Decline of the Open-Source Software Model

Mirza Saad Beg[1], Vaibhav Shankar Mishra[2], Mr. Amit Srivastava[3]

[1] Student, National Post Graduate College, Lucknow, Uttar Pradesh.

[2] Student, National Post Graduate College, Lucknow, Uttar Pradesh.

[3] Assistant Professor, National Post Graduate College. Lucknow, Uttar Pradesh.

Abstract

Open-source software (OSS) design approach remains famous for its commitment to generating innovation while promoting software development collaboration alongside ease of access. Indicators revealing OSS deterioration represent critical issues regarding its long-term existence and sustainability. The paper evaluates the OSS model's deterioration through examination of major project commercialization alongside funding obstacles and fiercer platform competition from proprietary solutions. The limitations of resources coupled with accountability issues and problems with security and trust have intensified the difficulties confronting OSS projects. The research investigates OSS projects which either became proprietary or failed to start or which successfully evolved into the open-source model exemplified by Linux's enduring resilience despite obstacles. The study evaluates the effects on developers and their peers alongside industry professionals who are facing decreased innovation strength and growing dependency on proprietary tools while often becoming trapped with vendor relationships. This paper suggests revitalization strategies for Open-Source Software by exploring novel funding approaches and building corporate-community alliances together with using blockchain technology advancements. Almost two decades after we took a long and difficult look at OSS developments this investigation stresses the necessity of maintaining this ecosystem and presents strategic directions to keep it relevant for future digital advancements.

I.   INTRODUCTION

The Open-source software approaches are fundamental to software sector innovation because they enable collaborative projects which make technology accessible to everyone. OSS motivates collaboration through shared ownership principles and community-made transparency to produce groundbreaking technologies that encompass Linux operating system alongside Apache web servers and Python language. The projects allow developers to transform industries by giving them access to open platforms which let them build solutions emphasizing both freedom and flexibility. Despite achieving many victories, the OSS model confronts multiple obstacles which block its advancement in today's evolving software environment. Open-source development's foundational principles face disruption from three main factors: the growth of proprietary Software-as-a-Service (SaaS) platforms and the commercialization of major OSS projects and increased corporate funding needs. Projects backed by open-source development face future risks because of contributor fatigue coupled with insufficient financial support and growing security concerns. These sustainability problems put pressure on the continuance of OSS environments. The research focuses on understanding the reasons for OSS model deterioration to evaluate its consequences across developer and industry and user perspectives and create revival approaches. The paper investigates funding solutions and scalability methods alongside adoption barriers to create practical guidelines which strengthen the lasting importance of open-source software in contemporary digital environments.

II.   CAUSES OF DECLINE

Commercialization of OSS

The commercialization of open-source software has

significantly shifted the landscape of the OSS model. Many projects, once entirely community-driven, have transitioned into proprietary or hybrid models as companies seek to monetize their efforts. Examples like Elasticsearch and Redis highlight how commercial interests often lead to restrictive licensing changes, moving away from the original open-source principles. While this provides financial stability to projects, it creates conflicts between profit motives and the OSS community's ethos, leading to a reduced trust in the model. [1]

Funding and Sustainability Issues
A persistent lack of financial support poses one of the most critical challenges to the sustainability of OSS. Many projects rely heavily on unpaid contributors who often face burnout due to the overwhelming demand for maintenance and updates. Inadequate funding mechanisms make it difficult for developers to sustain long-term commitments, leaving many projects abandoned or under-maintained, which undermines their reliability and adoption. [2]

Competitive Pressures
The rise of Software-as-a-Service (SaaS) and proprietary platforms has intensified competition for OSS. SaaS solutions offer convenience, scalability, and user-friendly interfaces, which often overshadow OSS alternatives. The dominance of cloud giants like AWS, which monetize OSS without contributing back to the community, further exacerbates these pressures, reducing OSS adoption and developer participation. [3]

Security and Trust Issues
Open-source projects often struggle with vulnerabilities due to limited resources for rigorous maintenance and updates. Security flaws, such as those found in critical software like OpenSSL, can undermine trust in OSS. Additionally, the lack of accountability for malicious contributions or improper use of open-source tools highlights the need for stronger governance. These challenges pose significant risks, further discouraging widespread adoption. [4]

III.   CASE STUDIES

Docker's Evolving Subscription Model (2023–2024)
Docker introduced major subscribers' model transformations across its system during 2023 that influenced its customer base. Free tier users evaluated their dependency on Docker services as the company implemented usage quota features which restricted Docker Hub image retrieval and storage abilities. The update for Docker Desktop introduced paid subscriptions as users needed paid subscriptions to retain continued access to its features. Users were pushed toward upgrading to paid plans through the policy change that decreased the time inactive images stay on Docker Hub. Team subscription pricing adjustments heightened the costs linked to collaborative projects across teams. Image pull authentication requirements that Docker implemented restricted unauthenticated usage and mandated user account registration for increased usage capabilities. The sequence of changes created a necessary dialogue between developers about how company revenue goals opposed essential open-source principles. [5]

MongoDB's Licensing and Service Model Adjustments (2022–2024)
Within 2022 through 2024 MongoDB increased Server-Side Public License enforcement to prevent unauthorized cloud service deployments of its software. The dispute escalated existing tension with major cloud providers because MongoDB wanted to verify its licensing conditions were fulfilled. The Atlas free tier experienced update changes which included stricter usage thresholds alongside incentives for users to move toward paid plans that deliver improved capabilities and support. The company made enterprise instrumentations more transparent by separating maximum capabilities into premium subscription tiers. Through these strategic moves MongoDB demonstrated how they plan to achieve community engagement alongside fiscal

stability while managing their partnerships with cloud companies. [6]

CockroachDB's Licensing and Service Model Adjustments (2022–2023)

The Business Source License (BSL) from Cockroach Labs underwent changes in 2022 which specified new conditions for using its CockroachDB software platform. The updates to the Business Source License (BSL) from Cockroach Labs restricted service-based CockroachDB distribution unless users agreed to commercial terms for cloud deployment protection purposes. The company applied additional restrictions by implementing feature limitations that reserved select advanced functions exclusively for its proprietary cloud service. Properties within the Enterprise class received reclassification which moved key capabilities into paid levels compelling customers to choose subscription plans for maximum system capabilities. The strategic decisions showed Cockroach Labs' ongoing attempt to safeguard open source principles while establishing commercial viability to support its development projects. [7]

Jenkins/CloudBees' Product and Policy Revisions (2023)

The organization behind Jenkins called CloudBees implemented a market-based restructuring of its enterprise offerings during 2023. The plugin ecosystem received substantial changes through the restructuring as some plugins limited their accessibility exclusively to enterprise subscribers to push customers toward paid plans to access full features. Cloud-based features required organizations to assess premium tier benefits because premium capabilities were restricted only to those who subscribed. The organization reworked its support policies by implementing various support level tiers that related to subscription status and this approach directly impacted user choices about purchasing enterprise solutions. CloudBees achieved its service monetization goals through these new features while remaining committed to supporting open-source Jenkins activities. [8]

GitLab's Free Tier Adjustments (2022–2023)

GitLab made substantial adjustments to its free tier functions during the period from 2022 through 2023. Some tools unavailable previously under free tier plans transitioned into paid plan exclusives which resulted in an adverse impact to developers using these tools for their workflow processes. The company adjusted the way it credits CI/CD minutes to free users reducing their allocation while offering shorter plans at new pricing to encourage extensive usage. Free tier users faced storage limitations that nudged them toward plan improvements for handling bigger projects. The security product lineup changed when sophisticated security capabilities became exclusive to higher-priced plans while prompting organizations to buy premium subscriptions for superior defense mechanisms. The strategic changes demonstrate how GitLab manages cost-free access in conjunction with long-term monetary needs for business survival. [9]

IV. IMPLICATIONS

The decline of the open-source software (OSS) model has far-reaching consequences for developers, the software industry, and end-users. These implications are felt across various aspects, from the career development of individual contributors to the broader landscape of technology and software ecosystems.

Declining Incentives and Career Challenges

As the OSS ecosystem faces funding challenges and increasing commercialization, many developers are finding it harder to sustain their contributions. The lack of consistent financial support can lead to contributor burnout, as many OSS projects rely on volunteer efforts, and developers often have to balance this work with their paid employment. The shift to hybrid or proprietary licensing models further complicates matters, as developers may be forced to choose between adhering to open-source principles or engaging in commercial ventures that offer more lucrative opportunities. This decline in incentives has the potential to discourage new developers from

15

joining OSS communities, affecting the overall growth and innovation of the ecosystem. Furthermore, as more OSS projects become monetized, developers who once had the freedom to contribute openly may face restrictions on how they can participate or contribute to such projects, potentially stifling creativity and innovation. This shift creates challenges for developers trying to maintain open-source ideals while navigating a rapidly changing job market and professional expectations.[10]

Reduced Innovation and Increased Reliance on Proprietary Solutions

The decline of OSS impacts the technology industry's innovation landscape. OSS has historically been a driver of creative solutions and rapid development cycles, thanks to its open nature and collaborative community. However, as OSS projects face financial instability and the commercialization of key projects, innovation in the open-source space may stall. With limited funding and fewer contributors, OSS may lose its competitive edge to proprietary platforms, which have the resources and corporate backing to rapidly evolve and scale. This shift towards proprietary solutions could lead to reduced competition in the software market. As proprietary companies take over areas once dominated by open-source software, industries may become more reliant on these solutions, increasing the risk of vendor lock-in. Furthermore, proprietary solutions are often more expensive and less customizable compared to OSS alternatives, which may limit access to innovative tools for smaller companies or developers. [11]

Risks of Vendor Lock-in and Reduced Software Diversity

End-users, especially those relying on open-source software for flexibility, cost-effectiveness, and transparency, are at risk as the OSS model declines. The transition of OSS projects to proprietary or hybrid models can lead to vendor lock-in, where users become dependent on specific software providers or platforms for ongoing use and updates. Vendor lock-in restricts user freedom by making it difficult to switch to alternatives without incurring significant costs or facing compatibility issues. Moreover, the reduced diversity in software options is another risk for users. OSS has historically provided a wide range of tools, platforms, and applications, enabling users to customize solutions according to their needs. As more software moves behind paywalls or becomes proprietary, users may find themselves with fewer choices, less control over their data, and less opportunity for personalizing their software experience. The loss of OSS diversity could also harm industries that rely on open platforms for innovation, leading to less tailored solutions for niche or underserved markets. [12]

V. STRATEGIES FOR REVITALIZATION

Exploring New Funding Models

To address financial challenges, open-source projects must adopt innovative funding mechanisms. Sponsorship programs, such as GitHub Sponsors, allow individuals and organizations to directly support developers. Crowdfunding platforms and grants from non-profit organizations or government initiatives can also provide financial stability. Additionally, dual licensing models, where commercial users pay for advanced features or support while the core remains open-source, can help sustain projects without compromising the principles of openness. [13]

Strengthening Collaboration Between Corporations and Communities

Corporate involvement has the potential to drive open-source sustainability when aligned with community values. Large organizations can provide financial support, resources, and technical expertise, as demonstrated by Red Hat's contributions to Linux. However, fostering a collaborative relationship requires transparency and ensuring that community-driven priorities remain central. Collaborative

16

governance models, where both corporations and independent developers share decision-making responsibilities, can help maintain a balance between corporate interests and community values. [14]

Leveraging Emerging Technologies
Emerging technologies like blockchain can offer innovative solutions for decentralization and sustainability in open-source software. Blockchain-based platforms can ensure transparent funding and reward systems for contributors through tokenization. Additionally, decentralized platforms can help maintain independence from corporate influence by distributing control among users. These technologies could redefine how contributions are incentivized and governance is managed in open-source ecosystems. [15]

VI. DISCUSSIONS

The open-source software (OSS) model faces decreased popularity alongside industry development changes that make proprietary and open solutions converge. Transformation in the industry occurred during the previous ten years because Software-as-a-Service (SaaS) platforms and cloud-based solutions gained popularity. The design of these models puts supply flexibility together with operational simplicity ahead of conventional OSS development method requirements. The ongoing need for professional support and enterprise-grade features along with requirements to facilitate monetization is pushing many open-source projects toward hybrid or completely proprietary implementations that undermine traditional open-source principles.

As developers with corporations seek realistic solution, they adjust the proportional balance between open and proprietary software models. The open-source core keeps its free status but advanced capabilities and professional support structures operate through monetized operations in hybrid OSS models. The chosen model allows administrators to sustain their budget while preserving OSS inherent

features of accessibility and innovative growth. The combination of open and proprietary models threatens to reduce the primary core elements of trust and openness while preserving open-source ethos.

Open-source development's future depends on its capacity to transform according to changing market dynamics alongside technological developments in the industry. The relevance of OSS in software development depends on solving sustainability challenges along with proactive ecosystem development which preserves both technical advancement and practical execution.

VII. CONCLUSION

The exploration of this paper revealed the primary reasons for OSS model decline stem from commercialization of projects alongside funding challenges and security risks and growing competition from proprietary systems. A pivotal transformation exists in OSS development which now comprises hybrid or proprietary models beyond its original community-based philosophy thus affecting sustainability along with credibility. This research proposes sponsorship programs and dual licensing as innovative funding approaches because they supply financial backing while preserving the essential open-source development fundamentals. Enhanced cooperation between corporations and OSS communities must happen through open partnerships along with shared governance systems. The implementation of blockchain technology brings fresh possibilities for rewarding collaboration while preserving the permanent autonomy of independent OSS development ventures. OSS will thrive into the future based on successful adaptation to rising professional support needs and revenue generation opportunities alongside its pillars of open development and community collaboration. Strategic hybrid models uniting key features from financial sustainability and open-source accessibility need to

17

establish their central role in the OSS future. To thrive in the competitive software realm OSS needs proper solutions for funding requirements together with scalability issues and governance needs.

References

[1] González, A., & Dorronsoro, J. R. (2014). The impact of commercial open-source software on proprietary software producers and social welfare. Journal of Industrial Engineering and Management, 7(4), 1260-1280.

[2] Webiny. (2023). What is commercial open-source software?

[3] A16z. (2024). Open source: From community to commercialization.

[4] OpenLogic. (2023). Are you locked-in with commercial open-source software?

[5] SD Times. (2024, September 12). Docker revamps its subscription plans.

[6] TechTarget. (2024, September 12). MongoDB licensing changes and service model adjustments.

[7] KnowledgeHut. (2022, August 16). Docker License Changes in 2025.

[8] DevsOperative. (2023). Docker Desktop License Changes and Alternatives.

[9] Docker. (2024, December 20). Docker Plans FAQs.

[10] Dagley, R. (2025, January 14). Open-source trends and predictions 2025 from industry insiders. ITPro Today.

[11] Builder.io. (2024, September 3). The unintended consequences of open sourcing software.

[12] HeroDevs. (2024). Navigating end-of-life in open-source software: Challenges and triumphs.

[13] Vinogradov, K. (2024, January 13). Open-source trends for 2025 and beyond. InfoWorld.

[14] TechTarget. (2025, January 23). Review and predictions for open-source software in 2025.

[15] IBM. (2025, January 7). Open-source AI in 2025: Smaller, smarter and more collaborative.