THE LINUX FOUNDATION | Research

Hyperledger
FOUNDATION

Hyperledger Foundation 2023 Brand Study

How Benefits and Challenges Create Opportunities for the Enterprise Blockchain Brand

October 2023

Anna Hermansen, Linux Foundation Research

Foreword by David Treat, Accenture

With thanks to

Ledger Insights

for survey distribution

Hyperledger Foundation 2023 Brand Study

Sustained adoption and development rates from 2021 to 2023 indicate that blockchain is becoming an established core technology.

Participants were quite familiar with Hyperledger technologies, with 49% very or extremely familiar — up 17% from 2021.

The Hyperledger brand was primarily described as a trusted technology, as being open source, and as an enterprise solution.

One-quarter to one-third of respondents were not at all familiar with Hyperledger Iroha, Hyperledger Besu, or Hyperledger Indy.

The top three benefits of implementing enterprise blockchain are quality assurance for traceability, efficiency, and operating cost reductions.

Hyperledger technologies are considered a viable option for enterprise applications because of their open source and solutions-ready nature and their community support.

Research participants listed supply chain, financial services, identity credentialing, and energy as the top use cases for enterprise blockchain.

Enterprise blockchain has significant promise at its intersection with other technologies, especially artificial intelligence (AI).
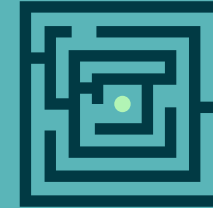
The top challenges to enterprise blockchain adoption were the cost of migration, security risks, and regulatory risks.

There is still confusion between enterprise-grade blockchains and cryptocurrencies, which negatively impacts adoption through regulatory restrictions, misconceptions, and fears.
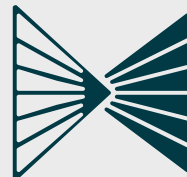
Research participants generally agreed that blockchain represents a form of digital transformation but that this transformation will take time.

Hyperledger Foundation has the footing in the market to make an impact when it comes to regulation and adoption by reducing complexity and increasing support.

Contents

FOREWORD

In my role as Chair of the Hyperledger Foundation Governing Board, I am thrilled to introduce our 2023 brand study, which delves into the global landscape of enterprise blockchain growth and adoption, including the role of the Hyperledger Foundation in this evolving innovation. The year 2023 brings us closer to the realization of blockchain's transformative potential, a vision that we have steadfastly pursued for years. The landscape has evolved significantly since our last brand study in 2021, and it is evident that we are on the slope of enlightenment pushing toward broader adoption.

Use cases moving to production has always been our mission and, if you'll indulge me, I'd like to note a few public examples where that is evident. First with ISSA's "DLT in the Real World" survey that uncovered an impressive stat showing live DLT usage surging fourfold from 8% in 2021 to a remarkable 32% in 2022. We saw Citi Treasury and Trade Solutions (TTS) launch the creation and piloting of Citi Token Services for cash management and trade finance. Additionally, JPMorgan executed its first live blockchain-based collateral settlement transaction involving BlackRock and Barclays. Furthermore, the journey towards Central Bank Digital Currencies (CBDCs) has gained continued momentum as 130 countries, representing a comprehensive 98% of global GDP, are now exploring the future of CBDCs. (Read more about the role of our technologies in the report Hyperledger in Action for Central Bank Digital Currencies.) While production CBDCs may have a longer runway, there are strong signs of forward momentum such as François Villeroy de Galhau, Governor of Bank of France saying "…experiments will be rolled out over the course of next year, including trials with real transactions" in reference to a wholesale Digital Euro.

Our own community within the Hyperledger Foundation have played a pivotal role in advancing the market, fostering growth, and ensuring that blockchain remains at the forefront of technological innovation. While the journey towards "enterprise-grade market maturity" is ongoing, we can see tangible traction in several key areas, including Tokenization with the groundbreaking work of IPWe and making waves with Hyperledger Besu for Enterprise Ethereum. Finally, we cannot forget about the imperative of Digital Identity, which was highlighted as a strategic objective in the White House's National Cybersecurity Strategy. The blockchain story is far from complete, but the pages are turning, and we are honored to be a driving force in this narrative.

As we delve into this brand study, it is essential to appreciate the incredible strides we have made collectively and the transformative impact that blockchain continues to deliver to businesses, governments, and society at large. This study encapsulates not only our achievements and progress but also serves as a guidepost for the future. It underlines the need for continued innovation, collaboration, and adaptation as we journey towards a more digitally-connected, transparent, and efficient world. We are proud to be at the forefront of this technological renaissance and remain committed to driving blockchain's growth, adoption, and realization as a foundational element of the global digital landscape.

Thank you for joining us on this remarkable journey.

David Treat

Accenture, Senior Managing Director
Global Metaverse Continuum Business Group Lead
Governing Board Chair, Hyperledger Foundation

INTRODUCTION

Blockchain has experienced significant cultural, technological, and economic shifts in the past few years: crashing crypto prices, the non-fungible token (NFT) phenomenon, regulatory gains and hurdles, ebbs and flows of different enterprise use cases, Ethereum's merge to a proof-of-stake consensus mechanism, the spectacular rise and fall of crypto organizations such as FTX, the burst in financial services tokenization, and a government-mandated push for digital identity, to name a few.[1,2,3] These different moments have left marks on enterprise blockchain as it continues in its adoption and development. As one of the larger projects in this space, where does the Hyperledger Foundation fit in this story? And how does the public perceive the Foundation in this current period?

Answering these questions is what spurred this research study. It has been two years since Linux Foundation Research and Hyperledger Foundation first studied the perceptions, awareness, and adoption of enterprise-grade blockchain technology and Hyperledger Foundation's specific projects. The 2021 Hyperledger Brand Study argued that enterprise blockchain was in the "trough of disillusionment" on the Gartner hype cycle, with regulatory concerns, technological complexity, and siloed development challenging its advancement. It listed a number of opportunities for Hyperledger Foundation to support progress in adoption and development, leveraging its strengths as an open source, community-driven foundation with wide support from enterprise and strong brand recognition. It also predicted growth and maturation in enterprise blockchain technology and use cases following the hiccups of the first years.

Two years later, the Hyperledger Foundation and Linux Foundation Research collaborated again to investigate this prediction. The 2023 research project was developed to measure public sentiment in comparison with the 2021 report, with the backdrop of the last few years of progress in the blockchain space. By identifying the current perceptions of the technology, the ways that they differ from the 2021 report, and what might be causing these perceptions today, this research provides the opportunity for Hyperledger Foundation to make strategic decisions around its projects, direction, and community. Taking a broad look at the enterprise blockchain landscape also allowed us to situate Hyperledger Foundation within the ecosystem to understand how it compares with alternatives.

This report summarizes the findings from our study and analyzes what these findings mean for the Hyperledger Foundation member community and the wider enterprise blockchain ecosystem.

METHODOLOGY

This mixed-methods study used interviews and a survey to gather data. The survey was built following the structure and content of the 2021 survey, and the interview guide was created based on the goals of the study. The interviews ran before survey data collection, and the qualitative data was analyzed before data analysis of the survey findings. The qualitative findings were grouped into emergent themes, which were then used to group the survey findings.

Subject matter experts were recruited to be interviewees for this research through Hyperledger Foundation and Linux Foundation channels. Individuals were identified by the project teams and then emailed with a request for their participation. Interviews were held and recorded over Zoom and then transcribed for analysis. Interviewees were given an opportunity to review their quotes for accuracy after the author completed a first draft of the report.

For our survey data, we followed a data collection process that aimed to reduce sample bias and ensure high data quality. To reduce bias, we sourced participants primarily from a third-party panel provider (78%), with the rest from Linux Foundation, Hyperledger, and Ledger Insights communities (22%). Participants were recruited through the Linux Foundation Research email subscriber list and the Hyperledger Foundation subscriber list, and advertisements for participation were circulated on Twitter and LinkedIn. We partnered with Ledger Insights to help us promote the survey in their channels. We used a panel from Boston Research Group to recruit the majority of our respondents.

To address data quality, we used screening criteria to ensure that respondents had sufficient familiarity with blockchain and professional experience to answer questions accurately on behalf of the organization they worked for. Once the survey data were collected, we hand-reviewed each entry to remove any responses we identified as bad data: unnaturally fast response times, duplicate IP addresses, any spam responses to the free-text questions, and anyone that stopped the survey too early. We included some survey respondents in the sample that did not make it to the end of the survey, which is why the sample number is not always the same throughout this reporting. For more details about the screening criteria used and access to the survey dataset, see http://www.data.world/thelinuxfoundation.

RESULTS

We interviewed six subject matter experts and had a final sample of 298 survey respondents. Our participants were evenly located in Asia Pacific (34%), the Americas (32%), and Europe (31%). Just under half identified as White (49%), with the next largest group identifying as Asian (36%). We surveyed more men (65%) than women (32%), and more than three-quarters (78%) of respondents identified as heterosexual. Fifteen percent identified as having a disability. Demographics are broken down in TABLE 1, below. Not all percentages will add up to 100% due to rounding.

TABLE 1

SURVEY DEMOGRAPHICS

Location of Residence

- **34%** Asia Pacific
- **32%** The Americas
- **31%** Europe
- **3%** Other

Disability

- **83%** No
- **15%** Yes
- **1%** Prefer not to answer

Racial Background

- **47%** White
- **35%** Asian
- **7%** Black
- **5%** Hispanic/Latinx
- **3%** Prefer not to answer
- **1%** Other
- **1%** Native or Indigenous
- **1%** Pacific Islander

Sexual Orientation

- **78%** Heterosexual
- **8%** Bisexual
- **7%** Prefer not to answer
- **3%** Asexual
- **2%** Gay
- **.8%** Pansexual
- **.4%** Lesbian
- **.4%** Questioning

Gender

- **65%** Man
- **32%** Woman
- **3%** Other
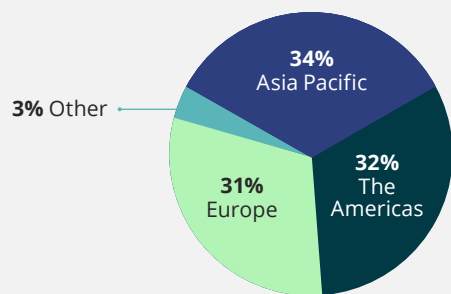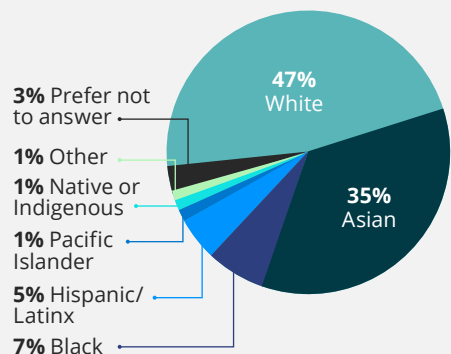
Transgender
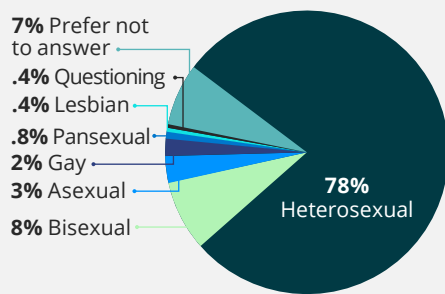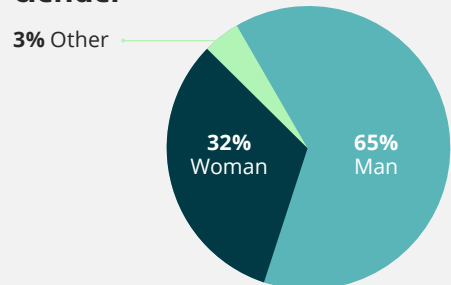
- **94%** No
- **3%** Transgender
- **3%** Prefer not to answer
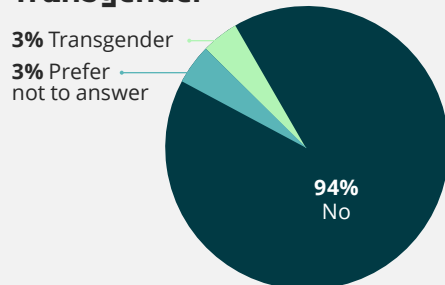
The following sections review the findings from the survey and interviews, following the themes that we developed during analysis: adoption and maturity of blockchain, benefits, use cases, and challenges. See the Appendix for the full list of questions and their aggregate responses. The final section looks forward, discussing Hyperledger's future opportunities given the findings of this research.

Adoption and maturity of blockchain

Current state of enterprise adoption and development

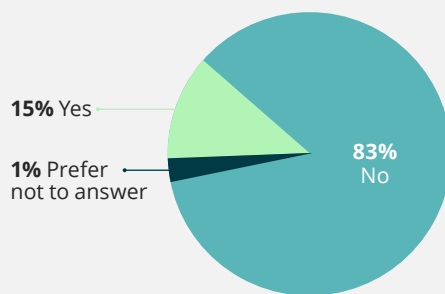A portion of our survey and interview questions investigated the adoption of blockchain and the development of applications to understand the current trends in this technology sector. Our findings suggested sustained activity in blockchain adoption and development. Thirty-seven percent of respondents reported that their organizations are at the implementation stage, with another quarter (26%) currently evaluating or testing blockchain (**FIGURE 1**). According to 34% of respondents, their organizations were in a production deployment phase of blockchain development (**FIGURE 2**).

These numbers hold up from the 2021 report, where 33% of respondent organizations were at the implementation stage and 22% were currently evaluating blockchain when it came to adoption. In 2021, 25% of respondents were at the production deployment stage of their development.[4] The sustained adoption and development rates echo the sentiment described by our interviewees that blockchain is moving away from being a trend and toward a more established core technology.

Wanting Huang, Senior Manager of the Metaverse Continuum Business Group at Accenture, defined the state of the blockchain market through a reference to Accenture's annual Technology Vision report.[5] "In 2017, we considered blockchain a trend. And it has grown, and since 2021, it's been considered a sustainable business by itself." This sustainability manifests in continued enterprise interest, which both Marcus O'Dair, Associate Dean of

Knowledge Exchange and Enterprise at the University of the Arts London, and Aly Madhavji, Managing Partner at the Blockchain Founders Fund, confirmed. "Over the last few years, [existing intermediaries] have actually become much more interested in it," O'Dair expressed. Similarly, Madhavji explained how he has seen increased enterprise interest in his area, stating, "even after FTX went down, we were quite surprised by the conviction of some of the corporates. They were still very bullish in the sector."

This move away from trend also manifests in the way that organizations are no longer searching for a nail with the blockchain hammer. In Huang's words, "we had some early cases back when blockchain was just coming up, and everyone was trying to find a hammer for their use case... but I think most people don't care about the technology, as long as it delivers what is needed." This fervor seems to have died down, according to Paige Bartley, Senior Research Analyst at S&P Global Market Intelligence: "I think the fervor is starting to settle down. Enterprises are becoming more educated on the technology, they're becoming more methodical about why they adopt and what use cases they are going to adopt for." As the ecosystem moves forward, enterprises appear to be less focused on the hype of the technology and more on its capabilities in the longer term, which may be manifesting as sustained adoption and development levels found in our survey.

Blockchain's progress can also be defined by its breadth. O'Dair felt that the enterprise market's scale has grown beyond a handful of companies building consortia in walled gardens. Anthony Day, Head of Strategy & Marketing at Midnight, agreed with this growth, asserting that the industry is getting busier. "The number of places you can go for [decentralized infrastructure] is increasing, which is a good thing—competition is good. You've got a number of organizations that are focused primarily

FIGURE 1

CURRENT STATE OF BLOCKCHAIN ADOPTION AT RESPONDENTS' ORGANIZATIONS

More than half of respondents (63%) have already implemented or are testing blockchain but 15% do not have blockchain on their radar.

Already has implemented, or is currently implementing blockchain technologies — 37%
Currently evaluating or testing blockchain technologies — 26%
Blockchain technologies are not currently on our radar screen — 15%
Have discussed blockchain technologies — 13%
Accepts cryptocurrency as a payment mechanism — 6%
Don't know or not sure — 4%
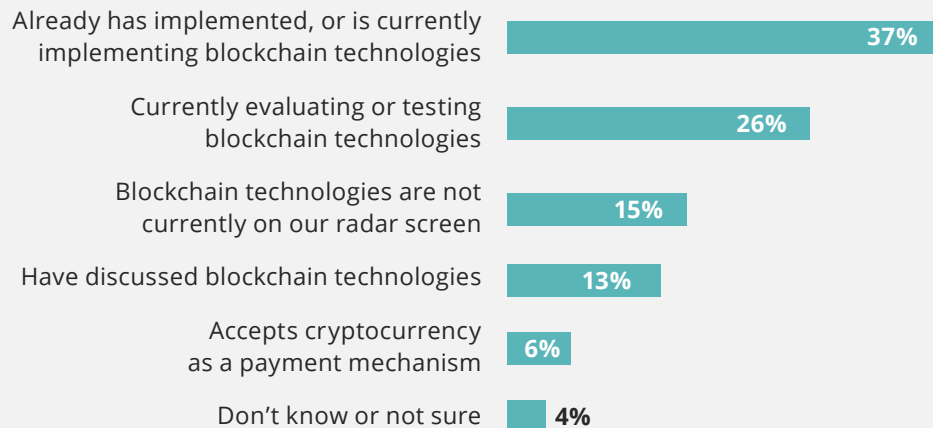
Hyperledger Foundation 2023 Brand Study, Q11, Sample size = 298

on private and permissioned." He also predicted more competition in the future: "It's going to become more competitive, not less." As suggested by Day, this proliferation of blockchain organizations signifies a healthy, competitive market.

The stronger foothold also translates to integrations with other technologies. "The technology packages for enterprises have become more usable, or more mature, we've got more integrations, we've got more collaborations that make it easier," Day stated. This kind of technological integration could signify that blockchain is becoming a core technology. Madhavji agreed that success relies on interaction with other technologies. "Any great technology is the intersection and timing of some other technologies that culminate in a perfect melting point," he said, linking the value of AI and IoT to the value of blockchain. "It's really the only way any of these technologies will even succeed—it's the combination of them at the right time."

Huang's work with the Metaverse Continuum[6] reinforces this idea. She described the program as the intersection of cloud, XR, AI, and blockchain. "We consider it as a continuum of technology, different technologies enabling [the Metaverse] experience. The advancement of all of them will be needed to make progress." Bartley also commented on the importance of integration with other technologies. She focused on the novelty of the technology, stating, "It's an emergent technology. When we invented the smartphone, there were use cases that hadn't been thought of yet. And that's going to be the case for a while, until newer technologies emerge that are possibly a perfect fit to have blockchain as a supporting mechanism." For our interviewees, blockchain's integration with other technologies is an important marker of its success and growth.

The enterprise-grade blockchain ecosystem appears to be in a period of sustained adoption and development, with indications that the technology is moving past the highs and lows of the trend and is becoming a more integrated core component of enterprises.

FIGURE 2

CURRENT STATE OF BLOCKCHAIN DEVELOPMENT AT RESPONDENTS' ORGANIZATIONS

Half of respondents (51%) are in production deployment or proof of concept but 12% have no development intention and 9% are stalled in their progress.

Production deployment	34%
Proof of concept	17%
Field trials	16%
No development intention	12%
Stalled post-pilot	9%
Pre-proof of concept	8%
Don't know or not sure	5%
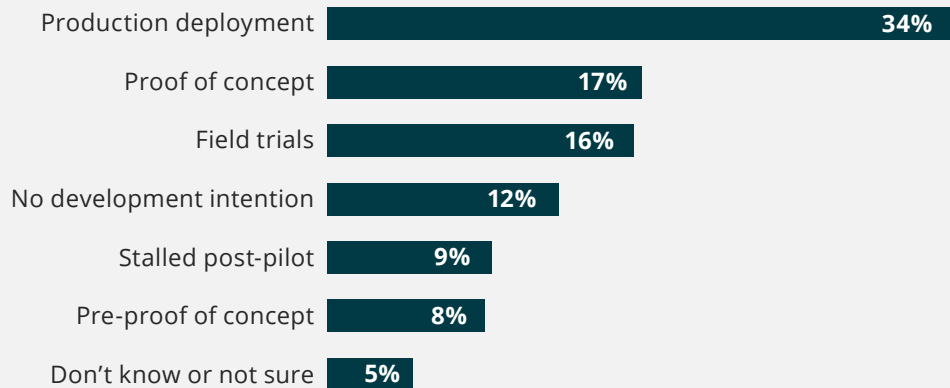
Hyperledger Foundation 2023 Brand Study, Q26, Sample size = 265

THE NFT EFFECT

Both O'Dair and Day discussed the effect that the NFT phenomenon has had on blockchain adoption. According to O'Dair, "NFTs changed the conversation because they are very tangible. Five years ago, a lot of conversations were quite conceptual and abstract: it was about what *could* happen. Although the NFT phenomenon had its ups and downs, it introduced a completely different scale of activity because it connected with individual users." He argued that NFTs also helped individuals understand blockchain and its different layers.

In agreement with O'Dair, Day looks at this scale of activity from the perspective of the number of companies that are experimenting in the NFT space. "I think something like 250+ brands last year dabbled in something relating to tokenization, or the use of blockchain to create experiences, or art, or community," he estimated. "That's a lot. And with those brands, they carry a following. And the implication of attracting their existing user base to a blockchain platform—that's very powerful for technological adoption at a wide scale." Whether or not this visibility was always positive, the ubiquity of NFTs created an opportunity for greater public engagement with and understanding of blockchain, opening doors for adoption and implementation at the enterprise level.

STALLS IN PROGRESS

Despite finding positive progress in this space, our data also point to some stalls in progress. For example, in **FIGURE 1**, 15% of respondents said that blockchain is not currently on their organization's radar. Similarly, 9% of respondents' organizations have blockchain development that stalled post-pilot, and 12% don't have any development intention (see **FIGURE 2**)—both of those numbers are up from 2021 (4% and 7%, respectively).[4]

Although he has seen sustained and even "bullish" interest from the enterprise audience, Madhavji pointed out that we are not yet at mainstream adoption. As he argued, "when you look at some of the bigger things that some of these companies have done—you would probably expect it to be more mainstream by now. You haven't seen big companies integrate where it could make sense." He qualified this, saying, "It's moving. I don't know that it's always moving fast enough, but it is moving."

Some interviewees placed this stall in progress in the context of the hype cycle. For example, Eric Hess, Founder & Managing Counsel at Hess Legal Counsel, asserted that "blockchain needs to demonstrate a return on investment, some sort of value creation, which is different from previous years." Day felt similarly, adding more context to what is different this year:

> "There is increasing pressure on investment spend, or the burden of proof for turning it into a business is higher. We saw in 2017, 2018, 2019, where, because blockchain was more popular than AI or whatever came next… these organizations could spin up a blockchain thing, or a consortium, or a business network, to test the model. And then they found that decentralization is hard, or that it doesn't always necessarily fit with their business model."

The idea that the hype has worn off around blockchain seemed to come through in other discussions, particularly when it came to the visibility of Hyperledger technologies. Huang asked about the Hyperledger Foundation's strategy, stating, "Compared to a year or so ago, I received much more push about Hyperledger Fabric and some other capabilities. And I see much less nowadays," although she cited a change in job role as the potential reason for that. Similar to his comments in the 2021 interview,[4] Madhavji also expressed hearing less of Hyperledger projects: "I feel like I used to hear 'Hyperledger' even more than I do now. I'm not sure. But I think I used to hear 'Hyperledger' more in conversations before, I used to hear Hyperledger's name more in the mix of consideration for which blockchain to use. We don't hear it much anymore."

The stall in progress expressed by our survey respondents and interviewees suggests similarly that the technology is moving past the hype, which translates to less popularity and a greater burden of proof. There are important challenges that come with this stage of the hype cycle, and to a certain extent, the technology still has to prove itself before it can be considered mainstream. However, our findings show a generally positive picture of blockchain adoption at the enterprise level.

Impressions of Hyperledger brands and technologies

Moving beyond general impressions and perceptions of enterprise blockchain, our survey also asked respondents about their knowledge and impressions of specific blockchain brands, including those under the Hyperledger umbrella. Participants were generally familiar with Hyperledger technologies, with just under half (49%) very or extremely familiar with Hyperledger technologies (see FIGURE 3). This familiarity has grown since the 2021 report, where only 32% of respondents were very or extremely familiar. However, of our entire sample—made up of individuals who are already familiar with blockchain—11% of respondents were not at all familiar with Hyperledger technologies. This number has dropped since 2021, where 17% of respondents were not at all familiar.

FIGURE 3

FAMILIARITY WITH HYPERLEDGER TECHNOLOGIES

49% are very or extremely familiar with Hyperledger but 11% are not at all familiar with it.

Very familiar	31%
Somewhat familiar	29%
Extremely familiar	18%
Not at all familiar	11%
Not very familiar	10%
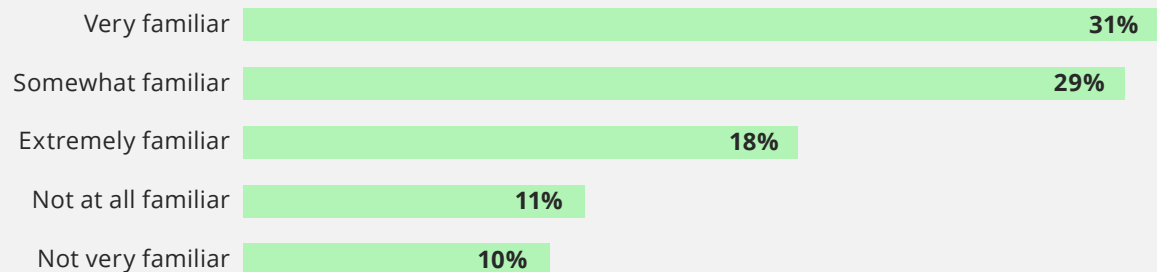
Hyperledger Foundation 2023 Brand Study, Q10, Sample size = 298

Compared with other brands, participants were most familiar with Hyperledger and Ethereum, followed by Digital Asset (see **FIGURE 4**). Zooming in on Hyperledger projects, participants were most familiar with Hyperledger Fabric, Hyperledger Iroha, and and least familiar with Hyperledger Indy (see **FIGURE 4**). However, one-quarter to one-third of respondents were not at all familiar with Hyperledger Iroha, Hyperledger Besu, or Hyperledger Indy.

Both Bartley and O'Dair made comments that add context to these findings. First, in light of the lack of awareness around specific Hyperledger projects, Bartley commented on the challenge of keeping up with the technology: "Hyperledger projects are constantly evolving. And for an average consumer or worker to keep up with that, and understand the potential use cases, that's a massive level of education being asked of them." Second, O'Dair spoke to the greater familiarity with Ethereum, linking this wider

FIGURE 4

FAMILIARITY WITH DIFFERENT ENTERPRISE-GRADE BLOCKCHAIN BRANDS

	Very familiar	Familiar	Somewhat familiar	Only heard the name	Not familiar at all	Don't know or not sure
Ethereum	40%	21%	19%	6%	11%	3%
Hyperledger	31%	25%	22%	12%	8%	1%
Digital Asset	23%	22%	17%	11%	21%	5%
Hyperledger Fabric	23%	19%	19%	15%	20%	4%
Polygon	23%	18%	17%	19%	17%	5%
Cardano	22%	17%	18%	11%	27%	5%
Hyperledger Iroha	18%	20%	15%	16%	28%	4%
Hyperledger Besu	16%	15%	18%	16%	30%	5%
Corda	15%	19%	16%	15%	30%	5%
ConsenSys Quorum	15%	18%	13%	17%	33%	5%
Hedera	15%	16%	12%	17%	32%	7%
Hyperledger Indy	14%	20%	14%	15%	32%	5%
Algorand	13%	20%	12%	19%	30%	6%
Casper	13%	16%	13%	20%	30%	8%

Hyperledger Foundation 2023 Brand Study, Q20, Sample size = 274

knowledge to NFTs. "I don't hear Hyperledger—or Bitcoin, for that matter—talked about as much as Ethereum. I think the non-fungible token phenomenon really helped Ethereum, but I don't hear a lot of people talking about Hyperledger for creative economy applications." He qualified this, saying, "it might be different if you were talking to [an enterprise audience], but in the creative world, I don't know many who have used it in the end."

After capturing familiarity with these brands, respondents were asked how they would describe them. As a brand, Hyperledger was primarily described as a trusted technology, as being open source, and as an enterprise solution (see **FIGURE 5**). In comparison with the other brands, Hyperledger came out on top as the most open source solution, and alongside its projects—specifically Hyperledger Fabric—as the top collaborative project (see **FIGURE 6**). However, in line with the

FIGURE 5

DESCRIPTIONS OF THE HYPERLEDGER BRAND

Description	Describes completely	Describes somewhat	Does not describe at all	Don't know or not sure
Trusted technology	59%	26%	3%	12%
Open source	58%	31%	2%	9%
Enterprise-grade technology	57%	30%	3%	9%
Develops solutions for private and public blockchain solutions	53%	31%	2%	13%
The Linux Foundation's umbrella blockchain project	52%	30%	4%	14%
Provides access to blockchain vendors and partners	52%	29%	4%	15%
Evolves to meet new demands	51%	32%	3%	14%
Open development model	50%	33%	4%	13%
Develops production-ready technologies	47%	36%	5%	12%
Has well-established use cases	46%	34%	5%	15%
Is part of a non-profit foundation	46%	29%	7%	18%
Open governance model	43%	36%	6%	15%

■ Describes completely ■ Describes somewhat ■ Does not describe at all ■ Don't know or not sure

Hyperledger Foundation 2023 Brand Study, Q25, Sample size = 268

findings of **FIGURE 4**, there was a clear challenge in defining Hyperledger Foundation's projects, where, again, one-quarter to one-third of respondents did not know or were not sure how to define Hyperledger Indy, Hyperledger Iroha, Hyperledger Besu, or Hyperledger Fabric.

Some of the interviewees were aligned on these definitions. For example, Day described the "ethos" of Hyperledger Foundation as "investing in the code and in the community." This focus on community and consortium was echoed by Huang, who felt that "compared to many other solutions, Hyperledger Fabric still has a very active community around it and a clear roadmap on future development." She argued that there is confidence in "where [Hyperledger Fabric] is going, and that it will not go away. Because there are just so many different bodies standing behind it."

FIGURE 6
DESCRIPTIONS OF DIFFERENT ENTERPRISE-GRADE BLOCKCHAIN BRANDS

	Open source consortium	Collaborative project	Cryptocurrency	Blockchain platform	Don't know or not sure
Hyperledger	19%	16%	9%	40%	16%
Hyperledger Indy	13%	13%	9%	29%	36%
Hyperledger Iroha	10%	17%	6%	30%	37%
Hyperledger Besu	9%	17%	10%	28%	36%
Hyperledger Fabric	9%	22%	11%	30%	28%
ConsenSys Quorum	10%	12%	9%	30%	38%
Polygon	8%	14%	16%	31%	32%
Algorand	8%	13%	14%	31%	35%
Cardano	8%	10%	22%	29%	31%
Digital Asset	7%	14%	23%	22%	33%
Corda	6%	12%	11%	35%	35%
Hedera	6%	17%	9%	26%	41%
Ethereum	5%	10%	39%	32%	14%
Casper	4%	16%	10%	26%	44%

■ Open source consortium ■ Collaborative project ■ Cryptocurrency ■ Blockchain platform ■ Don't know or not sure

Hyperledger Foundation 2023 Brand Study, Q21, Sample size = 274

The survey also asked respondents about their perceptions of the different brands, ranging from "very positive" to "very negative." There were significantly positive perceptions about all of the brands, but, again, a high number of respondents did not know or were not sure enough to give a percept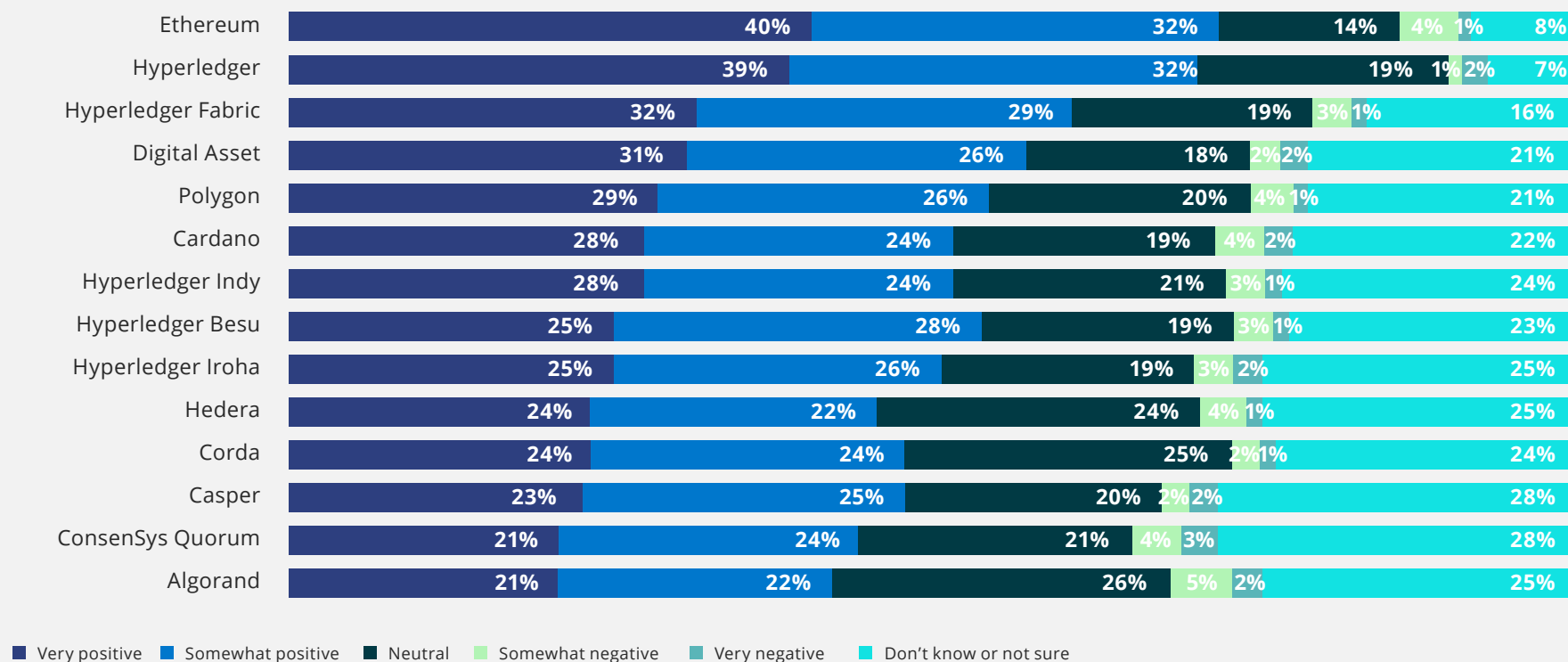ion on most of the brands (see FIGURE 7). Following the discussion of perceptions, we asked participants about their interest in adopting different brands.

Hyperledger technology was most likely to be implemented compared with other brands (see FIGURE 8). We then asked participants to focus on their interest in adopting different Hyperledger projects. There was interest across different projects, but again, some uncertainty as well, where one-quarter didn't know or weren't sure which projects are of interest (see FIGURE 9).

FIGURE 7
PERCEPTIONS OF DIFFERENT ENTERPRISE-GRADE BLOCKCHAIN BRANDS

Brand	Very positive	Somewhat positive	Neutral	Somewhat negative	Very negative	Don't know or not sure
Ethereum	40%	32%	14%	4%	1%	8%
Hyperledger	39%	32%	19%	1%	2%	7%
Hyperledger Fabric	32%	29%	19%	3%	1%	16%
Digital Asset	31%	26%	18%	2%	2%	21%
Polygon	29%	26%	20%	4%	1%	21%
Cardano	28%	24%	19%	4%	2%	22%
Hyperledger Indy	28%	24%	21%	3%	1%	24%
Hyperledger Besu	25%	28%	19%	3%	1%	23%
Hyperledger Iroha	25%	26%	19%	3%	2%	25%
Hedera	24%	22%	24%	4%	1%	25%
Corda	24%	24%	25%	2%	1%	24%
Casper	23%	25%	20%	2%	2%	28%
ConsenSys Quorum	21%	24%	21%	4%	3%	28%
Algorand	21%	22%	26%	5%	2%	25%

■ Very positive ■ Somewhat positive ■ Neutral ■ Somewhat negative ■ Very negative ■ Don't know or not sure

Hyperledger Foundation 2023 Brand Study, Q22, Sample size = 268

In summary, Hyperledger-branded technologies represent a familiar and popular option for enterprise-grade blockchain implementation, despite a knowledge gap on the Foundation's specific projects. There are positive perceptions of the brand, and its most relevant characteristics for respondents included the fact that it is open source, collaborative, and enterprise-focused. The next section breaks down how these characteristics make it a useful tool for enterprise needs.

FIGURE 8

TECHNOLOGIES MOST LIKELY TO BE CONSIDERED, EVALUATED, OR IMPLEMENTED

Technology	Percentage
Hyperledger	50%
Ethereum	38%
Hyperledger Fabric	31%
Polygon	21%
Hyperledger Indy	19%
Corda	17%
Hyperledger Besu	17%
Hedera	16%
Digital Asset	16%
Hyperledger Iroha	16%
Cardano	15%
ConsenSys Quorum	12%
Casper	12%
Algorand	11%
Don't know or not sure	14%
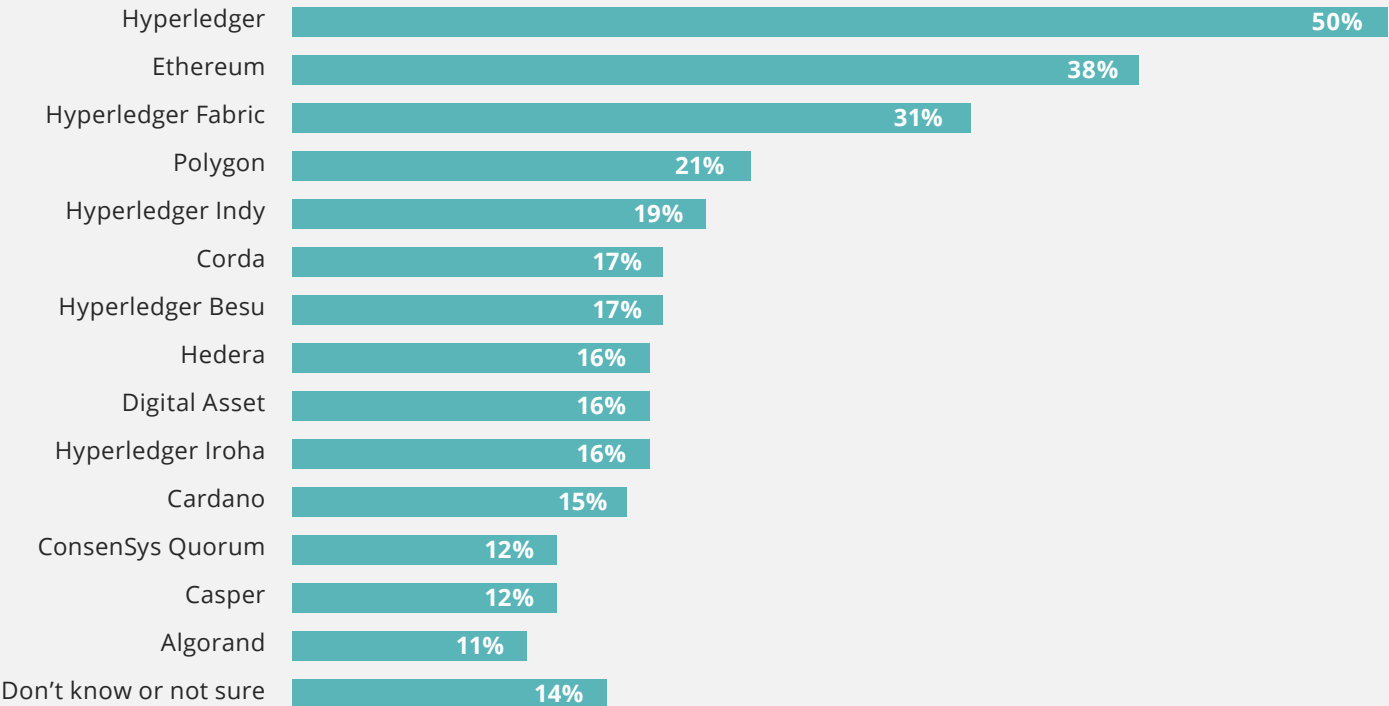
Hyperledger Foundation 2023 Brand Study, Q28, Sample size = 265, Count = 867

FIGURE 9

HYPERLEDGER TOOLS MOST LIKELY TO BE CONSIDERED, EVALUATED, OR IMPLEMENTED

Hyperledger Aries	31%
Hyperledger Firefly	27%
Hyperledger Explorer (now a Lab)	26%
Hyperledger Solang	25%
Hyperledger Bevel	24%
Hyperledger Cacti	20%
Hyperledger AnonCreds	18%
None of the above	8%
Don't know or not sure	24%
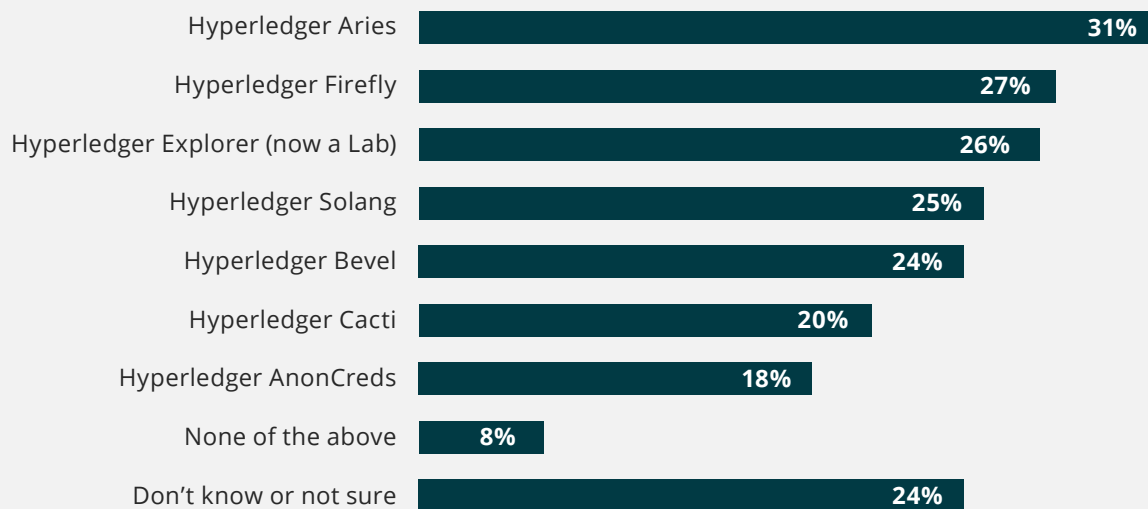
Hyperledger Foundation 2023 Brand Study, Q29, Sample size = 265, Count = 540

Benefits

General benefits of implementing and participating in blockchain development

The continued interest in blockchain adoption suggests that the public sees compelling benefits of, and use cases for, the technology. To better understand this perspective, we asked our survey respondents to rank predefined benefits and features of blockchain technologies. The top three benefits were quality assurance for traceability, efficiency, and operating cost reductions (see FIGURE 10). These benefits differed from the 2021 report, where trust came out much higher: 72% of respondents felt that decentralized databases help in situations that lack trust, and 68% liked that they create a single source of truth.[4]

Interviewees defined these same benefits and more. Their lists included competitor collaboration, disintermediation, individual access to and ownership of personal data, privacy, security, transparency, and immutability. Day shed light on the value of competitor collaboration, linking this collaboration with disintermediation. For him, using blockchain for something like tracking provenance means "we're going to bring together all of these different parties who are competitors or peers in an industry... and we're going to connect them with a combined database that also allows for applications to be built. And we're going to transform stuff because we can do things faster or better without a custodian. And that's every industry, from aviation, to medical, to foodstuffs, to luxury goods, to everything you can think of." According to Day, blockchain unlocks innovation and industry transformation at its core.

O'Dair also spoke of the benefits across industries, focusing on the opportunity for data sovereignty. He stated, "the data sovereignty conversations that you would have in healthcare are probably similar to the ones in the creative economy. Rather

than talking about patients being able to access their data, you're talking about creators and potentially even fans being able to access data." This discussion also led to the benefits of transparency and auditability when it comes to intellectual property data for the creative industry. Bartley agreed on the value of auditability, saying, "it all comes down to how effectively it is indelible and distributed, and you can prove what has happened in an ecosystem—be it a supply chain or a transactional ecosystem. Better than a lot of our traditional records systems that depend on integration and centralization efforts, you can prove that something has happened. And there's a lot of value in that." Those foundational features of blockchain, while making the technology difficult to grasp, opens up important
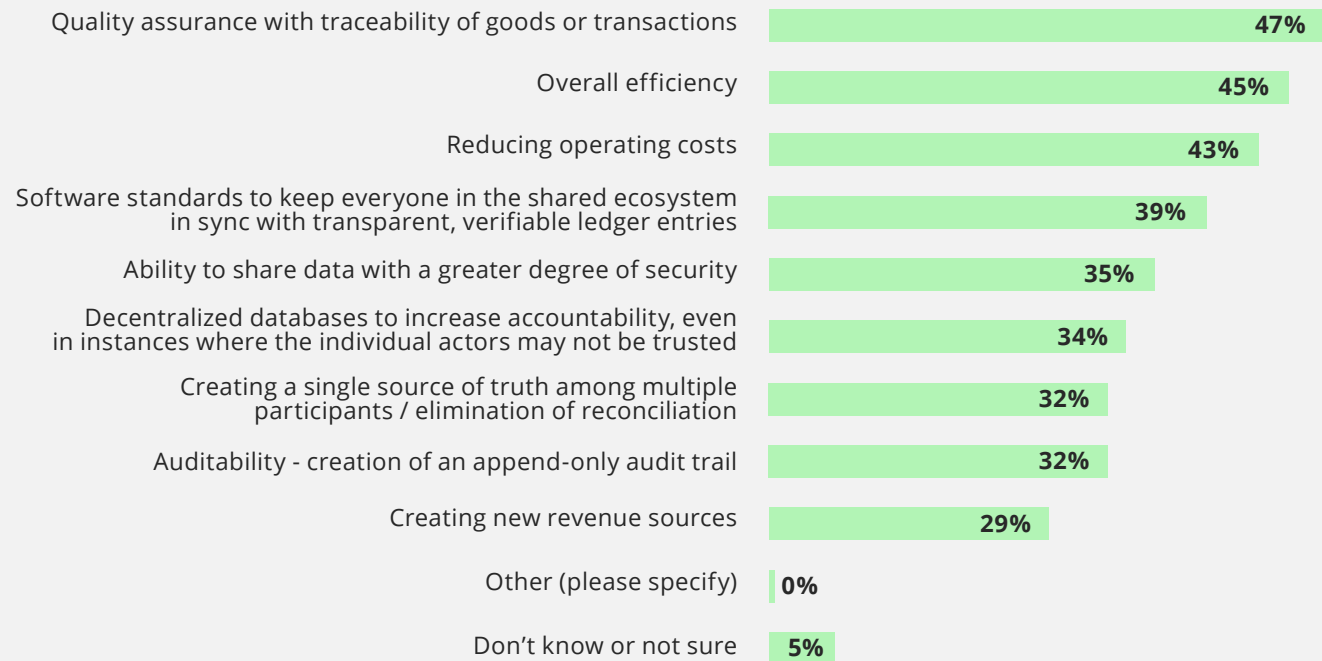
avenues to transform data accessibility, auditability, competitor collaboration, and, ultimately, trust.

Benefits of Hyperledger technologies

We also asked our survey respondents to rank different blockchain features. There was not significant differentiation between these features, but the top three were public/private hybrid solutions, collaboration, and open development (see **FIGURE 11**).

As discussed in the above section, respondents described Hyperledger with similar characteristics. For example, in **FIGURE 5**, 53% of respondents felt that the response option "Develops solutions for private and public blockchain solutions"

FIGURE 10

MAIN BENEFITS OF ENTERPRISE-GRADE BLOCKCHAIN TECHNOLOGIES

Benefit	Percentage
Quality assurance with traceability of goods or transactions	47%
Overall efficiency	45%
Reducing operating costs	43%
Software standards to keep everyone in the shared ecosystem in sync with transparent, verifiable ledger entries	39%
Ability to share data with a greater degree of security	35%
Decentralized databases to increase accountability, even in instances where the individual actors may not be trusted	34%
Creating a single source of truth among multiple participants / elimination of reconciliation	32%
Auditability - creation of an append-only audit trail	32%
Creating new revenue sources	29%
Other (please specify)	0%
Don't know or not sure	5%

Hyperledger Foundation 2023 Brand Study, Q31, Sample size = 262, Count = 895
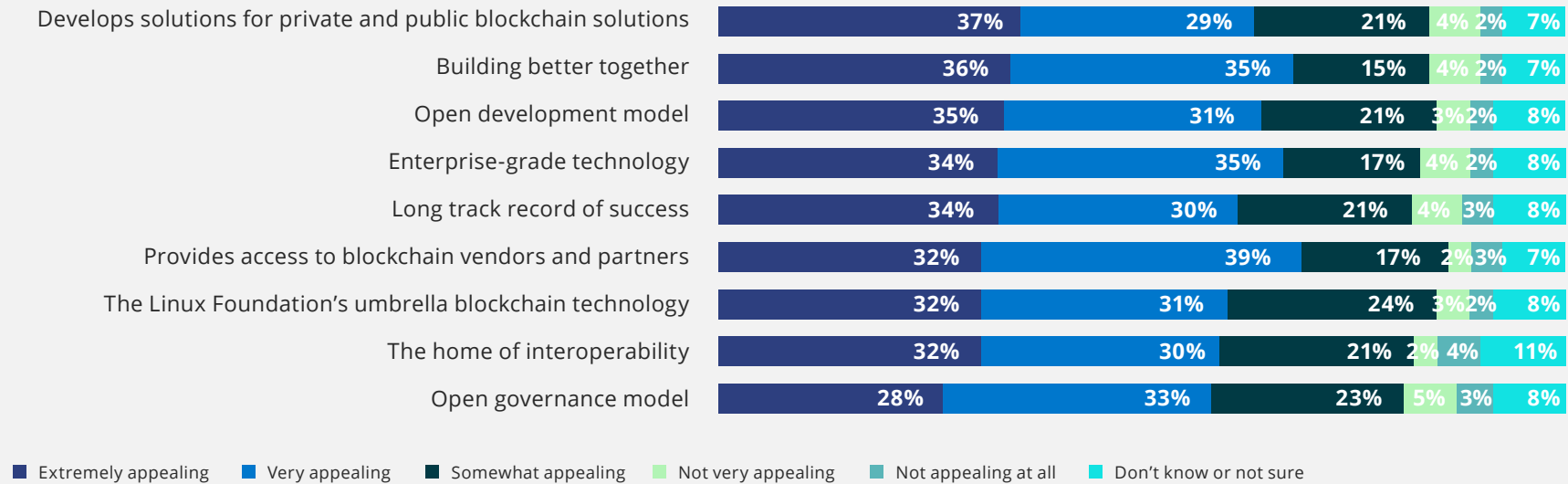
described Hyperledger Foundation completely, and only 2% felt that it did not describe the Hyperledger brand at all. Hyperledger Foundation's open source definition was also high on the list, tracking with the "open development model" feature. Our survey findings reveal that Hyperledger technologies' features track with features that respondents find most appealing.

Interviewees explored a breadth of features when describing the Hyperledger brand. Bartley focused on why open source is important. "For some organizations, the fact that Hyperledger is open source makes it inherently attractive. I believe there is a perception that open source today as it exists is generally credible. I think it's a benefit that [Hyperledger] is open source

because many organizations are going to evaluate open source as a primary option before supplementing with commercial technologies." For organizations that choose an open-source-first approach to development, explains Bartley, this gives Hyperledger technologies prominence in the market.

Huang, who has experience implementing Hyperledger Fabric for Accenture clients, gave a number of reasons why they would choose Fabric for a client. According to Huang, it has a proven track record that makes it attractive. "Hyperledger Fabric is one of the technologies that has the most proactive contributions and client stories. One of my teams in the Netherlands developed a proof-of-concept with Hyperledger Fabric on cross-country

FIGURE 11

APPEAL OF DIFFERENT BLOCKCHAIN TECHNOLOGY FEATURES

Feature	Extremely appealing	Very appealing	Somewhat appealing	Not very appealing	Not appealing at all	Don't know or not sure
Develops solutions for private and public blockchain solutions	37%	29%	21%	4%	2%	7%
Building better together	36%	35%	15%	4%	2%	7%
Open development model	35%	31%	21%	3%	2%	8%
Enterprise-grade technology	34%	35%	17%	4%	2%	8%
Long track record of success	34%	30%	21%	4%	3%	8%
Provides access to blockchain vendors and partners	32%	39%	17%	2%	3%	7%
The Linux Foundation's umbrella blockchain technology	32%	31%	24%	3%	2%	8%
The home of interoperability	32%	30%	21%	2%	4%	11%
Open governance model	28%	33%	23%	5%	3%	8%

■ Extremely appealing ■ Very appealing ■ Somewhat appealing ■ Not very appealing ■ Not appealing at all ■ Don't know or not sure

Hyperledger Foundation 2023 Brand Study, Q30, Sample size = 265

patient data transfer. And we have loads of other use cases and client applications on Fabric." She also pointed to its versatility, scalability, and applicability that makes it a top choice for a variety of use cases: "One of the key criteria for a blockchain when it comes to enterprise adoption is whether it is scalable and solutions-ready. Fabric is a tool you can use for almost any use case, with so much versatility. Especially when you come over the initial setup hurdle, then you can really customize, depending on what you need. It offers a lot of flexibility. And from very early on it has shown very promising scalability in terms of infrastructure and throughput."

The concept of Hyperledger projects being solutions-ready was also discussed by Day, who gave a detailed account of why they are an important solution for enterprise needs. He linked an ease of spin-up to regulatory, security, and financial concerns that come with other technology options, stating, "Hyperledger represents a credible alternative for enterprises that feel risk-averse and don't wish to use public chains. Or because, for regulatory reasons, they're not allowed to use public chains, or for commercial reasons, the amount of effort involved in using public chains is just too much of a stretch. So if you want to work with Fabric or if you want to work with some of the other [Hyperledger] projects, you can spin that up relatively easily without having to do too much significant regulatory change as well."

Day continued to explain the value of Hyperledger technologies for enterprises. "Where you can streamline and automate processes, that's a general benefit to the organization—reducing costs, reducing complexity, reducing risk, reducing errors, et cetera. Where Hyperledger can help is a few different places. Standardization is one. So, working to existing data standards

or existing technology standards. Two is ease of use. So, providing existing libraries, or consumable technology and applications… so that the burden of effort for the enterprise to stand up an instance on Hyperledger is smaller. And then integrations as well, where Hyperledger integrates with other blockchain technologies and established enterprise technologies." There are important concerns that come with enterprise blockchain development that, according to Day and Huang, are reduced when using Hyperledger.
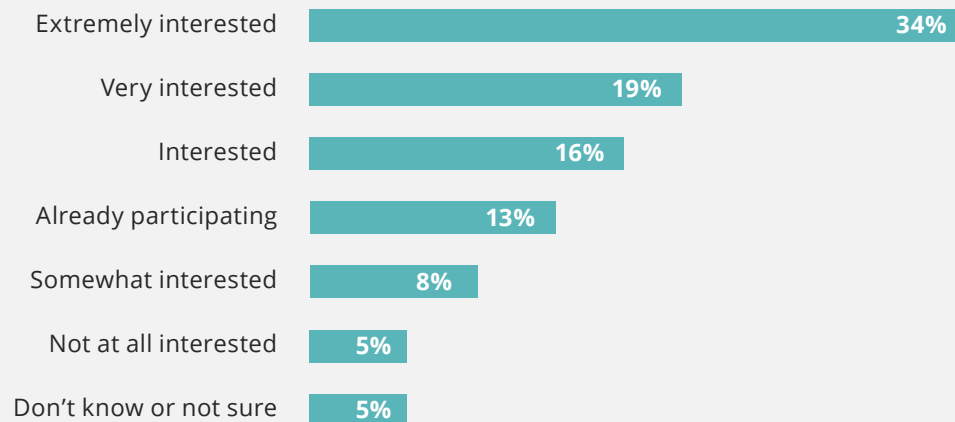
The Hyperledger community represents an important aspect of this simplicity. According to Day, Hyperledger Foundation helps through "education, or the case studies, or the examples where a business stakeholder in an organization can say, hey, this is where I think this can work. Let's go explore it. So early-stage education. Where members of the Hyperledger staff or some of those community members are actually helping out on projects, sharing knowledge, helping with design, helping with implementation, helping with quality assurance." Hyperledger's community is an important asset in implementation, from a collaboration, knowledge-sharing, and training standpoint, but also from its inherent impartiality. Day went on to say:

> "The community that you get with the Hyperledger Foundation is particularly powerful. And I think there's a fairly strong, impartial feeling about Hyperledger. Because it's within Linux, it's an organization that's transparent. It's an organization that's objective. It's not trying to pretend that it's got the best product out there. It's just trying to solve some problems… so, if you're interested in enterprise blockchain, and you want an impartial, shell-free conversation about blockchain, you go to Hyperledger.

That's the positioning, that's the experience that you get, if you're engaging with Hyperledger."

The health of this community depends on the public's willingness to participate. In our survey, we asked participants to express their interest in participating in open source enterprise blockchain projects, which resulted in generally high interest, where 53% of respondents were either very or extremely interested in participating (see **FIGURE 12**).

Respondents gave a range of benefits from this kind of participation, ranking their top three as professional networking, skills development, and staying up to date on trends (see **FIGURE 13**). Not only are there benefits to implementing Hyperledger projects but their open and collaborative nature make it possible to benefit from participation.
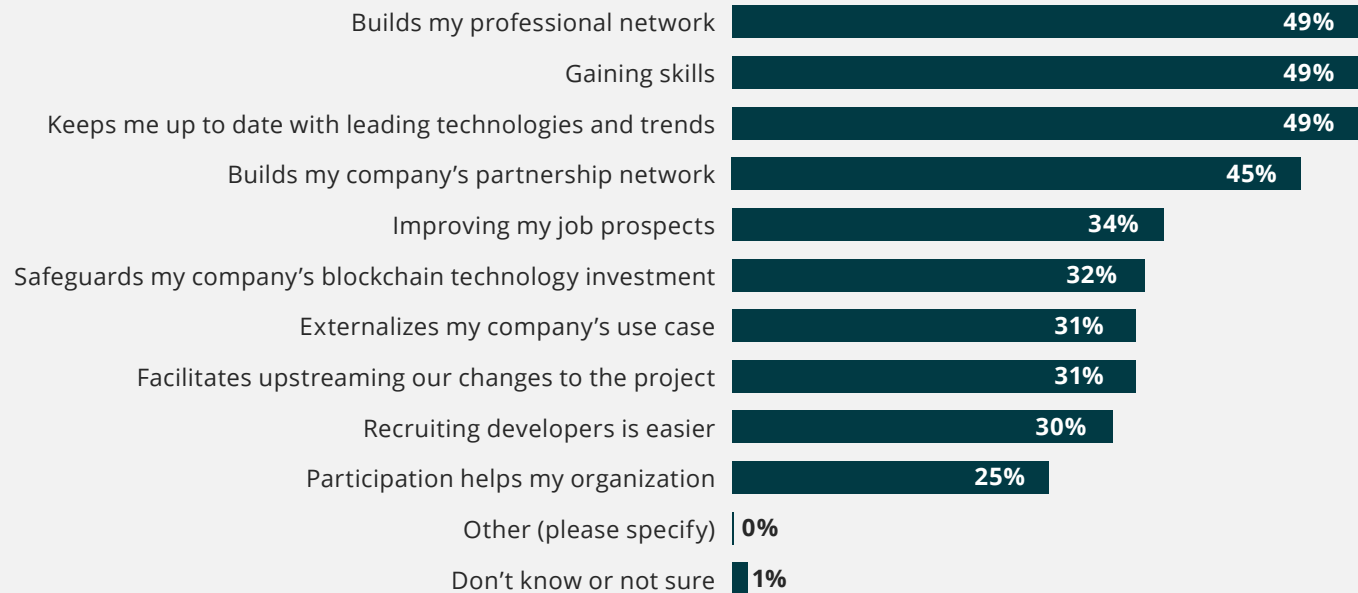
Hyperledger Foundation hosts technologies that, according to our survey respondents, respond to general needs and wants of the public when it comes to enterprise-grade blockchain technology. Its open source and solutions-ready nature and its community support—and the benefits that come from participating in it—make it a viable option for various enterprise applications, as described below.

Use cases and new business models

Beyond the more abstract discussion of the benefits of the technology, our survey sought to understand how the technology has been applied in practice. We asked our respondents to define their organization's blockchain applications by industry category. Supply chain and financial services were the top two application areas, while government & legal and media & entertainment were the bottom two (see **FIGURE 14**). Supply chain and financial services were also the top two in 2021, while government applications dropped from 22% to 10% this year.[4] Notably, the percentage of respondents in government roles

FIGURE 12

LEVEL OF INTEREST IN PARTICIPATING IN OPEN SOURCE ENTERPRISE BLOCKCHAIN PROJECTS

Extremely interested	34%
Very interested	19%
Interested	16%
Already participating	13%
Somewhat interested	8%
Not at all interested	5%
Don't know or not sure	5%

Hyperledger Foundation 2023 Brand Study, Q34, Sample size = 262

FIGURE 13

BENEFITS OF PARTICIPATING IN AN OPEN SOURCE BLOCKCHAIN PROJECT

Builds my professional network	49%
Gaining skills	49%
Keeps me up to date with leading technologies and trends	49%
Builds my company's partnership network	45%
Improving my job prospects	34%
Safeguards my company's blockchain technology investment	32%
Externalizes my company's use case	31%
Facilitates upstreaming our changes to the project	31%
Recruiting developers is easier	30%
Participation helps my organization	25%
Other (please specify)	0%
Don't know or not sure	1%

Hyperledger Foundation 2023 Brand Study, Q35, Sample size = 236, Count = 885

FIGURE 14

BLOCKCHAIN APPLICATIONS BEING DEVELOPED, CATEGORIZED BY INDUSTRY

Supply Chain	42%
Financial Services	37%
Energy & Resources	22%
Identity	21%
Social Impact & Sustainability	18%
Mobility & Transport	16%
Healthcare	14%
Education & Research	14%
Don't know or not sure	11%
Government & Legal	10%
Media & Entertainment	8%
Other (please specify)	3%
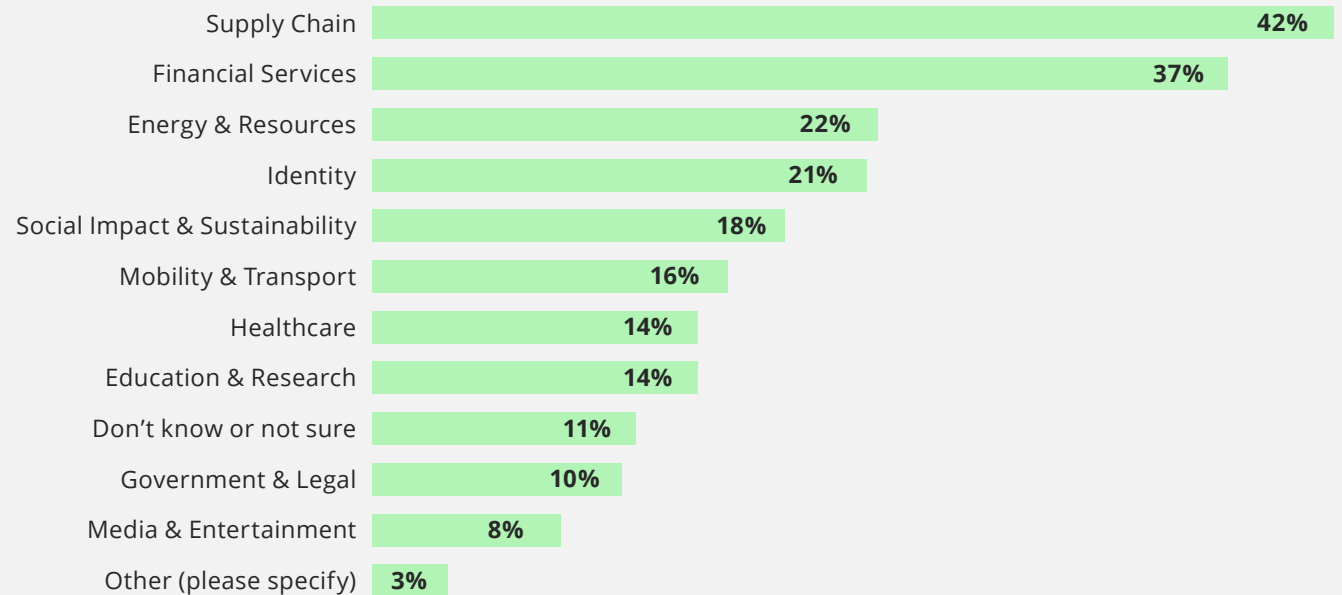
Hyperledger Foundation 2023 Brand Study, Q16, Sample size = 296, Count = 640

only dropped by 1% from 2021 to 2023—from 2% to 1%.

The use cases were fleshed out by our interviewees, who provided a more nuanced picture of these application areas and use cases, including the opportunities and challenges of these applications and what new business models may be emerging. Their comments consolidated around the following as top-of-mind areas:

Supply chain. Madhavji, Bartley, Huang, and Day all commented on the value of blockchain in supply chain applications. As Bartley noted, "there are really good use cases for things like supply chain, anything where you need an indelible, traceable record of provenance." This appeared to be a top industry for interviewees alongside survey respondents.

Identity and credentialing. Day, Bartley, and Madhavji all spoke about identity applications and credentialing. Both Day and Bartley expressed that identity applications have a lot of potential but are also faced with significant challenges. Day commented that digital identity has become meaningful particularly after the pandemic, but that the space "has not progressed as much as others, because the authorities are the gatekeepers for identities and are not particularly fast to give up their authority." Madhavji cited some work his organization has seen in the credentialing space, where "over the last five to six years a lot of companies [have worked] on credentialing," but felt that they "haven't seen big companies really start integrating." To him, it seems this space is moving slower than supply chain applications. This may have to do with a unique set of considerations—including government ownership over identity administration and heightened privacy concerns—that make identity applications more complex than an area like

supply chain.

Tokenization. Huang and Day referenced use cases in tokenization. Huang gave a specific example of tokenization, referring to Accenture's work in tokenizing carbon credits. She commented that this work requires standardization as organizations are designing tokens with different standards, which makes trading challenging. Day argued that tokenization represents one of the major areas of interest for blockchain, with a large range of industry applications. He pointed to the potentially transformative effects of "creating a digital representation of any asset … and then creating a new commercial model around that."

O'Dair and Madhavji also referenced the transformative effects of tokenization on ownership. O'Dair argued, "An NFT … confers some kind of quasi-ownership that we've never had before in the history of copyright," where "things that probably people never even thought of as property before" could be owned or, at least, given a sense of ownership. Madhavji agreed with this, stating, "People miss the point of what an NFT is, but it's the only way in human history to really track ownership in the digital world." Both felt that this application will be long-lasting and continuously growing.

Gaming. Both Madhavji and Day commented on the gaming industry. "There's a lot of saturation, but still a lack of great progress from companies making a big dent in the space," Madhavji expressed. Day also felt that gaming is a "hot industry," but "you're not going to see really great stuff for another two years."

Financial services. Bartley explained the value of using blockchain in transactional industries, citing both supply chain and
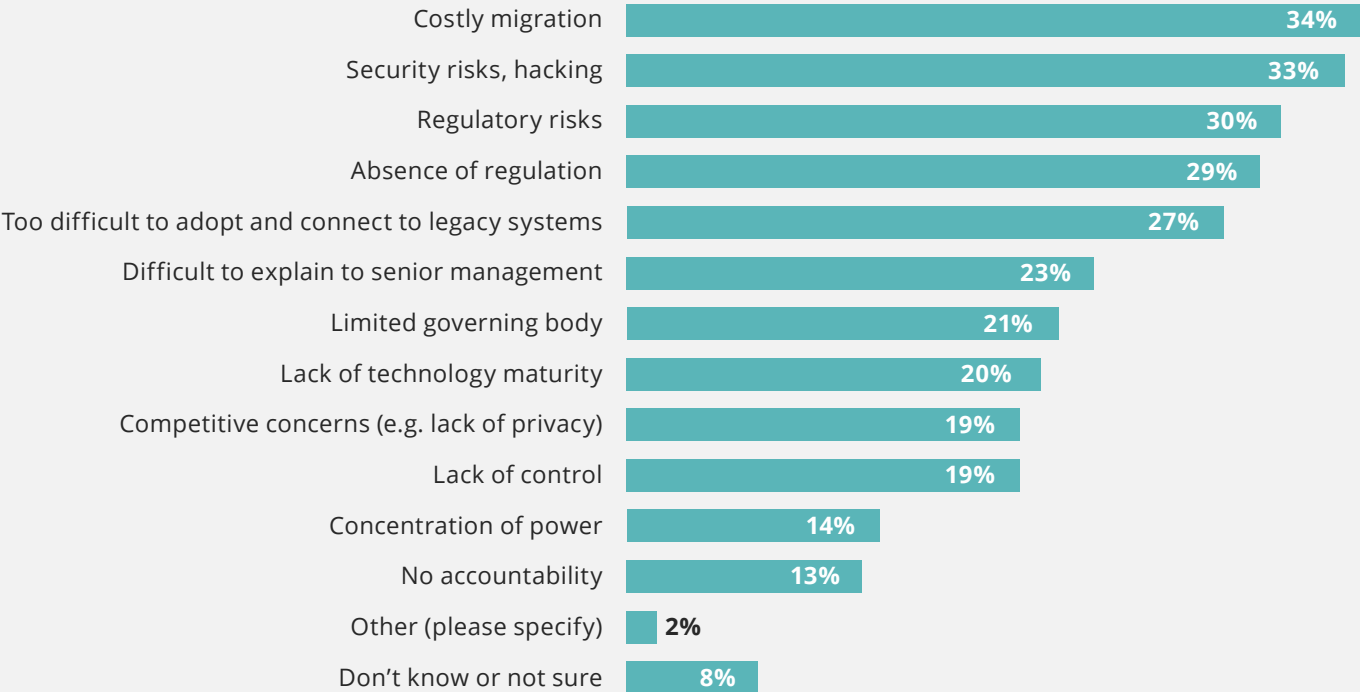
financial services. She noted, "The financial services industry has been motivated to invest in blockchain at a fairly early stage, not necessarily because these systems are being implemented at scale for consumer services yet, but investing in the technology because they see the potential of it."

Artificial Intelligence (AI). As discussed earlier, interviewees felt that part of unlocking blockchain's potential lies at the intersection of different technologies. One significant intersection for our interviewees was with AI. Madhavji felt strongly about AI's potential: "AI is going to change everything. And it'll be integrated into nearly everything. With blockchain, there is going to be a lot of different things you can do at this

intersection." Day gave an example: As AI enables the generation of content and intermediates more processes, "you're going to see a greater need for engineered-in trust, transparency, or validity… AI is only going to increase the need for blockchain's capabilities."

Reviewing blockchain's use cases to date, the technology has the potential to streamline business models or even create entirely new ones. However, there are challenges to progress in these spaces related to standardization, regulation, incumbent resistance, and more, which will be discussed in more detail in the following section.

FIGURE 15

CHALLENGES TO ENTERPRISE-GRADE BLOCKCHAIN ADOPTION

Challenge	Percentage
Costly migration	34%
Security risks, hacking	33%
Regulatory risks	30%
Absence of regulation	29%
Too difficult to adopt and connect to legacy systems	27%
Difficult to explain to senior management	23%
Limited governing body	21%
Lack of technology maturity	20%
Competitive concerns (e.g. lack of privacy)	19%
Lack of control	19%
Concentration of power	14%
No accountability	13%
Other (please specify)	2%
Don't know or not sure	8%

Hyperledger Foundation 2023 Brand Study, Q32, Sample size = 262, Count = 766

Challenges

Despite promising progress and opportunities in the enterprise blockchain space, our findings also point to some significant challenges. Our survey respondents ranked what they perceived to be the most significant challenges to the adoption of enterprise-grade blockchain. Their top three challenges were cost of migration, security risks, and regulatory risks (see **FIGURE 15**). In 2021, lack of technology maturity ranked much higher (58%), as well as the difficulty of explaining to leadership (49%).[4] The fact that our 2023 audience ranked these concerns lower on the list may have something to do with the "NFT effect,"
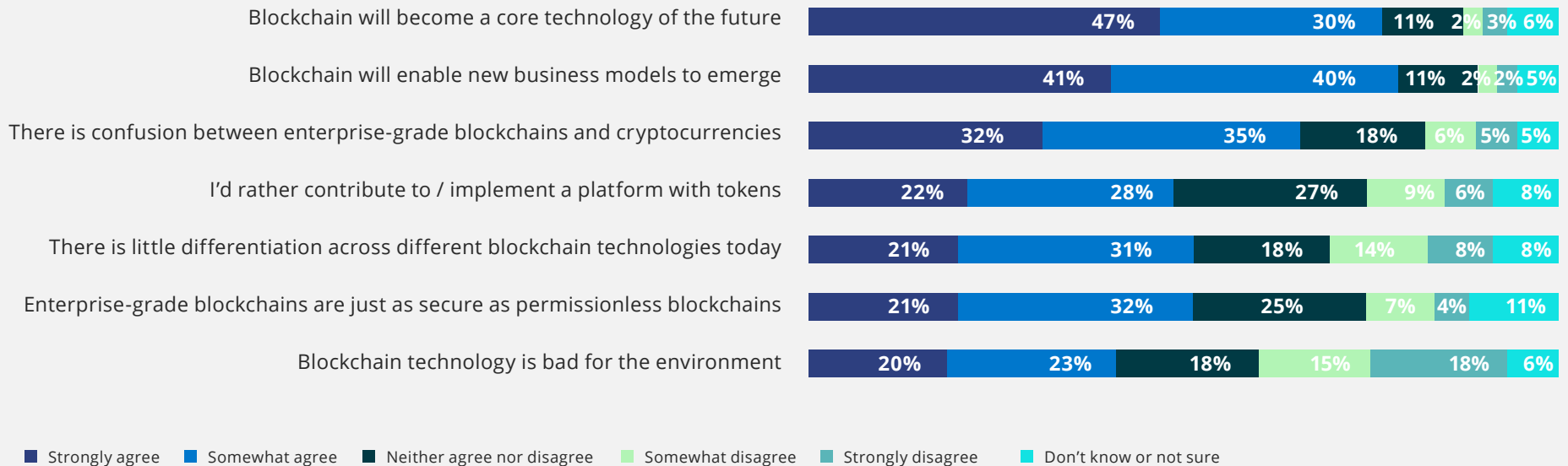
where blockchain has become more mainstream since the NFT phenomenon.

CULTURAL, SOCIAL, AND REGULATORY CHALLENGES

Despite a potentially greater understanding of blockchain, there still appears to be some cultural challenges that slow adoption within existing incumbents. O'Dair pointed to the fear of existing intermediaries being cut out by the disinter-mediation process; Madhavji expressed that corporates have been slow with adoption, and "[we] haven't seen big companies actually start using these things and integrating these things"; and, as discussed earlier, Day argued that digital identity

---

FIGURE 16

AGREEMENT WITH DIFFERENT VALUE STATEMENTS ABOUT BLOCKCHAIN TECHNOLOGY

Statement	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree	Don't know or not sure
Blockchain will become a core technology of the future	47%	30%	11%	2%	3%	6%
Blockchain will enable new business models to emerge	41%	40%	11%	2%	2%	5%
There is confusion between enterprise-grade blockchains and cryptocurrencies	32%	35%	18%	6%	5%	5%
I'd rather contribute to / implement a platform with tokens	22%	28%	27%	9%	6%	8%
There is little differentiation across different blockchain technologies today	21%	31%	18%	14%	8%	8%
Enterprise-grade blockchains are just as secure as permissionless blockchains	21%	32%	25%	7%	4%	11%
Blockchain technology is bad for the environment	20%	23%	18%	15%	18%	6%

■ Strongly agree ■ Somewhat agree ■ Neither agree nor disagree ■ Somewhat disagree ■ Strongly disagree ■ Don't know or not sure

applications were slower than others because governments are the "gatekeepers" of this process and are wary of giving up their authority. The transition from traditional to blockchain-based systems appears to be met with some resistance from incumbents.

Environmental concerns also came up in the survey and in interviews. Forty-three percent of respondents agreed that blockchain is bad for the environment (see FIGURE 16). Bartley expressed that this is a significant drawback for enterprises. "A blockchain's energy use is a key concern for enterprises because they are very sensitive to compute resource consumption, from an environmental perspective but also from a cost perspective. If you're using a blockchain with a proof-of-work system, it's just not feasible to be using it at scale in an enterprise context. One hypothetical example I heard presented a few years ago at a conference stuck with me: if a leading global payment card issuer such as Visa were to theoretically conduct all of its global transations via Bitcoin, it would apparently require more human-produced energy than existed on the planet at the time. And that's just one company, right? So, the organizations looking to use blockchain or distributed ledger technologies are very concerned about cost-efficiency of energy consumption, and this becomes a barrier to adoption." For both enterprises and consumers, blockchain's energy use remains a consideration. The fact that Hyperledger technologies do not use energy-intensive proof-of-work validation makes them an attractive option in response to these concerns.[7]

Security risks and scams were also discussed by our interviewees. As O'Dair commented, there are financial and security risks for individuals involved in a blockchain platform that may not be legitimate, but there are also reputational risks to companies. This exposure to risk is different than it is in traditional systems, he argued, where we understand our rights: "The decentralized and distributed nature of blockchains—at least in the eyes of a crypto maximalist—means that everyone's on their own, good luck. You don't have the same regulation, customer support, consumer rights. We've just got a much better understanding of our rights when we make a purchase with fiat currency." This absence of regulation is a clear concern in our survey data as well (see FIGURE 15).

As our survey respondents articulated, there is not only concern for an absence of regulation but also the risks involved with current regulation. Bartley gives one perspective on this, discussing the inherent problems of complying with privacy regulation when using an append-only, immutable ledger. "When you're dealing with blockchain, you're creating an indelible record, right. And when you're working in an information governance or a privacy sense, that can actually be the problem—it's coming into conflict with some of the current regulations for data privacy that have specific mechanisms for removal of personal information."

It is not always clear where blockchain fits into current regulation, nor how to update regulation to support adoption. This is a focus for Hess, who discussed the challenges of having regulators create legislation without disassociating crypto from enterprise blockchain. "There's an important difference between tech and trading that often gets lost in policymaker discussions around blockchain," he explained. "We need to help educate policymakers to differentiate between crypto and distributed ledger technology if we want to see regulation that supports, not stifles, innovation." Madhavji agreed and gave the enterprise perspective on the consequences of crypto regulation: "We're seeing all of these lawsuits right now

with exchanges—Binance and Coinbase. These types of things scare corporates, because they don't want to get caught in the crossfire of the government. They may be nervous about really doing stuff in this space, or even trying to get publicity in this space. It's just more negative than positive right now." As the 2021 study also found, the potential of restrictive regulation stifles blockchain innovation. This lack of clarity around regulation also relates to the general complexity of the technology.

TECHNICAL COMPLEXITIES, CONFUSION, AND THE IMPACT OF NEGATIVE PERCEPTIONS

Interviewees pointed out the complexities that make blockchain more challenging to use. For example, some interviewees discussed how the foundational features of blockchain are antithetical to our more familiar traditional structures, making it challenging for individuals to understand and adopt. Day commented more generally that "decentralization as a concept to people is hard," while O'Dair focused on the difficulty of grasping NFTs: "I do think that it's quite a strange world to suddenly get involved in if you don't know anything about it at all," he commented. "You don't need to understand the complexities of the underlying architecture, but you do need to understand good practice if you're going to mint or buy a token. How do you know which blockchains to use? How do you know what's suddenly going to disappear? What's potentially a scam? How do you protect your assets?" These comments do not infer an ease of use, particularly when it comes to an individual's integration of the technology into their daily lives.

The gap between a layperson's knowledge of blockchain and their use of the technology was summed up in Bartley's analogy: "The Internet to a consumer was mostly nothing until the World Wide Web was invented. And there was essentially an interface for it, an operating system for the Internet that was accessible and navigable to a consumer. We currently don't have an obvious equivalent right now for blockchain." Asking an individual to understand blockchain without the infrastructure or best practices in place can be a tall order, making it a challenging technology to integrate. This complexity can lead to confusion.

This confusion is highlighted in discussions of the relationship between enterprise blockchain and crypto. Two-thirds (67%) of our survey respondents agreed that there is confusion between enterprise-grade blockchains and cryptocurrencies (see **FIGURE 16**). Bartley explained why this might be the case, stating, "until enterprises start using these technologies more frequently, in use cases that are tangible and directly visible to customers, I think the consumer perception is going to remain that blockchain essentially equals Bitcoin." However, this confusion is less significant than it was in the 2021 study, where 85% of respondents agreed.[4] This trend manifests in the signals from larger, established institutions that are endorsing the technology's long-term value as opposed to focusing on crypto.[8,9]

Even still, this association could be damaging and distracting, according to some of our interviewees. As Day explained, the volatility of crypto and the scams associated with it lead to a weariness in the general public. "Unfortunately, the more scandalous or sexy or extreme versions of what blockchain technology can do are what get publicized. Whereas the more mundane, less interesting, but hugely more valuable elements of financial reporting, settlement and reconciliation, administration of credentials, et cetera, that nobody in the world cares about, but that costs the world billions of dollars, that's the stuff that we need the technology for." Hess agreed, summing

up the issue succinctly: "Crypto is a tainted brush." Bartley also discussed the negative implications of crypto weariness on enterprise adoption. "There's a high level of caution and weariness around [blockchain technologies], because individuals associate them with cryptocurrencies and illegal activity. In the enterprise space, that's not what these technologies are really being used for. But there is a consumer perception that blockchain equals Bitcoin. And we need to get past that hurdle before consumers start to even understand that these are complex technologies that are changing day by day." This negative association can make it harder for enterprises to adopt and implement blockchain solutions when it comes to investment, development, and/or customer adoption.

From an enterprise perspective, there is a technical as well as cultural complexity that can make it hard to adopt. As Huang pointed out, the novelty of the technology is a barrier to adoption. "On the technical side, the initial steps of setting up the Hyperledger Fabric environment were always a big hurdle," she explained, in reference to Accenture's work implementing enterprise-grade blockchain for clients. "And most of the time we're saying that for this small or simple use case, you actually spend more than 50% of your effort for the first six weeks just setting up the right environment." This complexity does not always have to do with its technical novelty but also the legal and jurisdictional complexity of tracking custody and transactions.

Bartley described the challenges of blockchain adoption when faced with its novelty. She connects this to adoption challenges by the way that enterprise decisions often need evidence of a proven record to allocate budget. "For organizations, one of the main barriers is the concern around cost efficiencies. There are really good use cases in [provenance and lineage], but there's a struggle to justify adoption and the potential expense of these technologies when organizations have not really thought of other use cases that are not proven yet… If there's a lot of excitement around a new technology, an organization will allocate budget toward it. But then as that excitement dies down, and there's a lack of proven use cases, organizations may pull that budget. Cultural variables are often barriers as much as any sort of technical issue."

As discussed above, blockchain adoption is experiencing some stalls, which makes proving its record more difficult. These stalls are related to this constellation of challenges: cultural resistance, environmental and security concerns, regulatory barriers, knowledge gaps, technical complexities, and negative perceptions of the technology. In order to move the space forward, there are opportunities for Hyperledger Foundation and its project communities to help the enterprise blockchain community overcome these challenges. These opportunities are discussed in the final section.
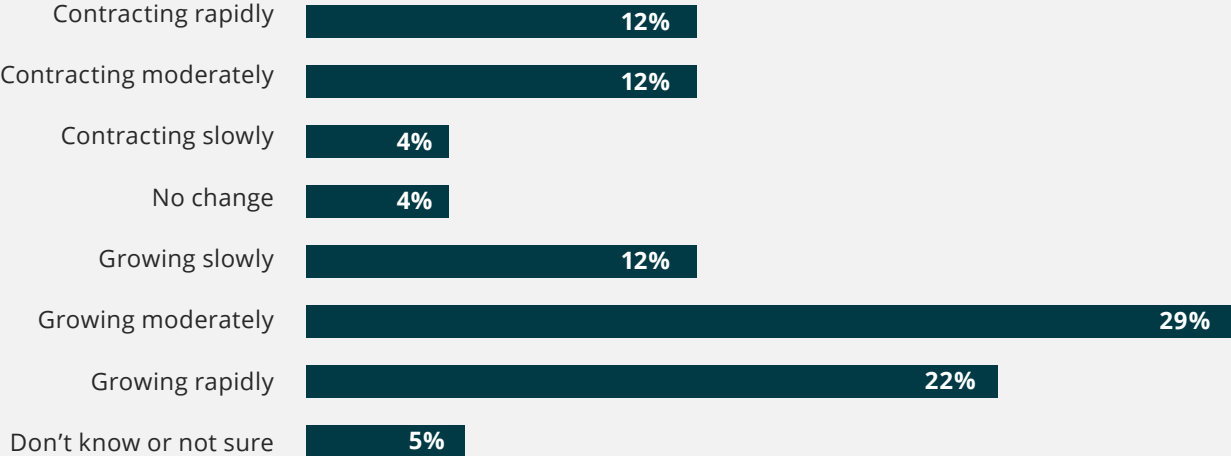
CONCLUSIONS: LOOKING TO THE FUTURE

Amid all the findings described above, our research participants provided insight that can help us understand what the near- and longer-term future might look like for enterprise blockchain. This includes perceptions on future trends in adoption and development, the sustainability of use cases, and where Hyperledger Foundation fits into this picture.
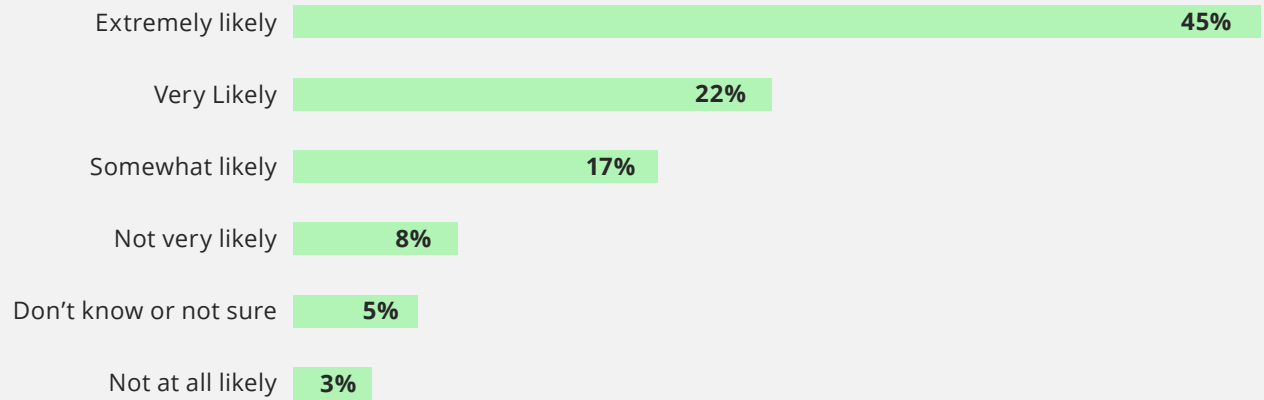
Digital transformations take time

We asked our survey respondents for their predictions of adoption and development over the next two years. More than half (51%) of respondents predicted moderate to rapid growth over the next two years (see FIGURE 17), and 45% felt it was extremely likely their organization would adopt blockchain in the next two years (see FIGURE 18)—in fact, the majority of respondents (61%) felt their organizations would be ready to deploy blockchain technology within a year (see FIGURE 19).

FIGURE 17

PREDICTIONS OF BLOCKCHAIN TRENDING OVER THE NEXT TWO YEARS

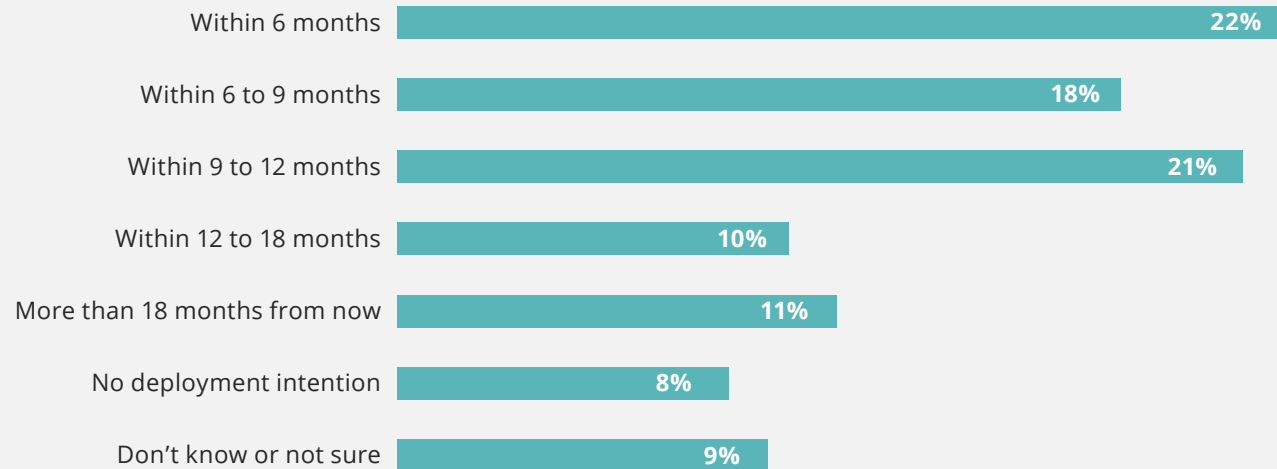|	
Contracting rapidly	12%
Contracting moderately	12%
Contracting slowly	4%
No change	4%
Growing slowly	12%
Growing moderately	29%
Growing rapidly	22%
Don't know or not sure	5%

Hyperledger Foundation 2023 Brand Study, Q18, Sample size = 274

FIGURE 18

LIKELIHOOD OF BLOCKCHAIN ADOPTION IN THE NEXT TWO YEARS

Extremely likely	45%
Very Likely	22%
Somewhat likely	17%
Not very likely	8%
Don't know or not sure	5%
Not at all likely	3%

Hyperledger Foundation 2023 Brand Study, Q12, Sample size = 298

FIGURE 19

TIMELINE OF ORGANIZATIONAL READINESS TO ADOPT

Within 6 months	22%
Within 6 to 9 months	18%
Within 9 to 12 months	21%
Within 12 to 18 months	10%
More than 18 months from now	11%
No deployment intention	8%
Don't know or not sure	9%

Hyperledger Foundation 2023 Brand Study, Q27, Sample size = 265

The general consensus from both survey respondents and interviewees is that blockchain represents a form of digital transformation. Three-quarters (77%) of our survey respondents agreed that blockchain will become a core technology of the future, and 81% agreed that blockchain will enable new business models to emerge (see FIGURE 16).

The new paradigm—and the time it will take to achieve it—seems to appear in the data as well. Our survey respondents predicted more and faster growth in 2021 than in 2023, where 52% predicted rapid growth, and only 3% predicted rapid contraction. However, in 2021, only 2% felt it was extremely likely that their organization would adopt blockchain.[4] Now, in 2023, that number has risen to 45%, and the uncertainty of adoption has also dropped dramatically (from 28% in 2021 to 5% in 2023). Respondents also felt that their organizations are closer to being ready to deploy in the 2023 report than in the 2021 report, where only 37% said they would be ready to deploy within a year (compared with this year's 61%). Similar to the findings above, these data may be further substantiating some progress in the hype cycle.

O'Dair commented on the idea that blockchain represents a digital transformation. As discussed above, he sees significant transformation in the way NFTs changed the conversation around intellectual property: "We're used to the idea that a digital work can be copied an infinite number of times, without any degrading of quality or whatever. To introduce uniqueness into that world is potentially transformative." However, he goes on to describe the practicalities and realities of industry transformation. "The more you think of blockchains as being

potentially transformative, and the more you think of them as being potentially a new paradigm, the more you think that actually that sort of change doesn't happen quickly... There are a lot of bold claims made for this technology, like many new technologies—it's going to transform everything, it's going to disrupt everything. But actually, I think what you see is that, for various reasons, that's not what happens. The existing players and powers don't just suddenly disappear." Day agrees, stating that this kind of transformation takes time. "In all of these transformations, they're relatively slow or long," he argues. As the space matures, it doesn't necessarily speed up the time to transformation. But he sees the increasing usability of and collaboration on technology tools as a representation of maturity and ultimately as an indicator of digital transformation.

SUSTAINABILITY

According to interviewees, one important marker of digital transformation and maturity is which applications make it through the hype cycle. O'Dair commented on this in relation to the NFT phenomenon, stating, "it's brilliant while it lasts, at least for those few artists making a lot of money, but if it's funded through speculation, then it's not really sustainable." He went on to describe how, with any digital transformation, "what you always see is that... the use cases that really add value are the ones that endure." Huang agreed with this sentiment, with the belief that the "real" applications will stay. Day also took to the NFT market to describe his feelings around sustainability, arguing that there are companies that simply spin up a metaverse in a sandbox, and then there are companies that build a community around their metaverse. "If you change the

financial or commercial model of how that group makes money, if you change the place or the features of what those customers get to experience from [the company] when you're there, then you start to create a more sustainable innovation."

Moving Hyperledger Foundation forward

As this research has revealed, there are many aspects of enterprise blockchain that make it challenging to implement, such as cultural concerns, technical complications, news cycles, and negative associations that distract from what this technology can accomplish. Technology officers, developers, and other enterprise leaders still have an uphill battle to overcome these cultural and technological complexities, the regulation that inhibits development, and the concerns over security. As our interviewees stated, this process is not linear, and it is not moving particularly quickly.

Despite these challenges, this research shows progress through the hype cycle of this technology. The findings have articulated momentum away from an understanding correlated with hype to a more grounded understanding of the technology, giving space for applications to develop that represent the best use cases for the technology as well as how it might best interact with other existing and emerging technologies.

When it comes to Hyperledger projects, our findings show that the technologies are valued considerations for enterprise. Individuals are planning to use it (see FIGURE 8), its features align with what was considered most important to our respondents (see FIGURE 11), and it has some characteristics and

opportunities that can help the community overcome some of these ecosystem challenges.

Hyperledger Foundation has several opportunities to grow its community, attract users, and create a more advantageous environment for enterprise blockchain adoption. First, as Hess described, the regulatory space is challenged by its association of crypto with enterprise-grade blockchain. Hyperledger Foundation's neutrality and community base lend themselves to productive engagement with regulators and policymakers. Hyperledger Foundation has and can develop the tools to educate and advise on legislation to meet regulators' concerns while creating a more friendly regulatory landscape for enterprise blockchain.

Second, it is clear from our research that the complexities of blockchain are still a significant challenge for adoption, from both a technical standpoint and a cultural standpoint. Building and maintaining simplifying tools and migration support are important indicators of usability and developer interest in the technology. As Day explains, "Developer experience and integrations are important. The easier we make it for enterprise builders to build, the more likely things are to get adopted. If we can create better front end, better integration, better user experience for enterprise developers, then we'll see usage and adoption." Hyperledger's solutions-ready approach and versatility and its community of developers make it a relevant option to help reduce complexity at the enterprise level.

Third, a large number of respondents indicated that they were not at all familiar with some of Hyperledger Foundation's projects. This finding persists from the 2021 study, where survey respondents and interviewees cited confusion around

the different project offerings.[4] Although Hyperledger is one of the better-known technologies listed in our survey (see **FIGURES 4** and **6-8**), our survey shows that its projects are not as well known as the wider brand. This may mean that those respondents who are evaluating or already implementing Hyperledger technologies may not be considering the breadth of projects to their full potential. It may also mean that respondents have not yet grasped its newer positioning as an umbrella foundation, communicated by the 2021 rebranding to Hyperledger Foundation. Wider education about these projects could lead to better understanding of this community, reduce complexity, and support more effective engagement with the different projects.

Finally, the Hyperledger community can work to increase diversity in the broader ecosystem. As a snapshot of the wider enterprise blockchain community, this study's sample of survey respondents hints at where diversity can be improved. As is evident in **TABLE 1**, there is work to be done to encourage broader representation across gender, sexuality, racial, and ability lines. Further research should explore the effectiveness of Hyperledger Foundation's DEI efforts and how it might attract more diverse developers, business leaders, and other stakeholders into its community.

Acknowledgements

About the author

Anna is the Ecosystem Manager for Linux Foundation Research, where she supports end-to-end management of the Linux Foundation's research projects. She has conducted qualitative and systematic review research in health data infrastructure and the integration of new technologies, such as blockchain, to better support data sharing in healthcare. Her interests lie at the intersection of health informatics, blockchain, and data sharing. Prior to the Linux Foundation, she worked for two different research programs: the Blockchain Research Institute and BC Cancer's Research Institute. She received both her Master of Science in Public Health and her Bachelor of Arts in International Relations from the University of British Columbia.

Endnotes

1   Arijit Sarkar, "Rewind 2022: A crypto roundup of the year and stepping into 2023," Cointelegraph. Published Jan 1, 2023. Accessed August 22, 2023. **https://cointelegraph. com/news/rewind-2022-a-crypto-roundup-of-the-year-and-stepping-into-2023**

2   Matt Coolidge, "Five Takeaways from SALT NYC," Casper Labs. Published May 23, 2023. Accessed August 22, 2023. **https://www.casperlabs.io/blog/five-takeaways-from-salt-nyc**

3   Anthony Day, Host, "S3E12: Hyperledger Hype w. Daniela Barbosa (Exec Director, Hyperledger Foundation)," Blockchain Won't Save the World. Published April 28, 2023. Accessed August 22, 2023. **https://podcasters.spotify.com/pod/show/blockchainwstw/episodes/S3E12-Hyperledger-Hype-w--Daniela-Barbosa-Exec--Director--Hyperledger-Foundation-e235979**

4   Marcus O'Dair, "Enterprise Blockchain and the Hyperledger Brand: Challenges and Opportunities," Foreword by Brian Behlendorf, The Linux Foundation, October 2021.

5   "Technology Trends," Accenture. Accessed August 21, 2023. **https://www.accenture.com/ca-en/insights/technology/technology-trends-index**

6   "Metaverse Continuum," Accenture. Accessed August 21, 2023. **https://www.accenture.com/us-en/services/metaverse-index**

7   Alan Majer, "The Carbon Footprint of NFTs: Not All Blockchains Are Created Equal," foreword by Daniela Barbosa, The Linux Foundation, April 2022.

8   David Solomon, "Blockchain Is Much More Than Crypto," Wall Street Journal. Published Dec 6, 2022. Accessed Oct 17, 2023. **https://www.wsj.com/articles/blockchain-is-much-more-than-crypto-david-solomon-goldman-sachs-smart-contracts-11670345993**

9   Robin Vince, "Time for a reset of the crypto opportunity," Financial Times. Dec 1, 2022. Accessed Oct 17, 2023. **https://www.ft.com/content/5568bd6b-99df-4c8b-91bc-e0b49011da80**

APPENDIX

Survey responses

QUESTIONS	COUNT	PERCENTAGE
q0001: How would you describe your familiarity with blockchain technology? (select one)		
Very familiar	112	38%
Extremely familiar	95	32%
Somewhat Familiar	63	21%
Not very familiar	28	9%
Don't know or not sure	0	0%
Not at all familiar	0	0%
Total	298	
q0002: Which one statement best describes blockchain technology? (select one)		
A component that can be used to create a distributed database that multiple companies can securely interact with	111	37%
A cryptographic data structure that can be shared between multiple entities	105	35%
Groups of transactions that reference prior transactions to create an auditable history	71	24%
A tool to bypass regulations and avoid law enforcement agencies	11	4%
Don't know or not sure	0	0%
A network that will eventually replace banks	0	0%
Bitcoin	0	0%
Total	298	
q0003: What is your current employment status? (select one)		
Employed, full time	271	91%
Self-employed, full or part time	19	6%
Employed, part time	8	3%
Don't know or not sure	0	0%
Student, full time or part time	0	0%
Recent graduate but not yet employed	0	0%
Unemployed but previously employed and looking for work	0	0%
Unemployed and not currently looking for work	0	0%
Retired	0	0%
Total	298	

QUESTIONS	COUNT	PERCENTAGE
q0004: Which response best describes you? (select one)		
I am a real person	298	100%
Don't know or not sure	0	0%
I'm just lines of code	0	0%
I am a bot	0	0%
I just want to mess with the researchers	0	0%
Total	298	
q0005: In which region do you reside? (select one)		
Europe (eastern or western, excluding Russia)	91	31%
North America (U.S. / Canada)	90	30%
India	40	13%
China	36	12%
Asia (except China, India, Japan, Russia, and Oceania)	17	6%
Japan	7	2%
South America	5	2%
West and central Africa	4	1%
Other (please specify)	3	1%
Mexico, Central America, and the Caribbean	1	0%
Middle East	1	0%
North Africa	1	0%
Eastern and southern Africa	1	0%
Oceania (including Australia and New Zealand)	1	0%
Total	298	
q0006: Which of the following best describes your title? (select one)		
Manager	81	27%
Director	58	19%
Technician / engineer	47	16%
Chief Technology Officer (CTO)	27	9%
Other (please specify)	19	6%
Analyst	18	6%
Vice President	17	6%
Chief Executive Officer (CEO)	14	5%
Network architect / administrator	9	3%
Chief Financial Officer (CFO)	4	1%

QUESTIONS	COUNT	PERCENTAGE
Other C-level	4	1%
Chief Strategy Officer (CSO)	0	0%
Total	298	
q0007: Which of the following best describes your role? (select one)		
IT Management	94	32%
IT Development	66	22%
IT Operations	31	10%
Project Management	20	7%
Product Development	16	5%
Other (please specify)	15	5%
IT Consultant	14	5%
Finance	8	3%
Customer Success	7	2%
Business Development	7	2%
IT Other	6	2%
Marketing	6	2%
Management Consultant	6	2%
Legal	2	1%
Total	298	
q0008: Counting all locations where your employer operates, what is the total number of people who work at your company? Your best estimate is fine. (select one)		
1,000–4,999	97	33%
500–999	41	14%
5,000–9,999	40	13%
More than 30,000	29	10%
0–99	28	9%
10,000–19,999	28	9%
100–499	18	6%
20,000–30,000	14	5%
Don't know or not sure	3	1%
Total	298	
q0009: What is your organization's industry? (select one)		
Information Technology	73	24%
Manufacturing	60	20%

QUESTIONS	COUNT	PERCENTAGE
Financial Services (Banking / Insurance / Securities)	33	11%
Construction / Engineering	16	5%
Retail	16	5%
Healthcare	16	5%
Business Services (accounting, consulting, legal, other)	13	4%
Education	13	4%
Telecommunications / ISP / Web Hosting	10	3%
Professional Services	10	3%
Other (please specify)	9	3%
Transportation & Logistics	7	2%
Life Sciences (biotech, pharmaceuticals, etc.)	5	2%
Oil & Gas / Energy	5	2%
Government (Federal / National)	4	1%
Media (broadcast communications, entertainment, publishing, web, social networking, etc.)	3	1%
Consumer Packaged Goods	2	1%
Utilities	2	1%
Wholesale	1	0%
Government (State / Province / County / Municipal or other local government)	0	0%
Total	298	
q0010: How would you describe your familiarity with Hyperledger technologies? (select one)		
Very familiar	91	31%
Somewhat familiar	87	29%
Extremely familiar	55	18%
Not at all familiar	34	11%
Not very familiar	31	10%
Total	298	
q0011: Which of the following best describes your organization when it comes to enterprise-grade blockchain technologies? (select one)		
Already has implemented or is currently implementing blockchain technologies	110	37%
Currently evaluating or testing blockchain technologies	76	26%
Blockchain technologies are not currently on our radar screen	45	15%
Have discussed blockchain technologies	39	13%
Accepts cryptocurrency as a payment mechanism	17	6%
Don't know or not sure	11	4%
Total	298	

QUESTIONS	COUNT	PERCENTAGE
q0012: If blockchain is NOT yet being considered, how likely is it that your organization will evaluate enterprise-grade blockchain technologies in the next two years? (select one)		
Extremely likely	133	45%
Very likely	66	22%
Somewhat likely	50	17%
Not very likely	23	8%
Don't know or not sure	16	5%
Not at all likely	10	3%
Total	298	
q0013: Which of the following describes the extent to which you are involved in decisions around blockchain within your firm? (select one)		
I have significant influence or decision-making authority (individually or as part of a group) regarding blockchain	160	54%
I have some influence or input into decisions (individually or as part of a group) regarding blockchain	79	27%
I am not involved in blockchain decision-making	28	9%
I have little or no influence or input on decisions regarding blockchain	26	9%
Don't know or not sure	3	1%
Total	296	
q0014: Do you or will you have hands-on experience developing applications for blockchain technologies? (e.g., supply chain tracking, asset tracking, cryptocurrency payments) (select one)		
Yes	204	69%
No	70	24%
Don't know or not sure	22	7%
Total	296	
q0016mrv: Which of the following best categorize the blockchain application(s) being developed or deployed within your organization? (select all that apply)		
Don't know or not sure	34	11%
Education & Research	41	14%
Energy & Resources	64	22%
Financial Services	110	37%
Government & Legal	30	10%
Healthcare	42	14%
Identity	62	21%
Media & Entertainment	24	8%
Mobility & Transport	47	16%
Social Impact & Sustainability	52	18%

QUESTIONS	COUNT	PERCENTAGE
Supply Chain	125	42%
Other (please specify)	9	3%
Total		
q0018: In which direction do you see enterprise-grade blockchain technology trending over the next two years? (select one)		
Growing moderately	79	29%
Growing rapidly	59	22%
Contracting moderately	34	12%
Contracting rapidly	33	12%
Growing slowly	33	12%
Don't know or not sure	13	5%
No change	12	4%
Contracting slowly	11	4%
Total	274	
q0026: Which of the following best describes the stage of development your organization is in with regard to blockchain technology? (select one)		
Production deployment	89	34%
Proof of concept	44	17%
Field trials	43	16%
No development intention	32	12%
Stalled post-pilot	23	9%
Pre-proof of concept	22	8%
Don't know or not sure	12	5%
Total	265	
q0027: If your organization is not yet deploying blockchain technology, how long do you think it will be before it is ready to do so? (select one)		
Within 6 months	59	22%
Within 9 to 12 months	56	21%
Within 6 to 9 months	48	18%
More than 18 months from now	29	11%
Within 12 to 18 months	26	10%
Don't know or not sure	25	9%
No deployment intention	22	8%
Total	265	

QUESTIONS	COUNT	PERCENTAGE
q0028mrv: Which of these technologies are most likely to be considered, evaluated, or implemented within your organization? (select all that apply)		
Don't know or not sure	38	14%
Hyperledger	132	50%
Ethereum	102	38%
Hedera	43	16%
ConsenSys Quorum	32	12%
Corda	45	17%
Hyperledger Fabric	82	31%
Algorand	28	11%
Polygon	55	21%
Digital Asset	43	16%
Hyperledger Iroha	43	16%
Cardano	40	15%
Hyperledger Indy	50	19%
Hyperledger Besu	45	17%
Casper	32	12%
Total		
q0029mrv: Which Hyperledger tools are likely to be considered, evaluated, or implemented by your organization within the next 12 months? (select all that apply)		
Don't know or not sure	64	24%
Hyperledger AnonCreds	48	18%
Hyperledger Aries	82	31%
Hyperledger Bevel	63	24%
Hyperledger Cacti	54	20%
Hyperledger Explorer (now a Lab)	70	26%
Hyperledger Firefly	72	27%
Hyperledger Solang	65	25%
None of the above	22	8%
Total		
q0031mrv: What do you see as the main benefits of enterprise-grade blockchain technologies? (select up to five responses)		
Don't know or not sure	14	5%
Creating new revenue sources	75	29%

QUESTIONS	COUNT	PERCENTAGE
Reducing operating costs	112	43%
Auditability—creation of an append-only audit trail	83	32%
Overall efficiency	117	45%
Creating a single source of truth among multiple participants / elimination of reconciliation	85	32%
Quality assurance with traceability of goods or transactions	124	47%
Ability to share data with a greater degree of security	93	35%
Software standards to keep everyone in the shared ecosystem in sync with transparent, verifiable ledger entries	103	39%
Decentralized databases to increase accountability, even in instances where the individual actors may not be trusted	88	34%
Other (please specify)	1	0%
Total		
q0032mrv: What do you see as the most significant challenges to the adoption of enterprise-grade blockchain technology? (select up to five responses)		
Don't know or not sure	21	8%
Difficult to explain to senior management	59	23%
Too difficult to adopt and connect to legacy systems	72	27%
Costly migration	89	34%
No accountability	34	13%
Absence of regulation	75	29%
Limited governing body	56	21%
Concentration of power	36	14%
Lack of control	49	19%
Security risks, hacking	86	33%
Regulatory risks	79	30%
Competitive concerns (e.g., lack of privacy)	51	19%
Lack of technology maturity	53	20%
Other (please specify)	6	2%
Total		
q0034: How interested would you be in participating in an open source project that develops enterprise-grade blockchain technologies? (select one)		
Extremely interested	89	34%
Very interested	50	19%
Interested	42	16%
Already participating	33	13%
Somewhat interested	22	8%
Don't know or not sure	13	5%

QUESTIONS	COUNT	PERCENTAGE
Not at all interested	13	5%
Total	262	
q0035mrv: What do you see as the benefits of participating in an open source project? (select all that apply)		
Don't know or not sure	2	1%
Externalizes my company's use case	74	31%
Builds my professional network	116	49%
Builds my company's partnership network	106	45%
Keeps me up to date with leading technologies and trends	115	49%
Recruiting developers is easier	70	30%
Safeguards my company's blockchain technology investment	76	32%
Gaining skills	116	49%
Improving my job prospects	80	34%
Facilitates upstreaming our changes to the project	72	31%
Participation helps my organization	58	25%
Other (please specify)	0	0%
Total		
q0037: Do you identify as a person with a dis/ability? For the purpose of this survey, we define dis/ability as a long-term physical, mental, intellectual, or sensory impairment which, in interaction with various attitudinal and environmental barriers, hinders you.		
No	214	83%
Yes	38	15%
Prefer not to answer	5	2%
Total	257	
q0038mrv: With which racial background(s) do you identify? (if multiracial, select all that apply) (this question is optional)		
Prefer not to answer	9	3%
Asian	94	36%
Black	18	7%
Hispanic/Latinx	14	5%
Native or Indigenous	4	2%
Pacific islander	2	1%
White	128	49%
Other (please specify)	2	1%
Total		

QUESTIONS	COUNT	PERCENTAGE
q0039: What is your gender? (select one) (this question is optional)		
Man	168	65%
Woman	83	32%
Other (please specify)	8	3%
Non-binary / third gender	0	0%
Total	259	
q0040: Do you consider yourself to be gender non-conforming, gender diverse, gender variant, or gender expansive? (select one) (this question is optional)		
No	221	88%
Yes	16	6%
Prefer not to answer	14	6%
Questioning	1	0%
Total	252	
q0041: Do you consider yourself to be transgender? (select one) (this question is optional)		
No	242	94%
Yes	8	3%
Prefer not to answer	7	3%
Questioning	0	0%
Total	257	
q0042mrv: What is your sexual orientation? (select all that apply) (this question is optional)		
Prefer not to answer	19	7%
Asexual	7	3%
Bisexual	21	8%
Gay	4	2%
Heterosexual or straight	199	78%
Questioning	1	0%
Lesbian	1	0%
Pansexual	2	1%
Queer	0	0%
If none of the above, please specify	1	0%
Total		

q0020gv: When it comes to enterprise-grade blockchain, how familiar are you with the following brands?	Don't know or not sure	Not at all familiar	Only heard the name	Somewhat familiar	Familiar	Very familiar
Hyperledger	1%	8%	12%	22%	25%	31%
Ethereum	3%	11%	6%	19%	21%	40%
Hedera	7%	32%	17%	12%	16%	15%
ConsenSys Quorum	5%	33%	17%	13%	18%	15%
Corda	5%	30%	15%	16%	19%	15%
Hyperledger Fabric	4%	20%	15%	19%	19%	23%
Algorand	6%	30%	19%	12%	20%	13%
Polygon	5%	17%	19%	17%	18%	23%
Digital Asset	5%	21%	11%	17%	22%	23%
Hyperledger Iroha	4%	28%	16%	15%	20%	18%
Cardano	5%	27%	11%	18%	17%	22%
Hyperledger Indy	5%	32%	15%	14%	20%	14%
Hyperledger Besu	5%	30%	16%	18%	15%	16%
Casper	8%	30%	20%	13%	16%	13%

q0021gv: Which of the following best describes each brand?	Don't know or not sure	Open source consortium	Collaborative project	Blockchain platform	Cryptocurrency
Hyperledger	16%	19%	16%	40%	9%
Ethereum	14%	5%	10%	32%	39%
Hedera	41%	6%	17%	26%	9%
ConsenSys Quorum	38%	10%	12%	30%	9%
Corda	35%	6%	12%	35%	11%
Hyperledger Fabric	28%	9%	22%	30%	11%
Algorand	35%	8%	13%	31%	14%
Polygon	32%	8%	14%	31%	16%
Digital Asset	33%	7%	14%	22%	23%
Hyperledger Iroha	37%	10%	17%	30%	6%
Cardano	31%	8%	10%	29%	22%
Hyperledger Indy	36%	13%	13%	29%	9%
Hyperledger Besu	36%	9%	17%	28%	10%

	Don't know or not sure	Very negative	Somewhat negative	Neutral	Somewhat positive	Very positive
Casper	44%	4%	16%	26%	10%	

q0022gv: What are your perceptions of each of the following brands?	Don't know or not sure	Very negative	Somewhat negative	Neutral	Somewhat positive	Very positive
Hyperledger	7%	2%	1%	19%	32%	39%
Ethereum	8%	1%	4%	14%	32%	40%
Hedera	25%	1%	4%	24%	22%	24%
ConsenSys Quorum	28%	3%	4%	21%	24%	21%
Corda	24%	1%	2%	25%	24%	24%
Hyperledger Fabric	16%	1%	3%	19%	29%	32%
Algorand	25%	2%	5%	26%	22%	21%
Polygon	21%	1%	4%	20%	26%	29%
Digital Asset	21%	2%	2%	18%	26%	31%
Hyperledger Iroha	25%	2%	3%	19%	26%	25%
Cardano	22%	2%	4%	19%	24%	28%
Hyperledger Indy	24%	1%	3%	21%	24%	28%
Hyperledger Besu	23%	1%	3%	19%	28%	25%
Casper	28%	2%	2%	20%	25%	23%

q0025gv: How effectively do the following statements describe Hyperledger?	Don't know or not sure	Does not describe at all	Describes somewhat	Describes completely
Enterprise-grade technology	9%	3%	30%	57%
Open source	9%	2%	31%	58%
Open governance model	15%	6%	36%	43%
Open development model	13%	4%	33%	50%
The Linux Foundation's umbrella blockchain project	14%	4%	30%	52%
Has well-established use cases	15%	5%	34%	46%
Is part of a non-profit foundation	18%	7%	29%	46%
Trusted technology	12%	3%	26%	59%
Evolves to meet new demands	14%	3%	32%	51%
Develops production-ready technologies	12%	5%	36%	47%

	Don't know or not sure	Not appealing at all	Not very appealing	Somewhat appealing	Very appealing	Extremely appealing
Provides access to blockchain vendors and partners	15%	4%		29%		52%
Develops solutions for private and public blockchain solutions	13%	2%		31%		53%

q0030gv: Imagine a hypothetical blockchain technology was brought to market that included the following features. To what extent, if at all, do you find these features appealing?	Don't know or not sure	Not appealing at all	Not very appealing	Somewhat appealing	Very appealing	Extremely appealing
Enterprise-grade technology	8%	2%	4%	17%	35%	34%
The Linux Foundation's umbrella blockchain technology	8%	2%	3%	24%	31%	32%
Open governance model	8%	3%	5%	23%	33%	28%
Open development model	8%	2%	3%	21%	31%	35%
The home of interoperability	11%	4%	2%	21%	30%	32%
Long track record of success	8%	3%	4%	21%	30%	34%
Develops solutions for private and public blockchain solutions	7%	2%	4%	21%	29%	37%
Provides access to blockchain vendors and partners	7%	3%	2%	17%	39%	32%
Building better together	7%	2%	4%	15%	35%	36%

q0033gv: Please indicate the extent to which you agree or disagree with the following statements.	Don't know or not sure	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
There is little differentiation across different blockchain technologies today	8%	8%	14%	18%	31%	21%
Blockchain will become a core technology of the future	6%	3%	2%	11%	30%	47%
Blockchain will enable new business models to emerge	5%	2%	2%	11%	40%	41%
There is confusion between enterprise-grade blockchains and cryptocurrencies	5%	5%	6%	18%	35%	32%
Blockchain technology is bad for the environment	6%	18%	15%	18%	23%	20%
I'd rather contribute to / implement a platform with tokens	8%	6%	9%	27%	28%	22%
Enterprise-grade blockchains are just as secure as permissionless blockchains	11%	4%	7%	25%	32%	21%

Hyperledger
F O U N D A T I O N

Hyperledger Foundation was founded in 2015 to bring transparency and efficiency to the enterprise market by fostering a thriving ecosystem around open source blockchain software technologies. As a project of the Linux Foundation, Hyperledger Foundation coordinates a community of member and non member organizations, individual contributors and software developers building enterprise-grade platforms, libraries, tools and solutions for multi-party systems using blockchain, distributed ledger, and related technologies. Organizations join Hyperledger Foundation to demonstrate technical leadership, collaborate and network with others, and raise awareness around their efforts in the enterprise blockchain community. Members include industry-leading organizations in finance, banking, healthcare, supply chains, manufacturing, technology and beyond. All Hyperledger code is built publicly and available under the Apache license. To learn more, visit: **www.hyperledger.org.**

𝕏 **twitter.com/linuxfoundation**

f **facebook.com/TheLinuxFoundation**

in **linkedin.com/company/the-linux-foundation**

▶ **youtube.com/user/TheLinuxFoundation**

○ **github.com/LF-Engineering**

To reference this work, please cite as follows: Anna Hermansen, "Hyperledger Foundation 2023 Brand Study: How Benefits and Challenges Create Opportunities for the Enterprise Blockchain Brand," foreword by David Treat, The Linux Foundation, October 2023.

THE LINUX FOUNDATION | Research

Founded in 2021, **Linux Foundation Research** explores the growing scale of open source collaboration, providing insight into emerging technology trends, best practices, and the global impact of open source projects. Through leveraging project databases and networks, and a commitment to best practices in quantitative and qualitative methodologies, Linux Foundation Research is creating the go-to library for open source insights for the benefit of organizations the world over.