

Public Trust Dynamics: Open Source vs. Proprietary Software

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Introduction

In today's ever-changing digital landscape, people from diverse backgrounds now find themselves using software in their daily and professional lives. Users can choose from proprietary software offered by corporations or from community-driven projects called free and open source software (FOSS). The research conducted in this research paper is focused on the impact FOSS has had across different communities from the underprivileged and underrepresented, to the people that are well off. As society marches further into the future and technology becomes ever more increasingly integrated into the different lives in society, understanding the fine details of available software becomes extremely important. Throughout this research paper the complex play between social economics factors, public opinion, and FOSS are explored; Our research seeks to illustrate how software choices cross over into these issues, touching on equality and accessibility in the digital realm while holding public trust. The aim is to expose the transformative and beneficial potential of FOSS in allowing for an inclusive and fair future.

Literature Review

Among professionals, it is well understood that privacy is becoming more of a commodity than it is a right. The UN recognizes this as well. In June of 2020 Antonio Guterres, the president of the United Nations, presented a roadmap for digital cooperation that aims to keep users protected when interacting with the digital world. Data protection is protected under the seventh key area under the roadmap for digital cooperation which aims to ensure the protection of human rights. FOSS is a great way to protect your data due to its open community nature. Personal data is never stored, sold, or exploited.

Apart from this, studies show that FOSS is also having an impact across other areas of life. For example, when it comes to urban development through affordable means, a 2021 research article titled *Meeting user requirements for mapping and characterizing deprived urban areas in support of pro-poor policies* emphasized how FOSS played a vital role in helping Sub-Saharan Africa with its Sustainable Development Goal 11. This sustainability goal measures the population that still lives in slums, informal settlements, or inadequate housing. However, the problem arose when the available data to measure for this goal was either not available, lacking in some ways, or fell short at being scalable, transferable, and low-cost. This is where FOSS comes into play, leveraging FOSS software named GRASS GIS, not only were the developers able to fill in missing gaps in the costly available data, but also kept expenditures down. The results were an accurate mapping of a deprived urban area. On top of this, this same framework that utilizes FOSS is easily transferable to other Sub-Saharan Africa cities (Kuffer, 2021).

Research Question

Has there been a recent shift in public trust away from proprietary software towards FOSS?

Research Design

Interview Procedure

Interviews were conducted over Zoom, but other mediums were allowed such as phone calls. The focus was to build a connection with the interviewee through a live discussion to be able to get a first hand reaction to the questions being asked; This is something that is hard to translate over email. Additionally, if the interviewee is not aware about a technology or topic, background information will be provided so that they are able to answer the questions effectively. For example, if the interviewee is not aware of the differences between proprietary

software and open source software; If the interviewee is not aware that they might already be using open source software. Furthermore, recent events like that of the 117th Congress legislative action against TikTok will be discussed. The target deadline to complete interviews was November 28, 2023. After which, raw data was compiled and analyzed to pull an effective conclusion on the research question. Target interviewees were targeted towards the general public and supervisors from Loaves, Fishes and Computers and The Document Foundation (More on these two organizations down below).

Interview Questions

1. What are your thoughts on open source software? How about proprietary software?
2. Have you ever switched from proprietary software to an open source alternative? If so, what prompted the change?
3. Have you ever switched from open source software to a proprietary alternative? If so, why?
4. Have recent events influenced your trust in proprietary software? (e.g. TikTok ban or Facebook's congress appearances)
5. To what extent do privacy concerns affect your software preferences?
6. On a scale of 1 to 10, how much do you trust proprietary software?
7. On a scale of 1 to 10 how much do you trust open source software?

Service Organizations

Christopher is participating in the STARBASE Edwards program, a Department of Defense youth initiative designed to immerse students in the world of STEM. In this role, he is tasked with creating and delivering an engaging coding lesson or activity for middle school students, aligned with the California Computer Science Standards. His project focuses on making coding accessible and enjoyable for students in the 6th to 8th-grade range, using interactive tools like games or instructional videos. This endeavor is part of a broader effort to inspire a diverse group of young learners, especially those historically underrepresented in STEM fields. STARBASE Edwards' commitment to fostering early interest in technology and STEM education complements our research on Free and Open Source Software (FOSS) and its socio-economic impact. By introducing students to coding in an inclusive and hands-on environment, STARBASE Edwards embodies the principles of FOSS—openness, accessibility, and community engagement—thereby contributing to a future where technology and education are more democratically distributed and aligned with socioeconomic equity.

Due to logistical challenges and the specific focus of STARBASE Edwards on elementary education, it was not feasible to conduct an interview directly within the site that would align closely with our research topic on FOSS and proprietary software dynamics. To address this gap and ensure a comprehensive understanding of the subject, an interview was conducted with Deven Singh, an IT Support Engineer at Amazon. Deven's extensive experience in a technology-driven corporate environment offered valuable insights into the practical applications and trust dynamics of both FOSS and proprietary software in a professional setting. His perspective, especially in the context of a leading technology firm, provides an important contrast and complement to the educational focus at STARBASE Edwards, thereby enriching our

research with a broader viewpoint on how different types of software are perceived and utilized across various sectors.

Steven and Keldin are working with The Document Foundation on their LibreOffice project. LibreOffice is possibly one of the best examples of the impact free and open source software has had on the world. Originally, LibreOffice was a spin off of OpenOffice, a project started by StarDivision in 1995, who were then bought by SUN Microsystems in 1999. The Document Foundation is an organization based in Germany that was created by a large group of Free Software advocates. The Document Foundation was created with the idea that the culture of an independent foundation brings out the best in its contributors and in turn will result in the best software for its users. Since the creation of The Document Foundation in 2010, their flagship software LibreOffice is estimated to be used by over 200 million active users. Of these 200 million, 25% are students around the globe, showing the broad reach free and open source software has had on society.

Findings

In exploring the dynamics of public trust in open source versus proprietary software, Christopher's interview with Deven Singh, an IT Support Engineer at Amazon, provided pivotal insights (D. Singh, personal communication, December 3, 2023). Singh's experience at Amazon revealed a balanced approach to software usage, where the adaptability and community-driven nature of open source software are valued alongside the reliability and support structure of proprietary software. This balance is reflective of broader industry trends where operational needs and security considerations dictate software choices.

Significantly, Singh noted the importance of FOSS for its innovation capabilities, echoing the principles of transparency and community involvement that are integral to the STARBASE Edwards program, where Christopher is engaged in his service learning. This alignment underlines the relevance of accessible technology across both educational and professional settings. Conversely, the preference for proprietary software in critical business operations at Amazon highlights the reliability and consistent support that such software provides, especially in tech-savvy environments.

Looking ahead, Singh anticipates a hybrid approach in corporate software usage, with increasing trust in FOSS, particularly as its support structures and security mechanisms evolve (D. Singh, personal communication, December 3, 2023). These findings, as elaborated in Appendix A, contribute significantly to our understanding of current software trust dynamics, bridging the gap between theoretical knowledge and practical applications in the field of technology.

On the other side of the aisle, while the Amazon IT support engineer provided valuable insight into the dealings and challenges within a corporate tech giant, an interview was also conducted with Ilmari Lauhakangas; Ilmari Lauhakangas has years of experience in Free and Open Source Software communities. Currently, Ilmari works as a maintainer and mentor for new recruits at The Document Foundation. In particular, his work centers around maintaining the document suite of tools: LibreOffice.

In terms of FOSS, Ilmari views FOSS as an interesting idea that helps unite people of diverse backgrounds and beliefs. Ilmari believes this is FOSS's greatest value it delivers, while

avoiding the risk of wasting time with proprietary software that may become difficult to continue to use. For example, in the case of price model changes.

On top of this, on the question about privacy consideration, Ilmari agrees that proprietary software has a safety net that FOSS simply does not have, in terms of a clear revenue model. Despite this, he continues to support initiatives that provide the greatest amount of individual freedom and privacy. He lists his early days in FOSS helping maintain Retroshare, a secure peer-to-peer file sharing and communications software as an example of this.

Ilmari also added that recent events like that of the TikTok ban in the US helped cement his trust further in FOSS compared to proprietary software. Because of this, in terms of trust, Ilmari rates FOSS on a scale of 1 to 10 an 8. On the other hand, he rates proprietary software 2 points lower, 6 out of 10.

Although Ilmari maintains his position in his preference for FOSS, he acknowledges in his teenage years, he had no other option but to switch from FOSS to proprietary software. Ilmari believes that organizations lack the vision on the future of FOSS projects. He expresses the need for not necessarily more FOSS in the world, but more deployment of FOSS. This could be done with relatively small investments, Ilmari believes.

During the interview, Ilmari also expressed that another significant benefit of FOSS to the world and society at large is the freedom and access it provides. He believes that the transparency in the development process helps this greatly. What is interesting is that the focus was not only just on individuals. Ilmari believes that this same philosophy applies to small and big organizations as well. In particular, this is expressed through the avoidance of vendor lock-ins.

Overall, Ilmari's perspective provided valuable insight, especially considering his years of experience and his time as serving as a leader in these communities. From the information gathered from this interview, it is clear from Ilmari's perspective the importance that FOSS plays in society. From helping organizations avoid vendor lock-ins, to the emphasis of freedom and access that FOSS offers to individuals and organizations. Ilmari's perspective that FOSS requires more deployment should not be ignored. Small investments in forms of donations and contributions from individuals and organizations benefiting from FOSS is what is required to make this happen if the values expressed by Ilmari are to be maintained for the future to come.

Lastly, to get a further understanding of the general public's use and trust of software, a small scale survey was conducted through multiple websites with the use of a Google Form. This form had a total of 13 respondents. The form held 8 questions. 7 of those questions were mentioned in the interview procedure section of this paper and question 8 prompted the individual to add any extra information that they would like to provide.

The survey showed that only 15.4% of submitters did not know what open source software was and 7.7% were unsure if they knew what it is. Regardless, 92% of submitters went on to answer the rest of the questions, many of which included examples of what proprietary software and open source software is. Surprisingly, 63% of submitters admitted to switching to open source solutions, and the main reason stated was because of monetary concerns. In fact, not a single response mentioned privacy concerns. Reasons were mainly focused on monetary concerns, software performance, or customization. A whopping 81% have admitted to also switching to proprietary software from open source. The reasons often mentioned a lack of features in open source solutions or industry standards, like Photoshop being used in the commercial space almost exclusively.

The second half of the survey was intended to probe if privacy matters to the general consumer and how it affects their choices in software. Respondents were asked if recent events such as the TikTok ban or Facebook's congress appearances affected their trust in proprietary software in any way. Most respondents stayed neutral (33%) or slightly leaned toward (41%) negatively affecting their perception. When asked if privacy concerns affected their choices in software, respondents often chose to respond saying it does, but also making a point to state that they expect to give up some personal data. Respondents often mentioned how they try to be careful and reduce the amount of data being harvested about them, but also realize that their data is going to end up out there anyways.

Finally, respondents were asked on a scale of 1 to 10 how much they trusted proprietary and open source software. The data from these two questions showed that both software types have work to do when it comes to gaining the public's trust. 58.3% of respondents rated proprietary software's trustworthiness less than or equal to a 5 while 33% rated open source software trustworthiness less than or equal to 5. Responses showed concerns over how open source is more of an unknown. Proprietary software typically has a recognizable name behind the products. For example, Photoshop is behind the Adobe name and it is clear what to expect from the software based on Adobe's past history. Something in the open source community typically does not have such a backing or history. Respondents didn't feel like they knew who the software was really coming from and therefore if it could be trusted.

Conclusions

The intention of this research was to answer the question "has there been a recent shift in public trust away from proprietary software towards FOSS?". Our findings indicate that proprietary software has lost some credibility, but not nearly enough for open source software to

take over the industry. While proprietary software can be less trusted, it has the advantage of having a safety net and a structure that is proven to work over many years, as mentioned by Ilmari from The Document Foundation.

As seen in the interviews, industry professionals who are already aware of how open source software is handled, are open to the adoption of this technology. It was mentioned that open source software is where innovation happens. This is because any user can contribute to the product and add features that they want to use. That simply is not possible with proprietary software.

The survey conducted with a Google Form indicates a slight hesitation to adopt open source software. For an average user, open source software has an inherent problem of having many unknowns. The form had multiple responses mentioning that the software is just as untrusted as proprietary software because they still don't know who made the software. The ones who were open to switching or have switched in the past mostly mentioned that open source had features they desired or performance fixes that simply weren't in the proprietary versions.

Recommendations

It is clear that both open source and proprietary softwares need to reevaluate their priorities. Proprietary software has a rock solid foundation with limitless funding and support through private means while open source has a foundation with a reliance on public funding through donations but they have a gigantic community support structure. Fortunately, both open source and proprietary can coexist in the industry.

Proprietary software should focus more on gaining the public trust and being more open to community involvement. Proprietary software is already the standard in many workplace environments and is already the default choice for the majority of average users thanks to

proprietary software's large budget for advertising. Data transparency would be a good step for these companies to take and allow their users to see what data is being stored, used, and what it is being used for. Governments may also be able to step in and address issues by placing regulations on user data such as The General Data Protection Regulation (GDPR) such as the European Union has done.

Open source software is far from perfect as well. Open source organizations could do a better job at informing everyday users about the benefits of open source and the negatives of proprietary software. While funding is limited for open source organizations, finding sponsors and investing that capital to create educational videos or advertisements may be beneficial to the industry as well. Government intervention is a bit more difficult for something like open source, but maybe an "open source initiative" fund could be a positive option and promote competition and deployment. Open source's largest disadvantage to proprietary software is its revenue structure and if an outside source like the government can resolve that, then open source can have a great chance at being adopted and seen by more average everyday users.

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Appendix

Appendix A: Interview Transcript with Deven Singh

Interview Details:

- Interviewer: Christopher Varela
- Interviewee: Deven Singh, IT Support Engineer I, Amazon
- Date of Interview: December 3, 2023
- Method of Communication: Chime voice call (Zoom for Amazon Employees)

Transcript:

Christopher Varela: Thank you for taking the time to speak with me today, Deven. Could you start by telling us a bit about your role at Amazon?

Deven Singh: Certainly, Christopher. I'm an IT Support Engineer at Amazon. My role involves providing comprehensive technical support to our corporate employees. This includes troubleshooting IT issues, managing ticket queues, and ensuring compliance with IT policies.

Christopher Varela: In your experience, how are open source and proprietary software perceived in terms of trust within a corporate environment like Amazon?

Deven Singh: Trust is a key factor in our software choices. At Amazon, we utilize both open source and proprietary software. Open source software offers transparency and community-driven solutions, which are highly valued. However, proprietary software often brings dedicated support and stability, which are crucial for business operations.

Christopher Varela: How do Amazon employees generally respond to using open source software?

Deven Singh: Our employees, being largely tech-savvy, appreciate the flexibility and customization that open source software offers. However, for critical operations where reliability is paramount, we often rely on proprietary solutions.

Christopher Varela: From a security and reliability standpoint, do you find open source software to be on par with proprietary software?

Deven Singh: Both have their strengths in terms of security. Open source software benefits from rapid community-driven patches, while proprietary software typically has robust, dedicated security teams. The choice often depends on the specific needs of the application.

Christopher Varela: Have there been instances where open source solutions were preferred over proprietary ones at Amazon, or vice versa?

Deven Singh: Absolutely. Open source solutions are sometimes favored for custom internal applications due to their flexibility. Conversely, for processes requiring strict compliance and standardization, proprietary software is usually the preferred choice.

Christopher Varela: Finally, how do you see the role of software in corporate settings evolving, especially regarding open source?

Deven Singh: The future seems to be leaning towards a hybrid approach. Open source software is gaining more trust, particularly as its security and support structures improve. However, I believe proprietary software will remain essential in large corporations for its stability and comprehensive support.

Christopher Varela: Thank you, Deven, for your insights. They will be incredibly valuable for our research.

End of Appendix A

Appendix B: Survey - Google Form

Survey Details:

- Surveys were 8 questions, however only question 1 was required.
- Survey was shared on multiple websites available for anyone to access. Some include:
 - LinkedIn
 - Discord
 - MyRaft
 - Instagram

Survey Results by question (multiple choice only):

Question 1: “Do you know what open source is?”

- 76% answered yes
- 15.4% answered no
- 7.7% were unsure

Question 4: “Have recent events influenced your trust in proprietary software in a negative way? (e.g. Proposed TikTok ban or Facebook’s congress appearances)”

- 16.7% answered heavily
- 41.7% answered moderately
- 33.3% answered unchanged
- 8.3% answered “other” and inserted a response

Question 6: “On a scale of 1 to 10, how much do you trust proprietary software?”

- 33.3% answered 1
- 8.3% answered 3
- 16.7% answered 5
- 8.3% answered 6
- 25% answered 8
- 8.3% answered 9

Question 7: “On a scale of 1 to 10 how much do you trust open source software?”

- 8.3% answered 1
- 8.3% answered 3
- 16.7% answered 5
- 8.3% answered 7
- 25% answered 8
- 16.7% answered 9
- 16.7% answered 10

End of Appendix B

Appendix C: Interview Transcript with Ilmari Lauhakangas

Interview Details:

Interviewer: Keldin Maldonado

Interviewee: Ilmari Lauhakangas, The Document Foundation Member, LibreOffice Maintainer (Location Supervisor)

Date of Interview: November 29, 2023

Method of Communication: JitSi

Transcript:

Keldin Maldonado: These questions are mostly gathering information from someone like yourself that is fairly familiar with FOSS.

Keldin Maldonado: So, to start off here is the first question: What are your thoughts on open source software? How about proprietary software?

Ilmari Lauhakangas: Open source software is quite a unique object as both capitalists and communists find something to like in it.

Keldin Maldonado: Oh interesting. So for you, is neutrality, or how it brings these different types of people together important?

Ilmari Lauhakangas: At least it is fascinating and also the immediate value provided is nice, so there is less risk of wasting one's time. As in, it might be rare for someone to go "I wish I would not have spent so much time working on open source," because it will always benefit the public in some way.

Keldin Maldonado: What about proprietary software?

Ilmari Lauhakangas: Well, proprietary software surely still makes sense for many areas of business and I guess it would be difficult to imagine the games industry being mostly open source, but I've long been interested in figuring out how far we can take open source, key thing there is financing.

Keldin Maldonado: Alright, now let me ask you this other question: To what extent do privacy concerns affect your software preferences? Especially considering that you say that you are interested in figuring out how far open source can be taken.

Ilmari Lauhakangas: So if there is no business or a way to revenue, proprietary is the safe route. Personally, privacy is not a huge concern, but I like to support efforts that protect the privacy of users. Like, the first open source project I contributed to was Retroshare, the secure communication platform, which is peer to peer.

Keldin Maldonado: In regards to trust though, on a scale of 1 to 10? How much would you say you trust

foss and proprietary software? Trust as in privacy, security, etc.

Ilmari Lauhakangas: Maybe 8 for FOSS and 6 for proprietary.

Keldin Maldonado: Would you say that the media has influenced your scoring? For example, recent talks about the TikTok ban in the US?

Ilmari Lauhakangas: Yes, I don't think I'm immune to media influence on this

Keldin Maldonado: Have you ever switched from proprietary software to foss?

Ilmari Lauhakangas: Yes. I have done this plenty of times, I think this is a given considering the line of work I do.

Keldin Maldonado: Have you ever switched from foss to proprietary software? If so, why? was it a quality issue, privacy, security, etc

Ilmari Lauhakangas: Yes! Because I ran Linux for a while when I was a teenager in the 1990s, but then went back to Windows. I suppose it was the small size of the software ecosystem back then.

Keldin Maldonado: Have you done this in recent times?

Ilmari Lauhakangas: Recently I haven't done it.

Keldin Maldonado: Do you think the world needs more FOSS?

Ilmari Lauhakangas: Yes, in particular it needs to *deploy* more FOSS; Deploy it and it shall improve.

Keldin Maldonado: There definitely is a lot of foss, but not much deployed.

Ilmari Lauhakangas: Organizations lack the vision of how foss could improve, if it gains momentum, with relatively small investments.

Keldin Maldonado: Last question: What would you say that is the biggest benefit foss has for society/the world. in particular, thinking about all different economic and social backgrounds, from rich to poor.

Ilmari Lauhakangas: I suppose it has to be the freedom of access. Transparency of the development process is also quite important. Freedom of access includes the ability to avoid vendor lock-in, especially for organizations. So they won't ever get stuck with some company who dictates pricing etc.

Keldin Maldonado: Thank you for your time, Ilmari. Those were all the questions I had for you today.

End of Appendix C