solidifies its position as a fundamental technology in the global IT and cloud landscape, much like the now 30 year old Linux Kernel. This trend not only accelerates innovation in cloud technologies but also sets the stage for Kubernetes to play a pivotal role in the integration of emerging technologies, further cementing its importance in the future of cloud and platform infrastructure.

Blockchain

Hyperledger technologies are gaining momentum in the UK, particularly among organisations seeking to leverage blockchain for transparency and efficiency. Recent studies indicate that approximately 49% of businesses are very or extremely familiar with Hyperledger frameworks. This growth underscores a broader recognition of the benefits of collaborative approaches in driving technological advancement and economic growth, particularly in sectors including finance and supply chain management[32]. By enabling organisations to collaborate on secure and scalable solutions, Hyperledger further enhances the competitive landscape across industries.

Databases

The Open Source Database Market is an area of major growth particularly in the finance sector. It was valued at approximately USD 10 billion in 2023[33] and is predicted to grow at pace. Recent research by Percona suggests that 42% of of all database instances today are being licensed via community supported open source models[34].

32 Linux Foundation (2023) Hyperledger Brand Study 2023. https://www.linuxfoundation.org/hubfs/LF%20Research/Hyperledger%20Brand%20Study%202023%20-%20Report.pdf?hsLang=en
33 https://www.businessresearchinsights.com/market-reports/open-source-database-market-103410
34 Percona (2023) Open Source Outpaces Proprietary Solutions https://learn.percona.com/hubfs/Whitepapers/2023_Percona_SurveyReport.pdf

Market drivers include cost effectiveness, flexibility, performance and scalability, data security and sovereignty and compatibility with cloud and contemporary technologies.

These examples of open source technology adoption highlight the broader movement towards open source solutions that is essential in driving the future of technology across industries. By enabling more inclusive and collaborative innovation, these technologies are disrupting conventional market dynamics and paving the way for continued economic growth and technological advancement[35].

2.5.3 Catalysing Innovation

Open foundation models ('OFMs'), characterised by their widely accessible model weights, have played a significant role in redistributing socio-economic power and fostering innovation across various sectors. By allowing a diverse range of entities beyond just large corporations which have the resources to develop and deploy advanced technologies, OFMs democratise access to cutting-edge AI tools. This distribution of power helps mitigate market concentration, ensuring that technological advancements are not monopolised by a few players but are instead accessible to a broader audience, including smaller businesses and research institutions. This shift is crucial as it empowers more stakeholders to influence technological trajectories, fostering a more equitable and competitive landscape[36]. This is a key advantage openness brings to a market. The economic impact of OFMs is equally profound, with the generative technology market projected to reach $1.3 trillion by 2032, largely driven by the advancements these models enable. OFMs catalyse innovation by providing a foundation for research and development in various domains, from tech safety to new applications in industry. The accessibility of these models promotes experimentation and iteration, leading to faster technological breakthroughs and more diverse applications. By ensuring that the benefits of advanced tools are widely distributed, OFMs contribute to a more robust and dynamic ecosystem, driving economic growth and innovation across multiple sectors[37].

2.5.4 Finance Sector

The UK's finance sector is a prime example of how open source technologies can drive innovation and enhance operational efficiency. By leveraging open source solutions, collaborative development and community-driven improvements, financial institutions can reduce reliance on proprietary software, leading to lower costs and greater flexibility. This approach not only allows for the rapid deployment of new financial service products but also fosters a culture of transparency and collaboration, crucial for building trust in the industry. The UK is witnessing a surge in open source adoption in the finance sector with initiatives that bring together banks and tech companies to innovate collectively, enhancing operational efficiency and customer experience[38]. This collaborative spirit not only empowers smaller players to compete but also drives systemic change within the financial ecosystem, leading to increased resilience and adaptability in an ever-evolving market[39].

2.5.5 Technical Talent

Technical talent management is a key metric in evaluating an organisation's capacity to innovate, adapt, and maintain competitiveness, especially in rapidly evolving sectors like technology. By effectively managing and nurturing technical talent, organisations can ensure they are equipped to meet current challenges and

35 Forbes (2024) The Real Value of Open Source: Saving Time and Money https://www.forbes.com/2024/02/15/real-value-of-opensource-saving-time-and-money
36 Stanford HAI (2023) Considerations for Governing Open Foundation Models https://hai.stanford.edu/sites/default/files/2023-12/Governing-Open-Foundation-Models.pdf
37 Stanford HAI (2023) Considerations for Governing Open Foundation Models https://hai.stanford.edu/sites/default/files/2023-12/Governing-Open-Foundation-Models.pdf
38 Egan, M (2024) Open Source in UK's Finance Sector: Carpe Diem https://strategynext.co.uk/opensource-in-uk's-finance-sector-carpe-diem
39 Fujitsu Postgres (2024) The Future of OS: Enabling Secure and Scalable Open Source in Finance https://www.postgresql.fastware.com/blog/opensource-in-uk-finance-sector-carpe-diem

seize future opportunities, making this an essential focus area for sustained growth and success in the tech industry.

The 2024 State of Tech Talent Report by The Linux Foundation provides a comprehensive analysis of the current trends in technical talent management, emphasising the resilience of the tech sector despite economic challenges.

The report reveals that contrary to widespread reports of layoffs, a majority of IT organisations either maintained or increased their technical headcount in 2023, with 37% increasing and 34% maintaining their staffing levels. This trend highlights the importance organisations place on sustaining their technical workforce to ensure continued innovation and adaptability, particularly in critical areas like cloud services[40].

The impact of these decisions is significant, as maintaining or increasing headcount during economic downturns positions organisations to leverage new opportunities and remain competitive. This approach not only preserves valuable institutional knowledge but also reduces the costs associated with turnover and external hiring. Moreover, the emphasis on upskilling and cross-skilling existing employees is a strategic response to the economic imperative of optimising resources while preparing the workforce for future technological advancements. This strategic management of technical talent underscores the importance of long-term planning in ensuring that organisations are equipped to navigate both current and future challenges[41].

2.5.6 Participation and Support

Participation rates and community growth in open source initiatives reflect engagement levels and collaboration, which are directly tied to innovation potential and resource utilisation efficiency. Strong participation and active communities lead to faster problem-solving and more diverse contributions, thereby driving innovation and economic value[42]. They also offer the potential for software sustainability.

2.5.7 Community Growth

The participation rate in open source communities, as reported in the Open Source Report, is a crucial metric reflecting the expansive influence of open source technologies and the potential for the software they support to be sustainable.

With 73.37% of respondents identifying as users of open source products, and an increasing number of these users contributing to and maintaining these projects, it is evident that open source is becoming a cornerstone of technological innovation. The high engagement levels within these communities not only drive the development of new technologies but also ensure continuous improvement through collaborative efforts. This participation is vital for fostering a culture of innovation, where contributions from a broad user base lead to the creation of more robust, secure, and adaptable technologies[43].

Economically, the growth of these communities, with nearly 60% of operators belonging to groups of fewer than 200 users, indicates a thriving environment for specialised technological development. These smaller, active communities are often hotbeds for innovation, where niche technologies can be developed and refined before being adopted on a larger scale. The economic impact of this is significant by lowering barriers to entry and reducing costs associated with software development, open source communities enable a wider range of companies, including startups and SMEs, to innovate and compete in the global market. This, in turn, drives broader economic growth and helps sustain a dynamic and competitive technology landscape[44].

40 Linux Foundation (2024) 2024 State of Tech Talent Report https://www.linuxfoundation.org/hubfs/LF%20Research/lfr_techtalent24_040324a.pdf
41 Linux Foundation (2024) 2024 State of Tech Talent Report https://www.linuxfoundation.org/hubfs/LF%20Research/lfr_techtalent24_040324a.pdf
42 Kaiyuanshe (2023) 2023 China Open Source Report https://kaiyuanshe.github.io/2023-China-opensource-Report/en/questionnaire.html
43 Kaiyuanshe (2023) 2023 China Open Source Report https://kaiyuanshe.github.io/2023-China-opensource-Report/en/questionnaire.html
44 Kaiyuanshe (2023) 2023 China Open Source Report https://kaiyuanshe.github.io/2023-China-opensource-Report/en/questionnaire.html

2.5.8 Impact

Open source software has had a profound economic impact, particularly in reducing costs and driving innovation across industries. By enabling access to more freely distributed and modifiable source code, open source solutions can save organisations up to 40% in software costs compared to proprietary alternatives[45]. This cost-efficiency is especially critical for startups and SMEs, as it allows them to allocate resources more effectively and invest in other areas of growth, thereby enhancing their competitiveness. Additionally, open source adoption has been linked to increased productivity, with studies showing that companies integrating open source tools experience up to a 30% reduction in development time[46].

Moreover, the widespread adoption of open source software contributes significantly to GDP growth and job creation within the tech sector. For example, the State of Open: The UK in 2023 Phase two found £13.59 billion of value (GVA) generated by products and services related to Open Source Software in 2022. This means that the Open Source businesses' estimated £13.5 billion contribution is 27% of the Tech Sector's contribution to UK GVA[47].

By promoting a collaborative development environment, open source technologies not only drive economic efficiency but also stimulate technological advancements on a broader scale, positioning countries like the UK as leaders in the global tech landscape.

Indicators like integration of open source technologies, participation in collaborative platforms and establishing an Open Source Program Office within organisations provide insights into how businesses create more agile and responsive ecosystems. The widespread use of cloud-native technologies, such as Kubernetes, underscores the critical role in enabling organisations to achieve greater efficiency, scalability, and flexibility[48]. According to the 2024 State of Open Source Report (OSI), 95% of organisations worldwide, either increased or maintained their open source software use, with a notable uptick in early stage startups and large enterprises.

2.5.9 Organisational Open Source Policies

According to the 2024 Open Source Professionals Job Survey by the Linux Professional Institute, the increasing emphasis on open source policies within organisations is indicative of a broader shift towards integrating open source into corporate strategies. A remarkable 89% of respondents consider an employer's open source policy as a significant factor in their job choices.

This finding underscores the growing recognition of open source as not just a technical preference, but as a critical element of organisational culture that influences job satisfaction and employee retention. Open source policies facilitate greater collaboration, transparency, and innovation, which are increasingly valued in today's rapidly evolving technological landscape[49].

The adoption of policies such as open source policies, employer-provided training, and certification programs has substantial economic and professional implications. For instance, 74% of respondents highlighted the importance of employer-provided training and certification, demonstrating a clear demand for structured support in adopting open source. This emphasis on continuous learning and professional development

45 New York Times (2024) What to Know About the Open Versus Closed Software Debate https://www.nytimes.com/2024/05/29/technology/what-to-know-open-closed-software.html
46 Forbes (2024) The Real Value of Open Source: Saving Time and Money https://www.forbes.com/2024/02/15/real-value-of-opensource-saving-time-and-money
47 OpenUK (2023) State of Open: The UK in 2023 Phase Two: Part 1 https://openuk.uk/wp-content/uploads/2023/07/FINAL-State-of-Open-The-UK-in-2023-Phase-Two-Part-1.pdf
48 CNCF (2023) CNCF Annual Survey 2023 https://www.cncf.io/reports/cncf-annual-survey-2023/
49 Linux Professional Institute (2024) 2024 Open Source Professionals Job Survey Report. https://www.lpi.org/2024-open-source-professionals-job-survey-report/

aligns with the broader trend of fostering a culture of open source. By providing these opportunities, organisations not only enhance their employees' skills but also contribute to the overall competitiveness and agility of their operations. The ability to attract and retain top talent through strong open source policies and training initiatives is therefore a key driver of economic growth and innovation[50].

2.6 Measuring growth

2.6.1 The UK and Department for Science, Innovation and Technology

Additionally, assessing economic impacts like cost savings and increased market competitiveness due to open source adoption offers tangible measures of how these practices translate into financial benefits for organisations[51].

In the UK, the Department for Science, Innovation, and Technology ('DSIT') is focused on leveraging these economic benefits by fostering growth through digital and technological innovation.

In 2024, DSITs emphasis on areas such as digital services, cybersecurity, and AI highlights its commitment to supporting the open source ecosystem. By promoting widespread participation in digital projects and creating policies that drive digital transformation, DSIT aims to enhance collaboration and develop cost-effective solutions accessible to all. This approach not only accelerates innovation but also reduces costs, supporting long-term sustainability and competitiveness in the tech-driven economy.

DSIT's initiatives align with boosting the open source economy by integrating technology with economic policies to strengthen the UK's global position[52].

2.6.2 Cloud Native Adoption in the UK

In the UK, the adoption of Cloud Native technologies and open innovation practices has been relatively strong compared to other regions. The UK's tech sector has shown a keen interest in integrating these technologies to maintain its competitive edge in the global market. The UK's position as a leader in digital transformation is supported by government initiatives aimed at fostering innovation and reducing the barriers to technology adoption. This proactive approach helps the UK mitigate the challenges seen in regions like APAC, ensuring that it remains at the forefront of technological advancements and economic growth[53].

2.6.3 Regional Trends in Open Source Software Adoption

Understanding regional trends is crucial for identifying the challenges and opportunities that exist in various markets and how these dynamics impact global competitiveness. For example, The 2023 CNCF Annual Survey highlights a significant regional disparity in the adoption of cloud-native technologies, with the Asia-Pacific region lagging behind North America and Europe. Specifically, while 64% of organisations in the Americas and 61% in Europe have integrated cloud-native practices into their development and deployment processes, only 30% of organisations in APAC have done the same. This gap underscores the challenges faced by APAC in transitioning to cloud-native technologies, which are crucial for driving innovation and competitiveness in the global market[54].

50 Linux Professional Institute (2024) 2024 Open Source Professionals Job Survey Report https://www.lpi.org/2024-open-source-professionals-job-survey-report/
51 New York Times (2024) What to Know About the Open Versus Closed Software Debate https://www.nytimes.com/2024/05/29/technology/what-to-know-open-closed-software.html
52 Research Professional News (2024) DSIT Set to Become an Economic Department, Says New Minister https://www.researchprofessionalnews.com/rr-news-uk-politics-2024-7-dsit-set-to-become-an-economic-department-says-new-minister/
53 UK Tech Nation Report. https://technation.io/tech-nation-annual-report-pre-reg-2024/ and GOV.UK (2024) UK Government Digital Transformation Strategy. https://www.gov.uk/government/publications/uk-digital-strategy
54 CNCF (2023) CNCF Annual Survey 2023 https://www.cncf.io/reports/cncf-annual-survey-2023/

2.6.4 International Growth

The Open Source Initiative ('OSI')[55] suggests that regions like Africa, Asia, and Latin America saw the most significant increases in open source software usage, highlighting a shift towards a more globally distributed open source ecosystem. The report also suggests that the rise of Cloud Native technologies and Kubernetes has further shaped the open source landscape, with one in three organisations now deploying Kubernetes, representing a 10% year-on-year increase. The trend towards containerisation and microservices architecture has led to a market shift where these technologies are a dominant force in cloud computing ecosystems[56].

2.6.5 Competitive Advantage

The economic impact of embracing open source software can be substantial. By participating in and contributing to these projects, companies can reduce their software development costs and increase their operational efficiency. Furthermore, the collaborative nature of open source development allows businesses to benefit from the collective intelligence of the global developer community, leading to more secure, scalable, and innovative solutions. This approach not only fosters innovation but also ensures that companies can respond more rapidly to market changes, thereby maintaining their competitive edge in a dynamic global economy[57].

2.7 Under Threat: The UK's Position as Number one in Open Source in Europe

The UK has long held the title of number 1 in Europe, and continues to be positioned at number 5 globally. Despite the massive growth in GitHub accounts, seen in 2024 in the UK, by extrapolating the data in the Octoverse 2024[58] report from October 2024 - which looks forward to 2028. If the growth trends continue at the present rate, depending on the measure, Germany may overtake the UK in terms of the number of developers working on collaborative open source projects by 2030.

When we look at AI, the number contributing code to GenAI based projects in the UK is currently behind France and Germany. If you look at the numbers of people contributing to GenAI communities (i.e. include folks working in Issues / Discussions etc not just code) then the UK fairs better but remains behind Germany, according to GitHub data.

Looking to the Tortoise Index[59], the first report to benchmark nations on their level of implementation, innovation and investment in artificial intelligence, the UK slipped behind Singapore into 4th position and retained this position in September 2024. However, France overtook the UK when it came to "open source AI" and the UK slipped into 5th place[60]. French generative AI start-ups attracted $965 million of private funding this year – six times more than in the UK. In explaining the reasoning for this, Tortoise state "France has developed an advantage specifically in the field of open source generative AI."It goes on to explain that "Of the top 200 most powerful open-source AI models released this year, 24 were developed in France, 41 in China and 65 in the US. Only four were developed in the UK – fewer than in Canada, Spain and Germany."

However it is clear that while this continues to grow, the UK's growth is currently being outpaced by its European neighbours, in particular when it comes to open source and AI, a market that the UK ought to have been well positioned to lead in Europe.

55 https://opensource.org/
56 2024 State of Open Source report, OSI, OpenLogic by Perforce and the Eclipse Foundation https://www.openlogic.com/sites/default/files/pdfs/report-ol-state-of-oss-2024.pdf
57 New York Times (2024) What to Know About the Open Versus Closed Software Debate https://www.nytimes.com/2024/05/29/technology/what-to-know-open-closed-software.html
58 GitHub (2024) Octoverse Report https://octoverse.github.com/
59 Tortoise AI Index (2024) https://www.tortoisemedia.com/intelligence/global-ai/
60 Tortoise (2024) AI: The French Connection https://www.tortoisemedia.com/2024/09/19/ai-the-french-connection/

3. Fireside Chat OCPP Open Standards and EV Charging

Lonneke Driesen
Open Charge Alliance

The Open Charge Alliance

Recently celebrating its 10th birthday, Open Charge Alliance ('OCA') is an organisation of about 15 employees, based in the Netherlands. It supports the electric vehicle ('EV') charging industry to accelerate its success and growth through the use of open standards.

One of OCA's founding members ElaadNL, developed the Open Charge Point Protocol ('OCPP') since 2009. It enables information exchange between a charging station and the back office.
Given the international adoption of OCPP, a new and international foundation was needed, to continue its governance with inclusion of more and international players and OCA was founded in 2014. Since then it has grown in size, in terms of the number of participants (from 30 to 400); the geographical area of focus (from the Netherlands, to global); and supported multiple OCPP versions. Today, with 10 years of history, OCA is still engaged in activities that were included in the initial deed of incorporation: development and promotion of the OCPP protocol, offering a certification program and developing a test tool.

OCA is funded through participants' fees, the sale of the OCPP conformance testing tool and a mark-up fee for individual conformance certificates

What motivates OCA?

The expedited adoption of EVs in recent years required to decarbonise transportation and stop climate change requires a good, affordable and ubiquitous charging infrastructure. This being interoperable is a prerequisite to expedite adoption of EVs. OCA believes that through working collaboratively on an open protocol we can develop better charging infrastructure, faster and more efficiently.

More about OCPP

OCPP handles the information exchange between an EV charging station and its back end management system. It handles a.o. charging sessions (start and stop charging), payments (using a token, bank card, QR code), manages the charging station itself (firmware updates, component monitoring) and controls the energy flows (charging speed, charging/discharging).

To ensure interoperability between different charging stations and management systems OCA offers a conformance testing tool, to check individual implementations and we host interop testing events 3 times a year.

When developing a new infrastructure, using an open standard results,due to its open nature, in the engagement and inclusion of multiple parties. These parties introduce competition into a market, which is good for price, quality, innovation and scalability. It's a state of cooperation where the parties compete and collaborate at the same time. So the market is shaped by openness that enables both collaboration and competition at one and the same time.

In a developing and turbulent industry, companies frequently drop out of the market. Because we have an open standard, other companies can pick up the stranded assets and continue their operation, which is a benefit we see from openness that is not often discussed.

OCPP has been adopted across the planet, apart from several networks that prefer to work with their own proprietary information exchange, as well as charging networks in China. In the UK some networks use OCPP, but not all and we would love to see the UK adopt it across the board. Clearly the openness of OCPP has shaped the EV Charging market.

What impact does OCPP have on the EV market?

It allows for companies to work faster and to save on development resources and costs, they can then spend that on something else and collaboratively benefit from the best innovations. They do not individually have to figure out the solution to a challenge faced by the market as a whole, e.g. how to transmit QR code information. Instead this has been done for them through the collaboration vehicle and each participant can rest assured that it will work with all other parties using OCPP in an interoperable way.

EV Charging station manufacturers can sell their stations to any Network Operator and Network Operators can choose from all charging station manufacturers that use OCPP. For both it will increase their market. And since OCPP is adopted globally, they can enter international markets capitalising on their domestic success.

We hope that this open standard will allow organisations to continuously engage and enable a multitude of players, both global and smaller local players to compete on an even playing field. This is critical to the sustainability of the planet and the transition to zero emission transportation. This needs local players to drive the change locally, benefitting local companies. Inclusion of local players is needed to move quickly and get everyone involved and embracing this transition. The openness of the standard and interoperability and collaborative innovation it enables is shaping the EV charging market but also shaping a more ecologically sustainable future.

How does OCA ensure that the protocol remains relevant and up to date with the latest technological advancements and market needs?

By listening. We listen to regulators, our participants, to the market in general. And then we quickly include these necessary features benefiting from the input of our participants, in an agile way.

What challenges have you faced while developing and updating OCPP?

For us, the decision to open up a standard was not difficult. The goal of helping the industry accelerate was clearly going to be best served by opening OCPP as an open standard. We knew this from day one.

Patent Threat

In EV charging, there were and still are a lot of companies filing patent applications. Some do this because they always have, some because a ‘patent wall’ is expected of them and others because of a defence strategy, some because they think it will make them rich. We just let them and continue with our open source standard strategy.

Years ago, the then US market leader in EV charging infrastructure lost out on a major contract in the public sector and subsequently filed a cease and desist order against the small company that won the contract. It took a year of costly litigation but fortunately that resulted in the dismissal of the market leader’s complaint by the US Supreme Court. One year after that, the market leader who had instigated the litigation joined the Open Charge Alliance and is now one of the biggest supporters of OCPP. Who would have thought!

The upside of this story is that we now know how to handle such a case. So should in future there be more IP claims, we are prepared and will know how to act. Patents are a challenge to open standards like OCPP and can adversely shape the market we are evolving in.

Building Corporate Communities and Collaboration

Generally, I think we have faced the same challenges around opening a standard and engagement as everyone else: how do you get people to contribute and not only consume when you openly share? How do you fund open source development? The US is more advanced in this funding than Europe and we have dealt with this through having a diverse group of participants. In theory we only need a couple of them to get the discussion started and over time they can see enough value to invest.

Some of the typical ‘consumers’ of openness then join in the discussion and gradually begin to help. It’s a journey. But inevitably there will always be parties that prefer not to share with others. As for the funding, we pay dedicated Technical Editors to do the actual ‘legwork’, using the participants’ fees – a way of socialising the cost of technical writing.

Support from the Open Ecosystem

Luckily we have had great help from the open source community: OpenUK, the Linux Foundation, Open Invention Network, the Joint Development Organisation and many others have supported our 10 year evolution. This is yet another aspect that is at the core of open source and open innovation: to support and help each other because it is the right thing to do. We are very grateful for what this has enabled and that collaboration and support from other organisations in the ecosystem has not only helped us to develop but shapes the market in openness. The more successful organisations there are in open source and open innovation, the more new ones will form and the greater the chance that they will succeed.

In terms of public sector adoption, the challenges depend greatly on the country. For example, South Korea and the US are quite effective in adopting an open standard, moving quickly and pragmatically. India is also very pragmatic in its adoption of open standards. The European Union is quite bureaucratic, their decision making process is anchored in laws and procedures, aimed at achieving long term agreement and predictability but this makes them slow. In a new and quickly evolving industry, these bureaucratic procedures favour the ruling class and the market is slow to adapt, so the bureaucracy has a major impact on the success of an agile and open innovation like OCPP. The ruling class either doesn’t want to change at all, or at the very least wants to control its speed and direction. In our case, the ruling class in automotive is Germany and they have asked the EU to reject OCPP as an open standard. We hope the EU will instead listen to all other European countries that do support OCPP. The market in the EU will certainly be shaped by their response to the ruling class, the establishment, to change.

Is there anything else you would like to add?

I want to thank the open source community, for your example inspires others to follow the same path. You show what is possible and you are willing to help others out selflessly. The impact that you have on society is way bigger than you may realise. We are very proud to be a part of this!

4. Market Factors Shaping Open Source Adoption

4.1 Background

Market infrastructure is designed to support the status quo. The challenges faced by open source software's market entry are primarily caused by the difference between open source and proprietary code such as licensing, distribution models, associated business models, maintenance and curation. This is a mix of factors specific to open source software and those of the functioning of the established marketplace.

A user buying a proprietary software product and support has little engagement with the code and may also have little need to understand the service delivered, a user of open source software, is provided with code that may then need their engagement.

Whilst the challenges described in section 4.2 are around understanding and are open source specific, many of the factors that shape the open source market also shape the digital market as a whole and are not specific to open source and are explored in 4.3.

4.2 Open Source Specific Challenges

4.2.1 Background

Distributed 'free of charge' without royalty payment open source was not designed to generate revenue or be the basis of a business model. It evolved as a socio-political movement, a reaction to the closed source proprietary software distribution model which was perceived by certain software engineers to inhibit their collaboration. They actively rejected royalty-based-software distribution and the restrictions of its licensing which focused on monetising the 'secret sauce', i.e. the human readable source code. In opening code and sharing their outputs they sought to enable collaborative creation and development of software to enable it to solve a known challenge. By collaborating on the solution 'many eyes made bugs shallow'[61].

4.2.2 Scratching the infrastructure itch

'Every good work of software starts by scratching a developer's personal itch'[62]. Scratching a software engineer or developer's itches has led to open source software outputs that are often infrastructure and developer tool focused - the plumbing of our digital infrastructure. Enabled to 'stand on the shoulders of giants' by recycling and reusing software rather than building from scratch. This saves significant amounts of time and money whilst building state-of-the-art innovation, with the potential to be interoperable and remove lock-in.

Open source software may generally be considered to be 'deep tech' unseen by those who do not directly interface with the code itself. Its success is very dependent on how it is done. In some environments despite the open source code sitting underneath, moving providers may be difficult due to charges such as egress fees, and the sheer complexity of moving vast amounts of data between non-identical systems.

61 Linus's Law, Wikipedia, https://en.wikipedia.org/wiki/Linus%27s_law
62 Eric Raymond, The Cathedral and the Bazaar: Musings on Linux and Open Source by an Accidental Revolutionary

4.2.3 A Tech Pizza Base

The analogy of a pizza may help[63]. If tech is a pizza, then AI, ML, Cloud, Internet, BlockChain are all toppings. When people go to a pizza restaurant they choose the toppings based on their personal preference. They may have a preference for and an opinion on pepperoni or pineapple. Only a few aficionados discuss the pizza's base. It isn't interesting to most and often there is no or little choice. Without the base what is left will be a sloppy mess and the toppings are unappetising. Open source software is the base of all digital infrastructure today and without it that infrastructure would be a sloppy mess.

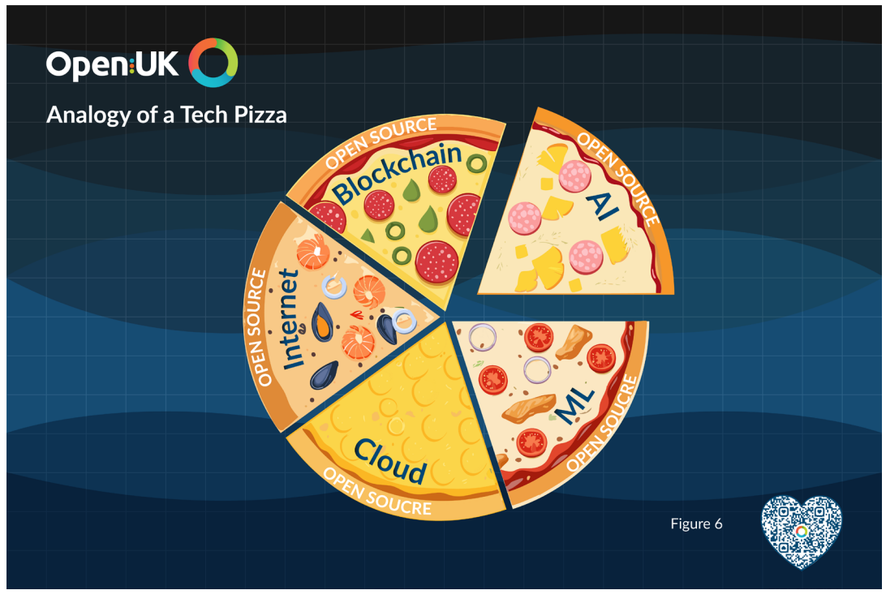


Figure 6

4.2.4 Understanding Open Source and Misconceptions

Open source is many things to many people. And their view may depend upon how they first experienced it, e.g. as an individual community contributor to a hobbyist project scratching an itch, or as an employee collaborating around the build of a project in a foundation.

Legal definitions of open source software tend to focus on it being code with the source code publicly shared (generally achieved by sharing it on GitHub or another public repository) and which is distributed on an open source software licence that meets the OSD or meets the OSD and is approved by the OSI. This latter requirement enables certainty. In reality open source is an awful lot more than that legal definition. An open source project is unlikely to succeed if it merely meets the definition.

In reality it is a complex mix of software with its human readable source code shared, legal rights (including intellectual property) and people. Inevitably this requires deep technical and legal/governance understanding and expertise which is then overlaid with managing people and understanding interaction with them managed by community expertise.

63 The Tech Pizza analogy created by Amanda Brock

Many experts in 1 of the 3 disciplines have a good understanding of the other elements, but to curate open source well, experts in all 3 areas must collaborate closely to manage dependencies and overlapping challenges in the build, distribution and ongoing maintenance of sustainable software.

Perception in some ways matters more than reality and perception of open source can be damaging and detrimental. Common misconceptions include 'The Wild West'. Whilst anyone can create open source only good well managed open source is likely to be adopted. Successful open source projects are utilised at scale by large companies and have organisational and governance structures around this in the main. Although open source licences almost universally seek to exclude liability, this provision whether stated (as it is in many licences) or not, is enforceable only to the fullest extent permitted by law. Applicable law trumps licence. The image of a 'Hippy Developer in a Basement' remains popular but a mythg as, the open source community, includes large numbers of paid, and in many cases highly paid individuals employed by major corporations contributing on their behalf.

4.2.5 Fear Uncertainty and Doubt

A lack of detailed understanding not only means failed projects but also that incumbents in disrupted sectors are able to fight back against an open source challenge spreading 'Fear, Uncertainty and Doubt' ('FUD'). As the recipients of information lack the detailed understanding needed to discern between what is correct and true and FUD, spreading FUD has always been too easy a response to the open source challenge.

4.2.6 Open Washing

When companies distribute code as open source they effectively enable their competitors with their own innovation and funding. This is not easy. A consequence of this is that organisations may describe their code as open source when it is not thereby obtaining the benefits of open source without living up to its requirements.

The New York Times published a discussion on 'open washing' in the context of AI[64], and whilst the term has been pushed into the mainstream in the context of AI, the meaning transcends sectors and spans digital environments. Open washing is where a company states something is open source when it is not as it does not meet the 'standard' of open source. This is generally done to reap the advantages of open source adoption at pace. The mis-described software is generally distributed under a licence that does not meet Definitions 5 and 6 of the OSD requiring that anyone may use the code for any purpose. Often a commercial restriction will have been applied enabling financial gain or in some cases the restriction may be ethical or political.

'Open washing enables companies to capitalise on the positive perception of open source and open practices without actually committing to them. This can help improve their public image and appeal to consumers who value transparency and openness. Some corporations use open washing to shield their models and practices from scientific and regulatory scrutiny while benefiting from the "open" label.'[65]

64 New York Times (2024) What is open washing https://www.nytimes.com/2024/05/17/business/what-is-openwashing-ai.html
65 The Reg (2024) The open secret of open washing - why companies pretend to be open source https://www.theregister.com/2024/10/25/opinion_open_washing/#:~:text=Open%20washing%20enables%20companies%20to,who%20value%20transparency%20and%20openness.

4.2.7 Generational Engagement in Open Source and User Understanding

Many users and even contributors have limited knowledge despite engagement in open source. Participants can be seen to span 'three generations of open source engagement' which are not based on age, but correlation to the route to engagement in open source.

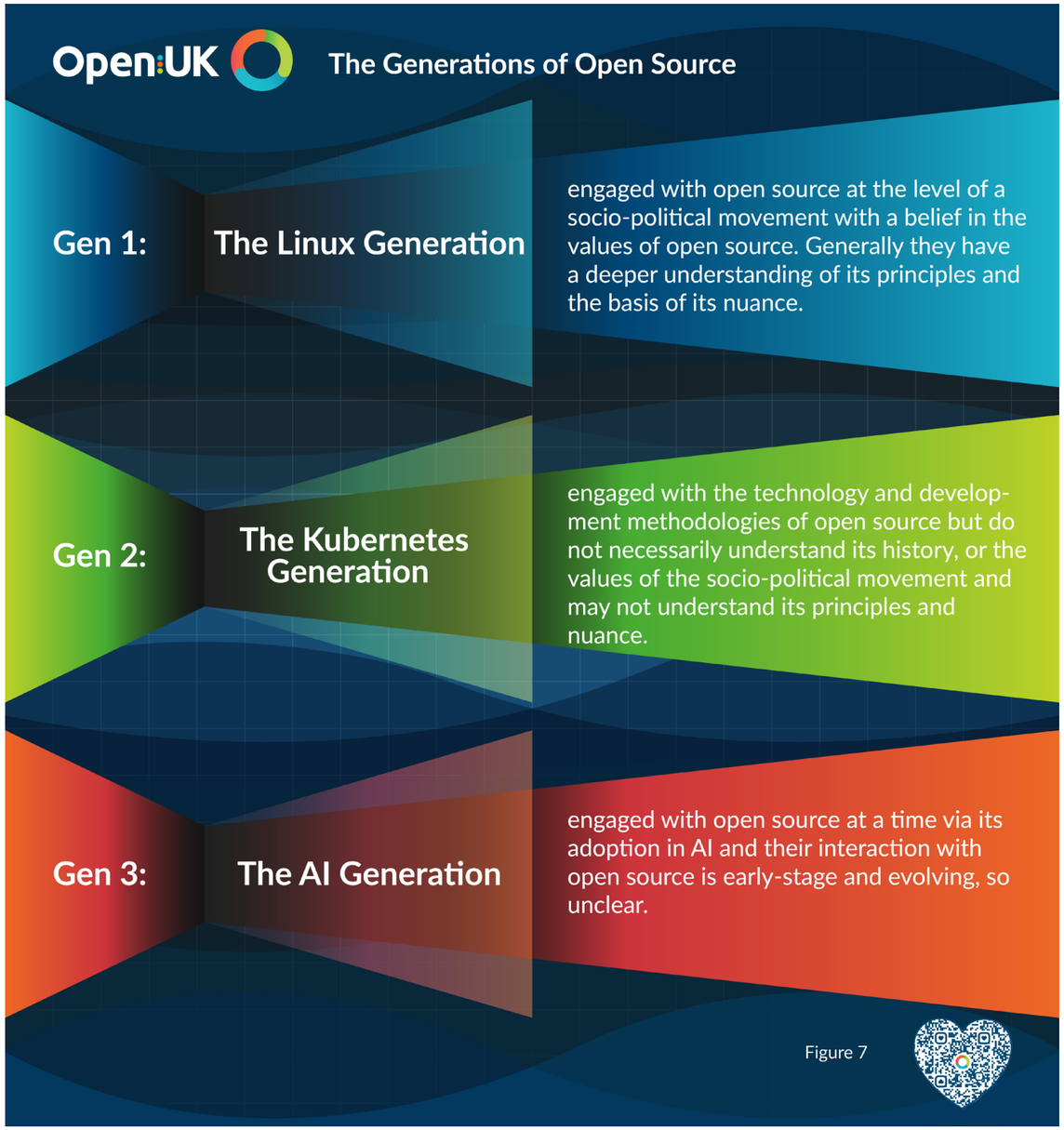


Figure 7

4.2.8 Total Cost of Use

Whilst free from royalties, open source is not free to use. There is a 'total cost of usage', costs incurred in implementation, integration, maintenance and funding the longevity of the projects whose outputs are used.

Enterprises frequently identify a challenge in using open source due to its 'hidden costs'. This includes costs like memberships of foundations to be a part of the contributing community. Often no budget is allocated to open source.

4.2.9 Community and corporate engagement

'Community' evolved as a term of art referring to both individual groups of developers and the ecosystem of people needed for an individual project's success and for the collection of these communities.

Initially individual hobbyists, over the last decade the term 'Community' today encompasses a vast proportion of corporate contributors working for international companies (including the Big Techs) who collaborate around software development. Many contributors are staff who are paid by their companies to participate in the key communities. This participation allows many things, contribution, skills development and influence in the products those companies use. They join key projects set up by individuals and consciously build out projects needed to fill gaps. Collaboration is generally well funded and formal with structure and governance, but there are still some smaller projects run (maintained) by individuals.

> 'This community collaborative approach builds the community faster, encourages sharing and collaboration and delivers high quality, rather than everyone trying to do their own thing,' Lord Maude[66]

The significance of corporate 'co-creation'

Understanding open source requires an understanding that anyone can use the code for any purpose. Open source is made freely available on an open source licence - one approved by the OSI to meet the Open Source Definition[67] - which will enable anyone to use the code for any purpose. The licence on which the code is distributed is simply the set of terms on which the code creator enables others to use the code, and is of course subject to applicable laws. Those laws may be international, not just the laws of the country from which the code is distributed. If the code is distributed into the EU the new Cyber Resilience Act may apply.

66 Computing interview with Lord Maude at COP26, https://www.computerweekly.com/news/252509566/COP26-Lord-Maude-on-how-open-source-could-help-in-the-fight-against-climate-change
67 https://opensource.org/osd

If successful, the software is adopted at scale via distributed working platforms like GitHub and Gitlab. At its best, an open source package becomes a de facto standard across a sector and enables 'co-opetition'[68] to exist. In a recently transformed digital world, all services and products are created, distributed and/or consumed digitally. Software underlies all of this digital environment and the needs of every organisation, whether private or public sector.

The UK is one of the world's most significant GitHub users. We see in October 2024, the UK, having hit 3 million users in January 2024, having 4.1million GitHub accounts. This figure translates to a per capita 6.12% of the UK population holding a GitHub account. The UK continues to be the home to more GitHub account holders than any country in the world. The number of GitHub account holders is not an exact equivalent to open source software development and contribution but it is a central figure in calculations of cost of creation and value generated by open source.

A Community Voice - Being in the room and access to decision makers

By its nature the open source community is not cohesive and has many parts, little funding and few with the skills to represent it and its interests in the policy world. It is often under-represented in critical discussions as a consequence of this.

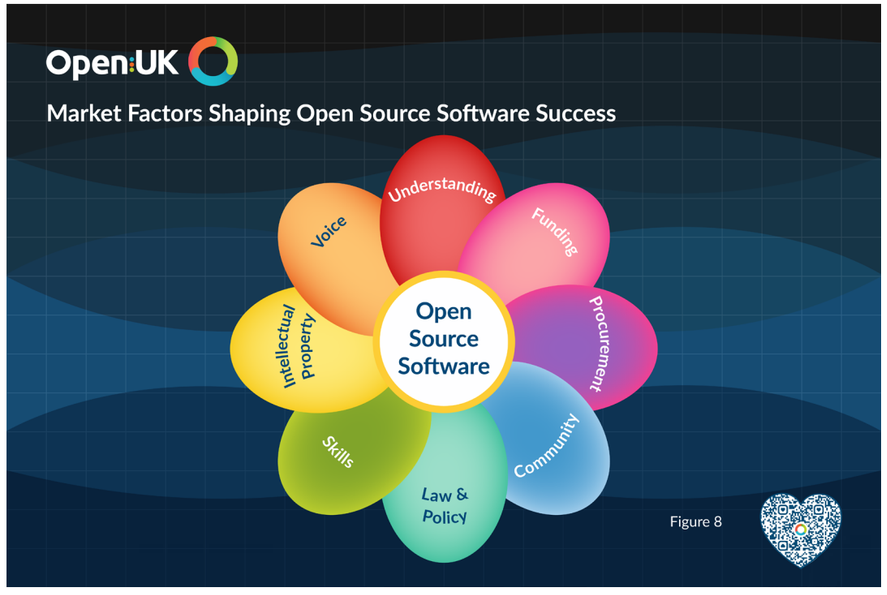


Figure 8

4.3 Market Shaping Factors in the Digital Economy

4.3.1 Law and Regulation

Pro Open Source Law and Policy

A key factor in shaping a market is the role played by a law or policy which takes a pro-open-source stance and is not impactful on its own. To achieve meaningful open source adoption requires not only appropriate law and policy but appropriate processes and structure across the ecosystem, including adapting existing market factors to enable its success.

68 https://en.wikipedia.org/wiki/Coopetition

In 2024 we have seen Switzerland introduce new law requiring open source in its public sector:

> 'Switzerland's new 'public money public code' law is a great opportunity for the government, the IT industry and society. All stakeholders benefit from this new regulation since the public sector can reduce vendor lock-in, companies can grow their digital business solutions, and taxpayers spend less on IT solutions and receive better services due to increased competition and innovation.' Professor Dr. Matthias Stürmer[69]

Only a year prior to this new law, the city of Bern was reeling from a massive financial loss where an open source project in schools went badly wrong. In this instance the processes in question were not specific to open source and whilst the procurement process was validated in the ensuing enquiry, the processes utilised in the implementation of the project were not in line with good market practices.

The UK's world-leading open source first policy dates back to 2011. During the last 14 years UK-based open source companies have continued to struggle to gain funding and contracts within the UK public sector. In 2023, Palantir won a £480m contract to manage the UK's NHS, the biggest healthcare organisation in the world's data, in a competitive tender including a UK consortium with open source based companies[70] despite the NHS having a pro open source policy in place.

> 'Today, open source has led to the creation of some of the world's most valuable technology companies… These are indications that open is now [something of] value.[71]' Lord Maude

A Regulatory Burden

Regulatory burden is demonstrably increasing as governments and law makers come to terms with digital infrastructure. This brings new risks which somewhere in the supply chain must bear and take liability for. Managing that in today's software ecosystem requires understanding of both proprietary and open source software, not just of code and how it works, but of the software environment and the factors that shape it and how these can benefit and hinder the adoption and evolution of both types of software.

Open source software may be created by individuals and shared whether by individuals or companies at no cost, and so expectations on the reasonable burden of liability that such distributors should bear may be very different.

69 European Commission,Interoperable europe https://interoperable-europe.ec.europa.eu/collection/open-source-observatory-osor/news/new-open-source-law-switzerland
70 British Medical Journal, Palantir wins £480m contract to manage NHS Data https://www.bmj.com/content/383/bmj.p2752
71 Computing interview with Lord Maude at COP26, https://www.computerweekly.com/news/252509566/COP26-Lord-Maude-on-how-open-source-could-help-in-the-fight-against-climate-change

The long standing proprietary model and its conditions are well understood. In the case of open source, this relatively young space may be considered as the teenager on the block. Understanding both direct and indirect consequences of regulation and market shaping is relatively new to those responsible for this. And, like most teenagers, it's complex.

The EU Cyber Resilience Act ('CRA')[72] has been described as having a 'chilling effect' on open source. A series of legislation from the EU including the CRA, The Product Liability Directive and the EU AI Act have been accused of failing to understand open source and having a detrimental impact on it, particularly with respect to individual developers and small innovators.

Never before have digital arenas been under greater scrutiny by governments and areas like cybersecurity are likely to continue to increase the burden on open source contributors and the maintainers of open source projects.

International Legal Impact and GeoPolitical Shift

Distributors of open source software may be subject to laws in the country in which they are based and in which the software was created but also to international laws in locations to which it is distributed. In effect any country in which the code is legally downloaded and has not been blocked. In 2024 both Apple and Meta, US companies, chose not to distribute new digital products into the EU to escape the uncertainty of its new digital laws that they did not wish to be subject to.
The chilling effect of law is not only coming from the EU, the US also exercises a long arm reach. A recent exclusion of a group of Russian software engineers from maintainership in the Linux Kernel[73] is apparently attributable to US Sanctions against Russia apparently applicable to the Russian employers of the excluded group. Geopolitical shifts may have a detrimental impact on open source's global collaborative basis.

4.3.2 Intellectual Property and Standards

Patents

Patents intentionally grant a monopoly right over an idea to reward innovation, but their royalty bearing licensing sits in friction with the free flow essential to open source software. The collective open source response has been a defensive approach with organisations like Open Invention Network ('OIN') (the biggest defensive IP organisation in history) offering patent cross licensing and a 'hold harmless' effectively creating a no-fly zone for patent enforcement against open source.

While many in open source reject patenting and hope to rely on the openly visible nature of their prior art, organisations including Red Hat have actively registered patents with a defensive stance and made them available to community through OIN and negotiated settlements with patent aggressors for the benefit of the entire community.

The Rockstar Consortium purchase of Nortel's patents was investigated by the US Department of Justice[74]. The outcome of the DoJ investigation was that these patents were made subject to an OIN licence. 'Pretty much anybody out there is infringing,' says John Veschi, Rockstar's CEO. 'It would be hard for me to envision that there are high-tech companies out there that don't use some of the patents in our portfolio.'[75]

72 TechCrunch (2023) Cyber Resilience Act Chilling effect on open source https://techcrunch.com/2023/04/18/in-letter-to-european-commission-open-source-bodies-say-cyber-resilience-act-could-have-chilling-effect-on-software-development/
73 Computing (2024) Russian Linux Kernel Maintainers Blocked https://www.computerweekly.com/news/366614656/Russian-Linux-kernels-maintainers-blocked
74 Department of Justice, Nortel patent acquisition https://www.justice.gov/opa/pr/statement-department-justice-s-antitrust-division-its-decision-close-its-investigations
75 Wired, How Apple and Microsoft Armed 4000 Patent Warheads https://www.wired.com/2012/05/rockstar/

Standards

Whilst open standards can be seen to work well with open source, closed standards may incorporate patents on a Fair Reasonable and Non Discriminatory royalty licensing basis. Unfortunately these licences' royalty means that even FRAND licensing is in friction with open source's free flow.
Standards are also being used at scale by some legislators including the EU in implementation of laws. The recent Malmoud case in the EU, found that access to harmonised standards for natural or legal persons in the EU is justified due to an overriding public interest, as they form part of EU's law and removed the practice of charging for these[76]. Representation of open source communities can be seen to be a particular problem in the standards making process and this is a greater challenge as laws are increasingly implemented via standards. To be part of the standards process may require membership of standards bodies, the ability to employ expensive standards experts and to travel to international face to face meetings. There is a real and present danger that open source will not be properly represented or taken into account in these processes

4.3.3 Access to Funding

Private Funding

In 2023, the UK saw $21.3bn raised in VC funding, while $50.2bn was raised by UK Headquartered funds[77]. OpenUK's State of Open: The UK in 2023, Show us the Money report, organisations in the UK have experienced significant challenges in securing funding for open-source-based businesses due to lack of experience and understanding. This can make scaling open-source-based businesses in the UK more challenging, while funding is readily available for this sector from Silicon Valley.

A lack of understanding of open source has restricted funding from the UK into UK-based open source businesses and they instead look to Silicon Valley for funding. This is not a UK specific phenomenon but also true of EU start ups. Categorised as 'deep tech' open source software provides the infrastructure of the digital economy. Its capacity to be reused and recycled allows businesses to build, particularly SaaS products on top of it without users even understanding they are users.

The UK has not to to date played a significant role as an investor in this space and this has inhibited scaling in the UK and led to companies either selling out to the US or taking US investment and transitioning to US Delaware corporations due to requirements from their Bay Area investors. Silicon Valley investors understand open source and the potential for businesses built on it to become billion dollar unicorns. Many have experience of divesting their own open source businesses or having invested successfully in these in the past.

In short the UK challenge is that funders take risks which must be understood and do not gamble. If there is not deep knowledge of the sector and there has not been open source, then there will not be funding at scale.

State Aid

To achieve public policy objectives successfully may require that initiatives are funded by State Aid. State Aid is 'a term that refers to forms of State-controlled financial resources, given to Undertakings on a discretionary basis and where the funding may give the organisation a competitive advantage or distort the market. Certain State Aid has been historically provided requiring open source outputs but even where this is the case many open source organisations have failed to secure that funding and the organisations which have secured funding have failed to deliver open source that achieves the public sector's goal in funding open source development of creating code which is recycled and reused and which will become sustainable software.

A lack of understanding of open source leads to criteria for funding of open source that is too narrow and simply requires the legal definition of open source be met in the outputs of funded organisations. This narrow definition as an approach leads to code being dumped on GitHub with an open source licence which is not adopted nor has a community formed around it and which does not have a sustainable future.

To enable open source success requires greater understanding of open source in the public and private funding sphere, enabling private investors to be more willing to invest and public sector investment to create true open source bringing the benefits of open source including removing lock-in and creating code that will be adopted at scale.

Maintenance

Innovation is the focus of funding, but software has an ongoing life and maintenance needs to be funded as well as innovation. Open source may be seen to be in crisis as it evolves and relies on free resources to maintain critical code.

4.3.4 Procurement

Processes and Terms

Open source is often adopted in both enterprise and public sector environments in the belief that it will break vendor lock-in when software that is procured and create code that will be recycled and reused when new code is commissioned. This can of course be the reality, but achieving that reality depends on a number of factors being met.

Procurement processes and vendor qualification may need to be adapted to suit open source as well as proprietary entities. Open source organisations may well be SMEs and may have a globally based workforce without an identifiable location of a critical mass. Those assessing the projects must understand open source.

Incumbent positioning may also be seen to be an insurmountable barrier to entry.

Contracts will not be needed at the point of usage and risk management at the point of software entry into an organisation may shift from contracts to policies and procedures applicable to the engineering team. Contracts will be entered into at a later stage for support, subscription or add-on services and will not include a software licence as the code is distributed on its own standard licence. Royalty free open source distribution may not fit within the approach to commercialisation in a contract's structure. So the suitability of the form of contract must be considered, then within the contract the appropriateness of its terms, for example, warranties and indemnities appropriate to royalty free software distribution will not match those of a proprietary transaction.

As has been discussed, reliance on an understanding of a legal definition alone will not achieve good results and a broader approach to what open source will mean is essential, to enable contribution and longevity.

76 CJEU, Malmud https://curia.europa.eu/juris/document/document.jsf?text=&docid=283443&pageIndex=0&doclang=EN&mode=req&dir=&occ=-first&part=1&cid=288763
77 https://technation.foleon.com/research/tech-nation-report-2024/#:~:text=The%20Tech%20Nation%20Report%202024&text=Discover%20the%20investment%20data%20and,in%20the%20age%20of%20AI.&text=%E2%80%9CThe%20UK%20tech%20sector%20reached,in%20our%20remarkable%20growth%20story.%E2%80%9D

OpenUK's Future Leaders Group conducted a review of the UK Cabinet Office Procurement Terms and the issues flagged in this report may be seen to be relatively universal.[78]

Insurance and Risk

Many risks require insurance under a contract but insurance may not be available in the market for open source software. Larger entities may manage this by self insuring with the effect that smaller entities who are unable to purchase this may be precluded from the market or forced to sign contracts with risks which they may not be able to stand behind.

Financial Structures

Proprietary software may be acquired using capex funding which is not suitable for a royalty free model and if it is not possible to obtain opex funding within an organisation this may inhibit open source adoption.

Management Understanding and approvals

If management are not well versed in open source they may not understand the issues to the level necessary to give approvals.

4.3.5 Skills

A key factor in the use of open source is the potential need to have skilled resources to manage the software. This may be very different from proprietary software. A lack of suitable skills and understanding within organisations may preclude open soure's successful adoption.

4.4 Conclusion

Open source software's success is dependent on building awareness and understanding to enable appropriate market interventions to shape market factors so as to facilitate that success. This may require pro-actve intervention and change to existing practices based on understanding of its particular characteristics and the delta between open source and proprietary software.

78 OpenUK Future Leaders Public Procurement Review, chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://openuk.uk/wp-content/uploads/2021/03/OpenUK-Future-Leaders-Review-for-comment.pdf

5. Case Studies

5.1 UK AI Safety Institute's Inspect Testing Platform

Department for Science, Innovation, & Technology

J.J. Allaire
DSIT

The Inspect Platform is a groundbreaking open source initiative developed by the UK AI Safety Institute to foster collaboration and innovation in the field of AI safety testing, particularly within the public sector. Its main purpose is to create a technical infrastructure that enables collaboration among researchers, safety organisations, governments, and frontier model providers. By making safety testing tools and methodologies more widely accessible, Inspect Platform plays a crucial role in enhancing the robustness and transparency of AI models, especially those deployed in critical areas such as national security, cybersecurity, and biosecurity.

Catalysing Global Collaboration through Open Source

Open source is at the core of the Inspect Platform, enabling it to achieve a level of global collaboration that would otherwise be unattainable. The decision to adopt an open source model was driven by the need to build trust and encourage widespread participation. The Platform's MIT licence ensures that its tools and methodologies are freely available, promoting transparency and fostering a sense of shared ownership. This approach has significantly lowered the barriers to entry for organisations and researchers who want to contribute to or utilise the platform, thus creating a diverse and engaged community.

One of the primary benefits of the open source model is that it facilitates the continuous improvement of safety testing methodologies. By involving a wide range of contributors – including those from other organisations – the platform has been able to evolve rapidly in response to the needs of the AI community. This collaborative approach has led to the development of robust evaluation frameworks that are more comprehensive and reliable than those created in isolation. This approach not only encourages participation but also positions the Institute as a thought leader in AI safety, influencing the standards and practices that other players in the market follow.

Addressing Global and Emerging AI Safety Challenges

The Institute addresses a range of high risk areas of AI, including cybersecurity, chemical and biological risks, and the autonomy of AI systems. These evaluations focus on the models' capabilities in potentially dangerous scenarios, such as using AI for offensive cybersecurity operations or extracting complex biological information. By addressing these concerns, the Institute plays a vital role in shaping how governments and industries approach AI regulation and safety.

One emerging area the Institute explores is the ability of AI models to self-improve which could eventually lead to evasion of human oversight. While this topic is still somewhat speculative, its inclusion in safety evaluations shows the Institute's forward-thinking approach, addressing potential long-term risks that may influence future market dynamics. By setting the agenda for discussions on risks such as this, the Institute shapes public and industry discourse around AI safety, ensuring that key risks are not overlooked as AI technology progresses rapidly.

Building Trust and Legitimacy

Trust is a critical factor in the adoption of any new technology, especially in the public sector. The open source nature of Inspect helps build this trust in multiple ways. First, it allows independent researchers and institutions to review and validate the platform's methodologies and results. This transparency is crucial for gaining the confidence of policymakers and other stakeholders who may be sceptical of AI technologies. Second, the collaborative development process ensures that the platform evolves in response to the needs and feedback of its diverse user base. This participatory model not only improves the platform's functionality but also reinforces its legitimacy as a tool that serves the broader community, rather than the narrow interests of a single organisation.

Conclusion

Inspect exemplifies how open source principles can be leveraged to address complex challenges in AI safety, particularly in the public sector. By fostering collaboration, enhancing transparency, and building trust, the platform is setting a new standard for how governments and other public institutions can responsibly engage with advanced AI technologies.

5.2 OpenEHR

Rachel Dunscombe
CEO, OpenEHR

OpenEHR is redefining the healthcare data landscape by leveraging open source software to create a standardised, interoperable data model that addresses one of the health industry's most pressing issues: data inconsistency. The company's mission, as with the King's College project in our last report, is to combat the fragmentation of clinical data, which has historically impeded effective healthcare analytics and AI applications, by making clinical data more accessible and interoperable. OpenEHR's commitment to open source principles has not only solved critical data challenges but also reshaped the healthcare market, enabling global collaboration and innovation.

The Role of Open Source in Healthcare Innovation

An open source approach is central to OpenEHR's success and impact. By licensing its data model under a Creative Commons licence and its software platform under an Apache 2.0 open source software licence, they have empowered a global community of clinicians, engineers, and researchers to contribute to and benefit from their standardised data framework. This collective effort has enabled the creation of a robust, peer reviewed system that can adapt to the complex and evolving needs of the healthcare sector.

OpenEHR's open source platform coupled with open data supports interoperability across various healthcare systems, making it possible for different providers to access and share patient data seamlessly. This is vital in a sector where data is often siloed and unnecessarily hindering patient care and research.

Market Impact

OpenEHR's open innovations are beginning to have a transformative impact on the healthcare market. Traditionally, healthcare data has been fragmented, stored in disparate systems, and recorded in inconsistent formats, making it difficult to use for research, analytics and patient care. OpenEHR's standardised data model has the potential to address these problems, reducing dependency on proprietary systems that often lock data in inaccessible formats if widely adopted. Additionally, it allows smaller healthcare providers to adopt high quality data standards without the prohibitive costs associated with commercial solutions. For example, the adoption of OpenEHR's model in Catalonia has led to fully integrated national healthcare records, significantly improving the efficiency and quality of care.

In the UK, OpenEHR's data model underpins parts of the NHS, providing a consistent framework for patient data across different regions and systems. This widespread adoption illustrates the scalability and versatility of OpenEHR's open source solution, which can be customised to meet the specific needs of diverse healthcare environments is a critical factor in the shaping of the software and data markets in the NHS and a broad adoption will be essential in shaping the NHS and healthcare market in the UK.

Enabling Global Collaboration and Research

One of the biggest impacts of OpenEHR's open source model is its facilitation of global research and collaboration. By creating a standardised framework and thereby more consistent data, OpenEHR have made it easier to conduct large-scale studies and share findings, and have enabled more accurate and reliable AI models, which are crucial for research in areas like rare diseases and personalised medicine.

OpenEHR is currently involved in a collaborative study in Germany to analyse the impact of data quality on AI performance in healthcare. This research aims to provide empirical evidence of how standardised data improves AI accuracy and safety, potentially setting new benchmarks for the industry.

Challenges and Future Directions

Despite OpenEHR's successes, their work is not without challenges. The company relies heavily on in-kind support from tech companies and universities, which poses sustainability risks in terms of maintenance and management - curation - of its outputs. To address this, OpenEHR are implementing a conformance testing program that will certify organisations for compliance with its standards, generating a new revenue stream, enabling them to pay for their own excellence and future maintenance and ensuring that organisations claiming compliance with their standards are genuinely adhering to them. Despite facing resistance from traditional standards bodies, which are often sceptical of community led initiatives, OpenEHR have made significant strides, gaining membership in key international organisations. While this shows that open source, community developed standards can be just as rigorous and effective as those developed through more conventional means, it is yet to be seen to what extent this has been realised within the UK.

Conclusion

OpenEHR's open source software and open data have revolutionised the healthcare market by providing an accessible, scalable solution to the complex problem of data fragmentation. Through global collaboration and a commitment to open standards, OpenEHR is not only improving patient care but also setting the stage for the future of healthcare innovation. As the sector continues to evolve, the company's open source approach will remain a critical driver of change, enabling a more interconnected and effective global healthcare system.

While OpenEHR has made significant strides in addressing healthcare data inconsistency worldwide, there is still a long way to go for the UK. Data fragmentation remains a persistent challenge, with different NHS Trusts and regions continuing to use a variety of legacy systems that often fail to fully integrate with modern open source frameworks. Until these gaps are bridged, the true potential of open source platforms such as this will not be fully realised. But with important steps being made by organisations like OpenEHR, the future of healthcare data management is hopeful.

5.3 British Library

Neil Fitzgerald
Head of Digital Research

Open source software is playing a critical role in enhancing market share, driving innovation, and fostering collaboration in the evolving digital landscape of the GLAM sector (Galleries, Libraries, Archives and Museums). A prominent case in point is the British Library, which is embracing open standards and open source software as core components of its mission to make collections increasingly accessible to others. Their work highlights how engagement with open approaches is helping to expand their influence and relevance in the digital age, solidifying their role as leaders in the digital knowledge economy. Neil Fitzgerald, Head of Digital Research, explains the role of open approaches at the British Library.

Expanding Market Reach Through Open Source

Libraries are tasked with not only preserving knowledge but also making it accessible to diverse audiences and in recent years, digital collections have become a key part of this mission. The British Library's corporate strategy focuses on this goal, aiming to make their own digital collections more accessible for research, creativity and public engagement. Open approaches form a key aspect of this strategy, enabling the library to use, develop, and most importantly, share tools that cater to a broad user base.

The digital collections, available in an impressive range of languages and formats, are an example of how the library uses open platforms to support international collaboration, thereby reaching a broader market. The ability to work with collections in different languages and formats across borders has enabled the library to engage with a global community. These collections, licensed openly where possible, attract not only researchers but also professionals in the creative industries who reuse and remix the content for new outputs. This accessibility widens the library's appeal and attracts diverse users, thereby enhancing its market share.

Fostering Innovation and Reducing Costs

Previously, tools that libraries needed were either unavailable or not domain specific, so organisations like the British Library turned to open source alternatives which allowed them to create tools that addressed specific research and business needs. For example, open source optical character recognition software to enhance the understanding of historical texts, making previously inaccessible content available for study and reuse. This flexibility gives the library a competitive edge, offering services that appeal to a wider audience.

As a publicly funded organisation, the library operates under strict budget constraints. Open source solutions are an important tool in obtaining value for money, thereby allowing the library to direct funds to other critical areas.

Collaboration as a Market Advantage

Libraries are part of a larger collaborative ecosystem of cultural heritage, including, galleries, archives and museums (GLAM Sector), where sharing knowledge and resources is essential for success. Therefore, one of the most important aspects of open approaches is the fostering of international collaboration, which helps organisations within the GLAM Sector solve common challenges more effectively. An example of this is the library's involvement with the International Image Interoperability Framework (IIIF). This initiative highlights how open source tools based on open standards enable efficient sharing and utilisation of digital collections across various organisations. IIIF is built on open standards, with an accompanying ecosystem of open source software that facilitates key abilities such as deep zoom, image comparison, and virtual reunification of digital items, and annotations. By adopting such an approach, libraries can contribute to and benefit from a global community that supports innovation and resource sharing, thus increasing their market share and making the most of tight budgets.

Long Term Sustainability

A unique challenge faced by memory organisations such as the British Library is that they have to plan for the preservation and accessibility of their collections not just for years but for centuries. Thinking long-term often presents various challenges, but open solutions are inherently flexible, enabling them to adapt to evolving needs and keep up with continuous technological changes.

Conclusion

The British Library's engagement with open approaches has provided numerous advantages that enhance their market share, offering a flexible, cost-effective, and collaborative approach to digital innovation. By contributing to the open source community, the GLAM sector can not only benefit from shared resources but also position themselves as leaders in innovation. In a world where access to knowledge is increasingly digital, open approaches allow cultural heritage organisations to stay competitive and continue serving diverse, global audiences.

5.4 Canonical's Open Source Cloud for BT

BT Group

Clare Schramm, Cloud Engineering Director at BT Group

Canonical

Arno Van Huyssteen, CTO, Canonical

London headquartered Canonical, the publisher of Ubuntu and an open source pioneer in enterprise software, is shaping the telecom industry through partnerships with organisations like BT Group. Delivering advanced, scalable 5G infrastructure through open source innovation and a commitment to flexibility, security, and scalability, it is driving the next generation of telecom networks. Canonical is enabling companies like BT Group to transform their networks and meet the demands of a rapidly evolving digital landscape.

Building a Future-Proof 5G Network with Open Source

For the rollout of their 5G network, BT Group needed a platform that would evolve in response to industry demands and consumer needs, ensuring resiliency and scalability. To achieve this, BT sought a partner who shared their commitment to open source and the transformative possibilities it brings. They chose Canonical, whose open source infrastructure solutions— specifically its telco-grade OpenStack distribution— contributed greatly to this transformation.

By virtualising network functions on OpenStack, BT Group was able to transform its 5G components into software applications independent of underlying hardware to create a software defined network (SDN). This approach not only allows multiple applications to run whilst sharing the same hardware but also enables BT Group to update and scale its network seamlessly.

This level of agility, enabled by open source software, played an important part in EE (part of BT Group) recently being recognised as the UK's best and most reliable mobile network, with its 5G service now available to almost 80% of the UK population as part of an overarching ambition to enable a 5G connection anywhere in the UK by 2028.

This same cloud core also underpins EE's newly launched 5G Standalone (5G SA) network, supporting an ongoing rollout which will cover more than 30 major towns and cities by the end of 2024, with at least 95% coverage in each of those locations.

An Agile and Collaborative Partnership

Unlike traditional vendor relationships, Canonical and BT Group fostered a collaborative partnership focused on co-creation. Working closely, the two companies designed, deployed, and optimised a cloud infrastructure tailored to 5G use cases. This partnership helped BT Group to take full control of their internal infrastructure, with Canonical providing extensive training to provide the team with the skills needed to operate OpenStack at the highest level. This allowed BT Group to move away from reliance on vendors to manage its infrastructure, encouraging them to operate and scale with newfound independence and control.

Redefining 5G Infrastructure through Open Source

Canonical's infrastructure portfolio extends beyond Ubuntu and OpenStack. Canonical's open source software products, such as Canonical Kubernetes, Juju, and MAAS, address some of the key challenges facing telecom companies globally, such as the pressures to modernise legacy systems, embracing cloud native architectures, and increasing cost-efficiency in the midst of rapid digital transformation. One way in which they do this is by enabling hybrid-cloud models (mixing private and public cloud) to connect old and new systems.

Besides providing open source infrastructure technologies, Canonical also offers mission-critical solutions to meet Service Providers' and Enterprises' needs for Mobile Private Networks and Open RAN requirements. With additional features like real-time kernel, data plane optimisation and low-latency solutions (DPDK and SR-IOV), Canonical solutions empower telcos to deliver rapid, reliable service at a large scale.

Capturing New Opportunities with Edge Computing

5G and open source software have also paved the way for telecom's next phase: edge computing. By bringing processing closer to end-users, edge computing's increased speed offers companies greater efficiency, scalability, and cost-effectiveness. Through their open source tools and support model, Canonical empowers telecom providers to explore and monetise edge computing opportunities confidently.

Conclusion

The partnership between BT Group and Canonical is an example of how the telecom sector can embrace open source technologies to transform and innovate at scale. Together, BT Group and Canonical are not only advancing 5G but are setting a new standard for open-source-driven telecom infrastructure that balances control, innovation, and efficiency. This collaboration shows how telecom operators can meet the industry's toughest challenges with open-source solutions that offer flexibility, autonomy, and a future-ready infrastructure. From the perspective of open source, the telecom sector, which has been a resistant adopter, is having its future market shaped by the power of open source software which has disrupted the sector.

6. Conclusion

Dr Jennifer Barth,
Founder Symmetry and
Research Director OpenUK

The dynamic relationship between open source and the market holds the potential to transform the UK—boosting efficiency, driving innovation, and inspiring new business models that harness collaborative efforts across sectors. Open source software now serves as a critical infrastructure layer across industries, including finance, healthcare, government, and telecommunications. This transformation underscores open source software's dual role as both a market disruptor—reshaping how organisations approach innovation, cost, and flexibility—and as an enabler of collaboration across borders and sectors. At the heart of this growth is the economic and societal value of open source software: it allows organisations to leverage collective expertise, reduce costs, and foster new market dynamics by breaking down proprietary barriers. The financial benefits are clear, yet the conversation is nuanced.

Measures of open source software's value can be contentious, and there are many ways to put a £ sign on its full potential. Harvard's recent report redefines this perspective by considering open source software's broader economic impact, estimating the value at $8.8 trillion globally, underscoring that open source software is a key driver of innovation and market competitiveness. While the study considers the costs of open source alongside its value creation, such expenses are often underestimated when considering open source software adoption. Understanding this cost is critical for sustainable implementation. Without proper resourcing, organisations risk incomplete integrations and software maintenance issues, which can ultimately erode the long-term value of open source software.

Open source software's ability to facilitate collaborative innovation is one of its greatest advantages. By enabling shared contributions from a global pool of talent, open source software drives rapid and more inclusive advancements: entities from various industries and regions can contribute, test, and refine technologies collectively. This model has given rise to transformative projects, such as Kubernetes in cloud computing and Hyperledger in blockchain, which have become foundational to modern infrastructure. This collaborative ecosystem doesn't just yield faster innovation; it democratises access to advanced tools, helping smaller organisations compete on a more level playing field with industry giants.

As open source software reshapes industries, it also presents challenges that require careful governance and regulatory understanding. Unlike proprietary software, open source software operates through open licensing, decentralised contribution, and community-driven management, which can create complexity in legal and operational standards. Successful open source software adoption is contingent on comprehending the interplay of governance, technology, and community. For legislators and market participants alike, a nuanced understanding of open source software is essential, as this ecosystem relies on transparency, the protection of intellectual property, and an ethos of equitable use. Overlooking these elements can lead to ineffective policies or project failures, as organisations struggle to align their open source software efforts with broader market expectations.

All of the case studies and fireside chats included here showcase the extension of open source software to ways of working, thinking and collaborating – and to an ethic of innovative engagement that crosses teams, organisations and industries. They all start from the idea that technology is the creation point, the foundation, but that it is the broader ecosystem, the interaction between ideas, people, technology and spaces of creation that allow for new market shapes.

For Open Charge Alliance, open source allows for global and local players to interact – and this interaction is directly related to the core goal to achieve net zero and a sustainable future. The primary goal of The Inspect Platform is to establish a technical infrastructure that fosters collaboration among researchers, safety organisations, governments, and leading model providers – building trust globally but ensuring a steady balance between human and AI considerations. Such collaboration is made possible through the use of open source. OpenEHR offers a seamless global structure to bring health data into view from a sector that has long been marked by fractured and siloed processes. And the British Library leads the GLAM sector with its use of open source and championing of open standards to aid in realising value in a sector that has struggled with market share.

If we were to move to a 'total cost of use' model to understand the relationship between open source software and the market, it means that organisations need to take a more comprehensive view of open source software to reflect the true and ongoing expenses and also the people and processes that are part of the ecosystem. For example, by allocating resources to support the open source software communities they rely on, companies contribute not only to their own software stability but also to the health of the broader open source software ecosystem.

In the UK, open source software has had a particularly strong impact, positioning the nation as a leader in open source software contributions and innovation – as our State of Open reports always highlight. The UK's tech industry has thrived on open source software's collaborative model, benefiting from its role as a top contributor. Nervously we focus on progress made in Europe – that the UK leadership position is under threat. Germany and France are making strategic investments in open source software and AI, advancing their capabilities and potentially surpassing the UK in these fields. To maintain its competitive edge, the UK must not only continue supporting open source software development but also ensure that policies reflect a sophisticated understanding of open source software's nuances in governance, community engagement, and market impact.

The future success of open source software—and by extension, digital innovation—will depend on how well stakeholders understand and address these complexities. For open source software to continue flourishing as a market-shaping force, there must be a commitment from both public and private sectors to support its foundational communities, invest in its infrastructure, and foster policies that embrace the open, collaborative nature of open source software. This means ensuring that the market appreciates and plans for open source software's unique role as both muse and menace to existing market dynamics.

7. Formalities

7.1 Contributors

Amanda Brock, CEO, OpenUK

OpenUK CEO, Amanda's built one of open source's most recognised and impactful organisations. Executive Producer of State of Open Con (2023- 2025), Amanda's a globally sought-after keynote speaker.A lawyer with 25 years' experience, 5 as GC of Canonical, she's been instrumental in shaping open source's legal frameworks, as she was internet law during the early 2000's. Regularly contributing to tech press, she edited 'Open Source: Law, Policy and Practice', (2022).

Recognition: Computer Weekly 50 Most Influential Women in UK Tech (2023, 2024); Computing IT Leaders 100 (2023, 2024); Lifetime Achievement Award WIPL (2022); Women Who Will Changemaker (2023); INvolve Heroes (2022, 2023); Novi Awards (2024) and Ambassador, Open Charge Alliance.

Advisory Appointments: UK Cabinet Office Open Standards Board; UKRI Digital Research Infrastructure; UKRI Exascale; KDE; commercial boards – Mimoto, Scarf, FerretDB and Space Aye; and is Fellow Open Forum Academy; Distinguished Fellow Rust Foundation; and European Representative, OIN.

Arno Van Huyssteen, CTO, Canonical

Arno van Huyssteen is the CTO for Communications Service Providers at Canonical, the company behind Ubuntu. He's an industry veteran who has channelled his passion for technology to drive innovation and change, working with both mobile operators and telco vendors across the globe.

Arno brings deep expertise and insights into critical telecom environments including core network, data centres, distributed infrastructure, automation, and more. He has successfully led large scale transformation programs including swap-outs and greenfield network deployments worldwide while influencing, co-creating and driving industry collaborations in communities and standards authorities to enhance and evolve modern mobile network technologies.

Clare Schramm, Cloud Engineering Director at BT Group

Clare is BT Group's Cloud Engineering Director. She runs the Group's Cloud Services division, a team of 600 professionals dedicated to revolutionising the infrastructure that hosts BT's enterprise IT and network workloads. She previously worked at Google and IBM in various technical leadership roles and is a software engineer by background.

Iain Mitchell KC

Ian G. Mitchell KC practices at both the Scottish and English Bars. He is Honorary KC to Open UK and a member of the Editorial Board of JOLTS. He is also: Chair of the Scottish Society for Computers and Law; a member of the IT Panel of the Bar Council; member of the IT Committee of the CCBE in Brussels; Vice-Chair of the CCBE Surveillance Working Party; Chair of the IT Committee of the European Association of Lawyers; an Honorary lecturer in IT Law at Munster University and a Court Assistant of the Worshipful Company of Information Technologists.

Dr Jennifer Barth, Founder Symmetry and Research Director OpenUK

Jenn has more than 15 years of experience leading independent research on the intersections of emerging technologies and socioeconomic change. She provides companies with independent thought leadership and media engagement opportunities on global issues impacting and shaping our current and future techni-

cal-social lives. Her work spans the digital through to social and economic change. She has looked at sustainability, workforce skills and organisational competitiveness strategies through and beyond the pandemic with Microsoft and many other big and small organisations and works as the Chief Research Office researching the role of open source software and its potential to fuel the circular economy with OpenUK. She has experience working on the human impact of artificial intelligence (AI) through fieldwork experiments with IBM Watson, Microsoft and other providers. She is skilled at blending research methods and working with people to bring to life the stories behind numbers. Dr Barth earned her DPhil in Geography from the University of Oxford.

J.J. Allaire, Staff Engineer, UK AI Safety Institute

J.J. is a Staff Engineer at the UK AI Safety Institute, where he leads development of the Inspect platform. Prior to that J.J. has worked on a variety of popular open source projects including Quarto and RStudio.

Lonneke Driessen, Operational Director, Open Charge Alliance

Lonneke Driessen-Mutters is Operational Director of the Open Charge Alliance (OCA). OCA is a global consortium of public and private electric vehicle infrastructure leaders that have come together to promote open standards through the adoption of the Open Charge Point Protocol (OCPP). She is also Director of Standardisation and Test Lab at ElaadNL, the Dutch Knowledge and Innovation Centre in the field of smart and secure charging infrastructure. Within ElaadNL she is responsible for the EV Charging testing facilities, open standards development and Public Key Infrastructure solutions. Mrs Driessen has a longstanding career in the Utility Industry and has operated in key strategic developments, such as market liberalisation, smart metering and smart grids before entering the EV charging domain nine years ago. She has a Master of SDhwani.Shah@liteon.comcience degree in Electrical Engineering from the Delft University of Technology.

Mike Bracken, Founder Public Digital

Mike Bracken CBE is a global digital leader who has led wholesale transformations of large institutions in the private and public sector. He helps organisations change their way of working and solve systemic market, societal and macroeconomic challenges. He is best known for leading the global revolution in digital government, taking the UK to no.1 in the UN rankings in 2016. He currently advises more than 30 governments and global financial institutions on digital transformation, from Canada and Australia to Argentina, and is currently one of President Macron's Global Tech Thinkers. He is an honorary professor at the Institute for Innovation and Public Purpose at University College London.

Neil Fitzgerald, Head of Digital Research, British Library

Neil Fitzgerald leads the Digital Research Team that works across the organisation to ensure the Library's collections, systems, policies, and processes meet the emerging needs of those who want to deeply integrate digital content, data, and methods, into their work. He is a digital cultural heritage professional with extensive practical and management experience across the international cultural heritage and higher education sectors. A member of a number of advisory boards in the fields of digital humanities and digital cultural heritage. He has also been accountable for the successful delivery of a number of major digital initiatives in the UK and internationally. Before joining the Library, he worked in the commercial sector.

Rachel Dunscombe, CEO OpenEHR

Rachel Dunscombe is the CEO of OpenEHR International. Until August 2022 Rachel spent over five years as the CEO of the NHS Digital Academy. She has provided advisory services to the Secretary of State for Health, been a member of the UK government AI council and through her academic work Rachel has received a Visiting Professorship at Imperial College, London. Rachel is formerly the Director of Digital/CIO for Salford/NCA Group (NHS Hospital Group) which under her leadership was the NHS's most digitally mature organisation. Rachel also sits on the Digital Health Society Board of Directors and is an editor at BMJ Leader.

7.2 About the Creators of this Report

OpenUK

OpenUK is the unique open tech industry body for the business of open technology in the UK. It spans the opens – software, hardware, data, standards and AI and is the convening point for the UK's business, academic and contributing communities across open tech. Our work supports the UK's journey to become "The State of Open". Our organisation is run with the support of our volunteer community and their leadership in the tradition of open source delivering on three pillars: community, legal and policy and learning. Our Community is recognised through our world-leading open tech recognition programme including the OpenUK Awards (the Oscars of Open Source) now in their 5th year, New Year's Honours Lists and Ambassador Scheme.

OpenUK undertakes research and reporting both on its own account through its "State of Open Reports" and on a commissioned basis for third parties. Case studies, Thought Leadership, Surveys and desk-based research are included in our reporting which pushes the envelope and leads the way. Our Research and Reporting Show and Tell events coalesce the global open source research communities digitally to regularly update and share research practices and topics.OpenUK's new OpenUK Fellows Network for postgraduate researchers is launching in 2024 to encourage more academic research across the opens.

The community's strength is channelled to enable a cohesive voice that responds to legislative proposals and sets policy. We have set the agenda in policy matters across openness in the UK and beyond. OpenUK's Policy work leads the conversations around open source licensing and commercialisation, AI openness and cloud computing and other key topics across open source, as they emerge. Engagement with UK policy makers is supported by a volunteer Policy Advisory Board and by experts across our volunteer Advisory Boards and the open source communities. Our Advisory Boards span AI, Communications Tech, Data, Finance, Hardware, Healthcare, Security, Software, Space, Sustainability and Quantum Computing. We are able to provide industry experts across the opens for speaking engagements, consultancy and advisory boards.

OpenUK is the second organisation established anywhere in the world with open source policy as its purpose, our approach is holistic to and representative of the entire open ecosystem.OpenUK undertakes a broad range of activities in support of its policy work and is a day one member of GaiaX and UK's GaiaX Hub Coordinator, hosted one of the biggest tech events at COP26, and was the first organisation in open tech to put a Sustainability Policy and Chief Sustainability Officer in place. Skills and Learning form our third pillar and our Learning work has spanned initiatives for children including our award winning Kids Camps which teach coding, open source and sustainability in a real world context; and exploring the business of open source through our Founder training. We have shared several hundred hours of digital training. Our ambitions include a UK apprenticeship module and adding open source to the UK curriculum.

The State of Open Con has become one of the world's leading open source conferences since its inception by OpenUK in 2023. In 2025 we expect to host 1000 people across 8 tracks and plenary sessions, with at least 50 partners in our delegate experience space and over 200 speakers. Our small events team deliver to the highest standards a series of unique events through the year and our community organise UK-wide OpenUK meet-ups. Contact OpenUK admin@openuk.uk

Symmetry

Symmetry looks beyond the surface and behind the curtain of the fundamental innovations and trends shaping our society, markets, culture, and values. We are academics and researchers looking at the intersections of emerging technology and socioeconomic impact, producing independent research for thought leadership and business solutions. Symmetry's mission is to share and grow knowledge about the interaction of technology and everyday lives. We want to understand the past, present, and future of human interaction with emerging technologies and socioeconomic changes—from behaviour to context, nature to nurture, origin to experiences—helping our clients engage their clients and public imagination.

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7.6 Cover Photos

Cover photos are from our collaborator photographer Tiana Lea, who took 38 portraits for the OpenUK State of Open Exhibition sponsored by Arm[79], and has since taken a further almost 200 portraits at State of Open Con and our Honours list event. We are grateful to Arm for their continued support of this work and will continue to document the people forming the Open Technology community in this way.

Individuals on the front cover of Phase Three: Matt Jarvis, Director of Developer Relations, Snyk; James Governor, Analyst & Co-founder, RedMonk; Carla Gaggini, Head of Content, Events and Community, Container Solutions; Rebecca Rumbul, Executive Director & CEO Rust Foundation; Guy Podjarny, Founder, Snyk; Cheryl Hung, Director of Ecosystem, Cloud Native Foundation (Linux Foundation); Daniel Bryant, Head of Developer Relations, Ambassador Labs; Lorna Mitchell, VP of Developer Experience, Redocly; Iain Mitchell KC, Honorary KC, OpenUK; Mandy Chessell CBE FREng CEng FBCS, Founder of Pragmatic Data Research Ltd.; Terence Eden, Principal Privacy Architect, Our Future Health UK; Matt Barker, President and Founder of Jetstack, Entrepreneur in Residence; Andrew Katz, Consultant, Bristows LLP and CEO, Orcro Limited; Crystal Hirschorn, Director of Engineering, Snyk; Glyn Moody, Tech Journalist; Amandine Le Pape, Co-founder and Guardian of the Matrix.org Foundation. COO and co-founder for Element; Andrew Wafaa, Head of Open Source Program Office, Arm; Liz Rice, Chief Open Source Officer, Isovalent; Andrew Martin, Chief Information Security Officer, ControlPlane; Amanda Brock, CEO, OpenUK; Rob McQueen, CEO, Endless OS Foundation President, GNOME Foundation; Simon Wardley, Thought Lord; Paula Kennedy, Co-founder & COO, Syntasso; Katie Gamanji, Chief Future Founders Officer, OpenUK; Sal Kimmich, Director of Open Source, Escher Coud; Mark Cox, VP Security, Apache Foundation (Log4J); Simon Phipps, OSPO Pioneer; Sam Hepburn, Head of Global Communities, Snyk; Neil McGovern, Executive Director, Ruby Central Inc.; Luke Hinds, Distinguished Engineer; Dominique Top, Solutions Architect at GitLab; Ruth Cheesley, Mautic Project Lead at Mautic; Christopher Howard, Chief Learning Officer, OpenUK; Sami Atabani, VP of IP Licensing; Alexis Richardson, CEO, Weaveworks; Dawn Foster, Director of Data Science, CHAOSS Project; Emma Thwaites, Director of Corporate Affairs, Open Data Institute; Hiren Parekh, Director, WIT Consulting; Ian Burgess, Director, Civic; Jim Davies, Company Secretary, OpenUK; Martin Woodward, Vice President of Developer Relations, GitHub; Steve Bianchi, Chief Operating Officer, Emitwise; Tim Telford, Co-founder, Devtank; Dr Jennifer Barth, Founder, Symmetry; Zin Nwe Zaw Lwin, Lead Designer, OpenUK

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