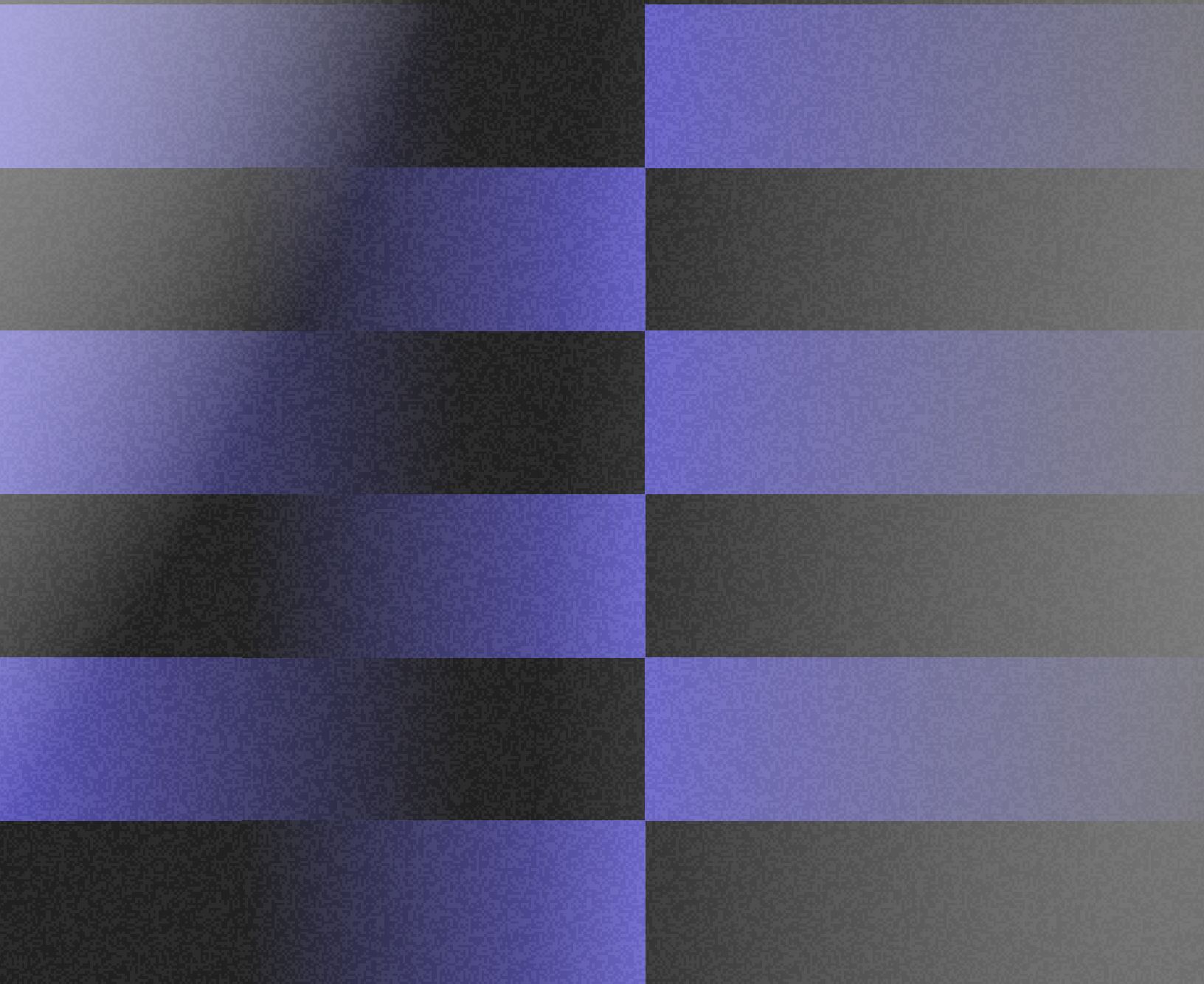# The Rise of Open-Source Self-Hosted Solutions

Navigating the shift towards
greater control and customization
in business applications

Are you struggling to maintain control over your business's critical data and applications? Companies are increasingly seeking greater autonomy, security, and customization in their software infrastructure. This growing trend has led to a significant shift towards open-source self-hosted solutions. According to the 2023 State of Open Source Report by OpenLogic and the Open Source Initiative, 80% of surveyed companies reported increased use of open-source software over the previous year.

Gartner also predicts that by 2025, 60% of enterprises will adopt privacy-enhancing computation technologies to protect data in use, up from less than 5% in 2021. Self-hosting is one of these core data protection approaches. We'll explore what's driving this change and how your business can benefit from self-hosting its critical applications.

Before embarking on the self-hosting journey, it's crucial to consider several key factors. These include the level of control and customization needed, data security requirements, and available IT resources for maintenance and updates. While self-hosting can often be more cost-effective over time compared to SaaS solutions, it's essential to ask the right questions before taking this path.

To gain deeper insights into this trend, we interviewed over 100 developers across various industries. Our goal was to uncover the motivations driving this shift, the benefits and challenges of self-hosting and open source, and the role of emerging technologies such as AI and low-code platforms in shaping this landscape. Through this process, we've discovered how self-hosting and open source are empowering businesses to take control of their digital ecosystem.

This ebook is designed to guide you through the world of self-hosting, whether you're an IT leader, software architect, or developer. It's divided into sections covering the importance, benefits, and challenges of self-hosting. Then, we'll provide practical guidance on how Appsmith can serve as a suitable solution for your next self-hosted business application.

appsmith_

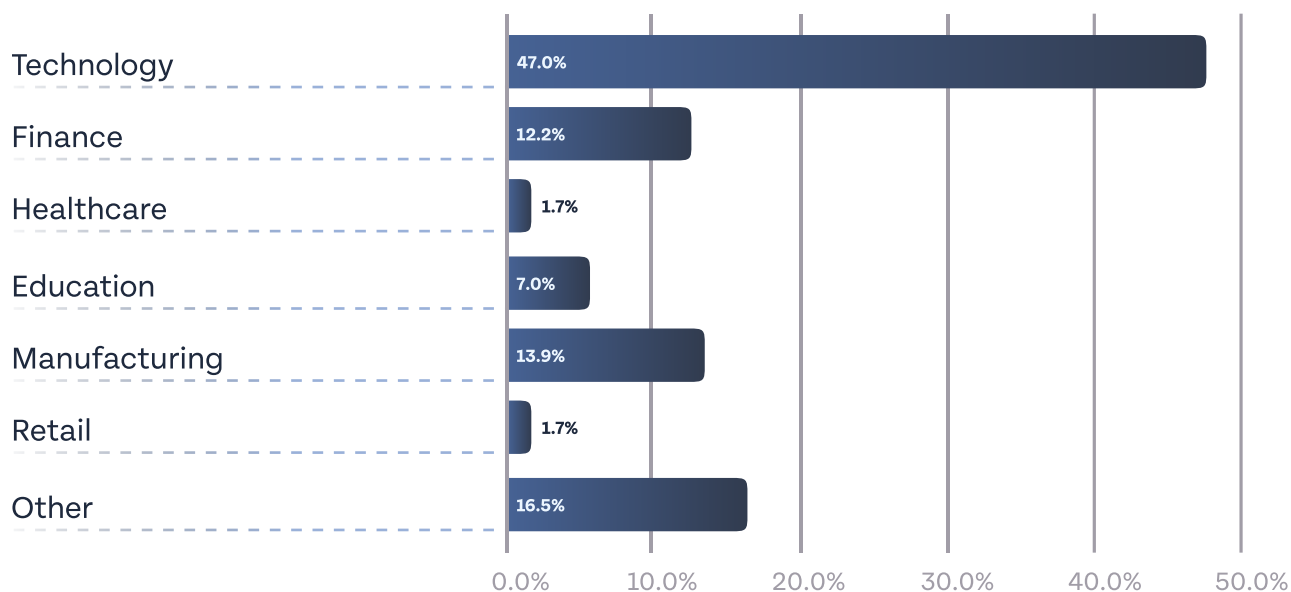# TABLE OF CONTENTS

Survey demographics

The survey respondents come from a broad range of industries including technology, education, manufacturing, and finance. The majority of respondents hold roles such as engineers, DevOps, managers, and senior-level positions. The length of time respondents have been in their current roles varies, with over half having more than four years of tenure.

What industry are you in?

Industry	Percentage
Technology	47.0%
Finance	12.2%
Healthcare	1.7%
Education	7.0%
Manufacturing	13.9%
Retail	1.7%
Other	16.5%

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How long have you been in your current role?

More than 6 years	**23.5%**
	10.4% Less than 1 year
4-6 years	**31.3%**
	34.8% 1-3 years
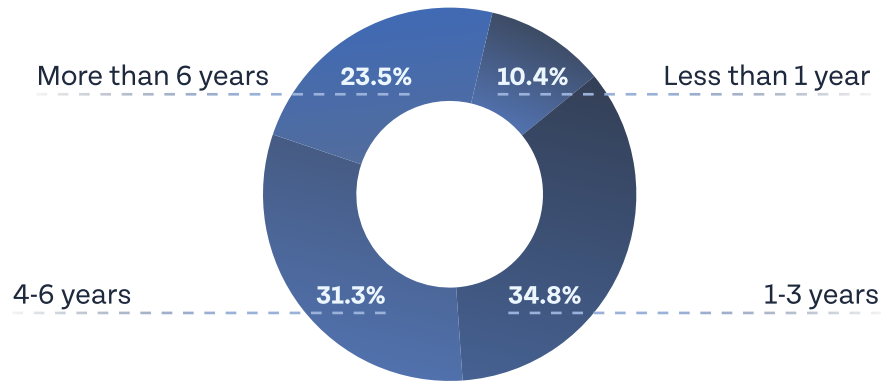
Current adoption of self-hosting

One of the key findings from the survey reveals a strong preference for self-hosting applications on-premises, on private servers, or through managed hosting services. Over 75% of respondents indicated that their organizations choose to self-host web applications, databases, and internal tools.

While this trend is most pronounced in the technology sector, it also extends significantly to other industries such as finance and manufacturing. These industries usually have stringent data protection regulations and may prefer self-hosting to ensure full control over sensitive data. The technology sector usually requires highly specialized software solutions, so they may opt for self-hosting to tailor applications to their specific requirements.

Does your organization currently self-host any software applications that are used by you or your department? Note: Self-hosting refers to the practice of running and managing software applications on your own servers or infrastructure, rather than relying on third-party cloud services (SaaS).

No — 20.9%

79.1% — Yes
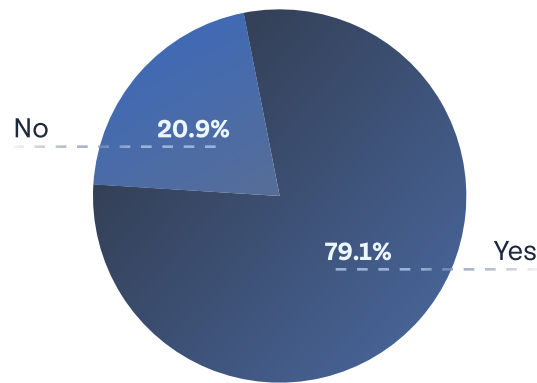
What types of applications does your organization currently self-host? Select all that apply.

Web applications	79.3%
Databases	78.3%
Internal tools	71.7%
Other	4.4%

0.0% 10.0% 20.0% 30.0% 40.0% 50.0% 60.0% 70.0% 80.0%
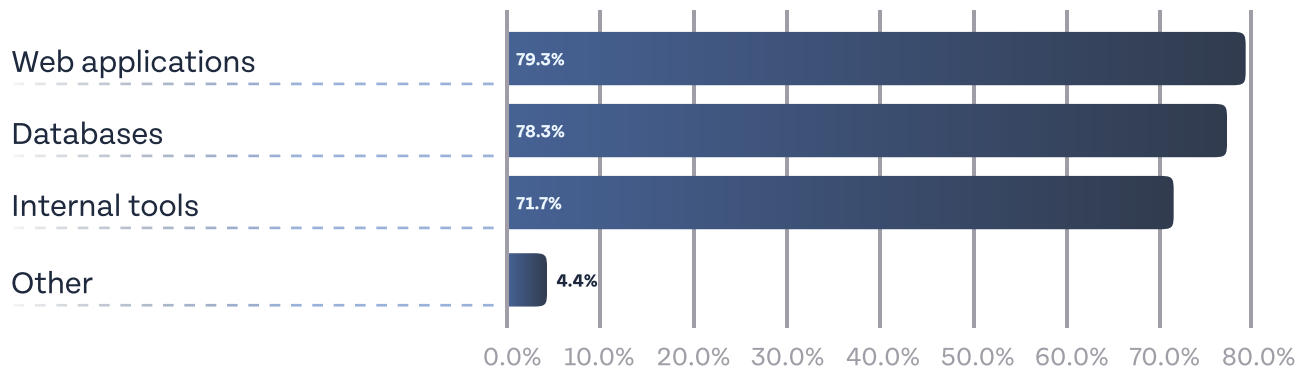
The **motivations** driving the shift to **self-hosting**

The motivation behind the shift to self-hosting is multi-faceted. The primary factors influencing this decision include cost savings, data control, security, customization, and flexibility.

Approximately 70% of respondents cited cost savings as a major motivator, and a similarly-sized group cited data control. Security and customization were also significant factors, each cited by around 57% of respondents.

What factors influenced your organization's decision to choose to self-host your solutions instead of opting for a SaaS provider? Select all that apply.

Factor	Percentage
Cost savings	67.4%
Data control	71.7%
Security	63.0%
Customization	52.2%
Flexibility	43.5%
Other	4.4%
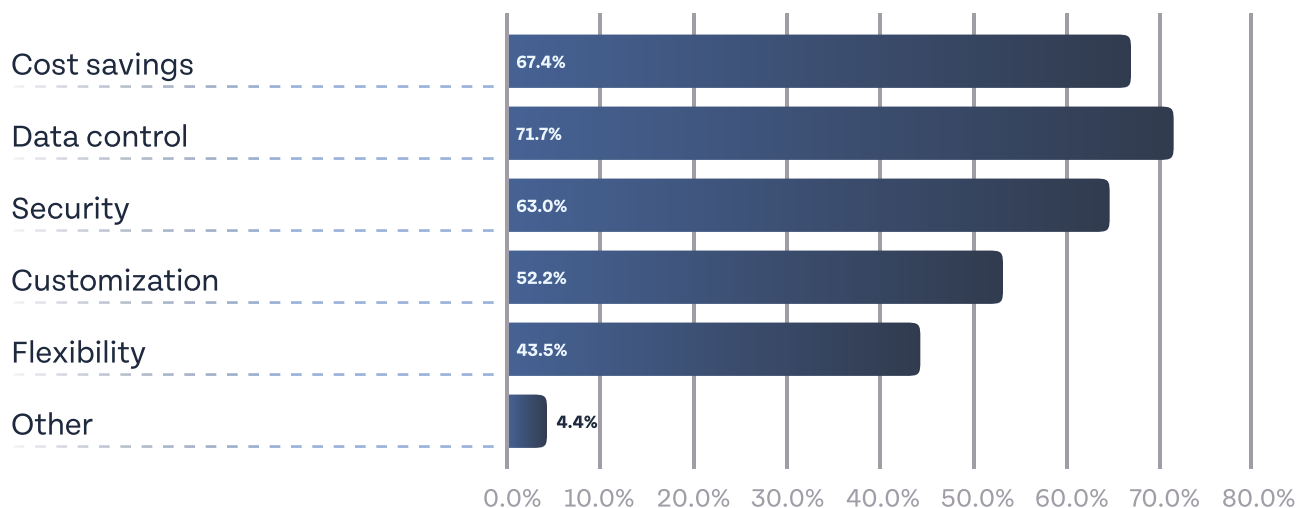
These motivations could reflect a growing concern over the costs and risks associated with third-party cloud services. Organizations are increasingly looking to self-host to mitigate these risks and achieve a more controlled and customizable environment.

One of the main concerns with off-the-shelf solutions is the cost. These solutions often come with high upfront licensing fees, ongoing subscription costs, and additional expenses for customization and support. Over time, these costs can add up, making off-the-shelf solutions less affordable for many organizations. This financial burden can be a significant issue, especially for smaller companies with limited budgets.

> By self-hosting, businesses can tailor their environments to meet specific security and customization needs (e.g., developing workflows unique to their business, integrating custom features unavailable in off-the-shelf solutions), reduce dependency on external providers, and potentially lower long-term expenses.

## Case study: GSK chooses Appsmith for a self-hosted app to patch 3,500 Linux servers in one sprint

GSK, a global biopharma company with over 120,000 employees, chose to self-host Appsmith to build internal tools due to its strong security features and flexibility. Matt, the Director of Automation at GSK, needed a solution that could be deployed behind their firewall and offer complete control over their data.

Using Appsmith, Matt's team built an application to manage the patching process for GSK's fleet of 3,500 Linux machines. This tool drastically reduced the time spent on patching and improved overall efficiency.

Matt's team valued Appsmith's easy installation process, its ability to integrate with existing systems, and the support for custom security measures.
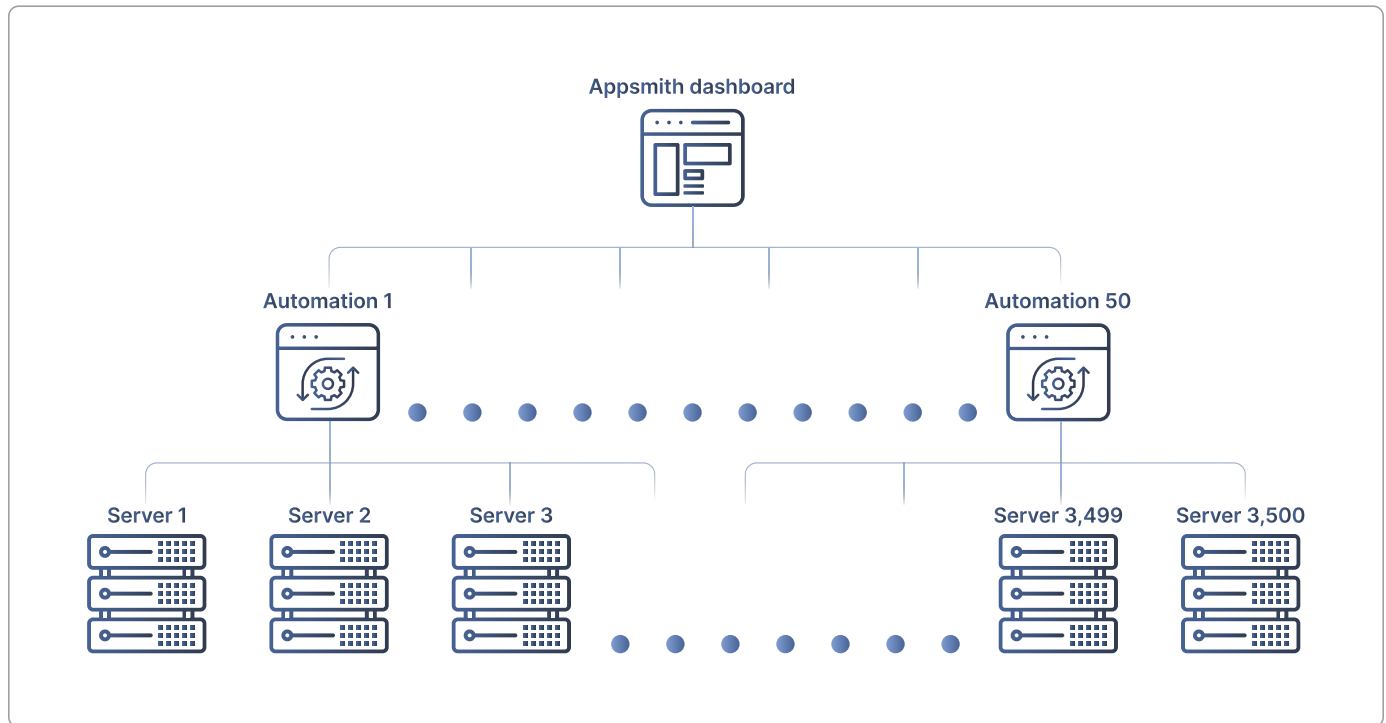
The self-hosted nature of Appsmith allowed GSK to maintain stringent security standards while benefiting from a low-code platform's rapid development capabilities. Self-hosting can provide both the security and control needed by large enterprises, along with the flexibility to create custom internal tools efficiently.

For more details on how GSK leveraged Appsmith's self-hosted solution, read the full case study here.

# How has open-source software (OSS) influenced self-hosting practices?

Open-source software (OSS) refers to software that is released with a license that allows anyone to view, modify, and distribute the source code. Users can adapt the software to their needs, contribute to its development, and share their improvements with the community.

After the Linux Foundation, one of the biggest open-source software foundations, was established in 2000, there has been a significant increase in the adoption of open-source software (OSS). This growing trend has been observed across various industries, reflecting the increasing recognition of the benefits that OSS can provide.

We explored how open source adoption has influenced organizations' decisions regarding self-hosting. Around 80% of our respondents shared that this increased adoption has influenced their decision to self-host their business solutions.
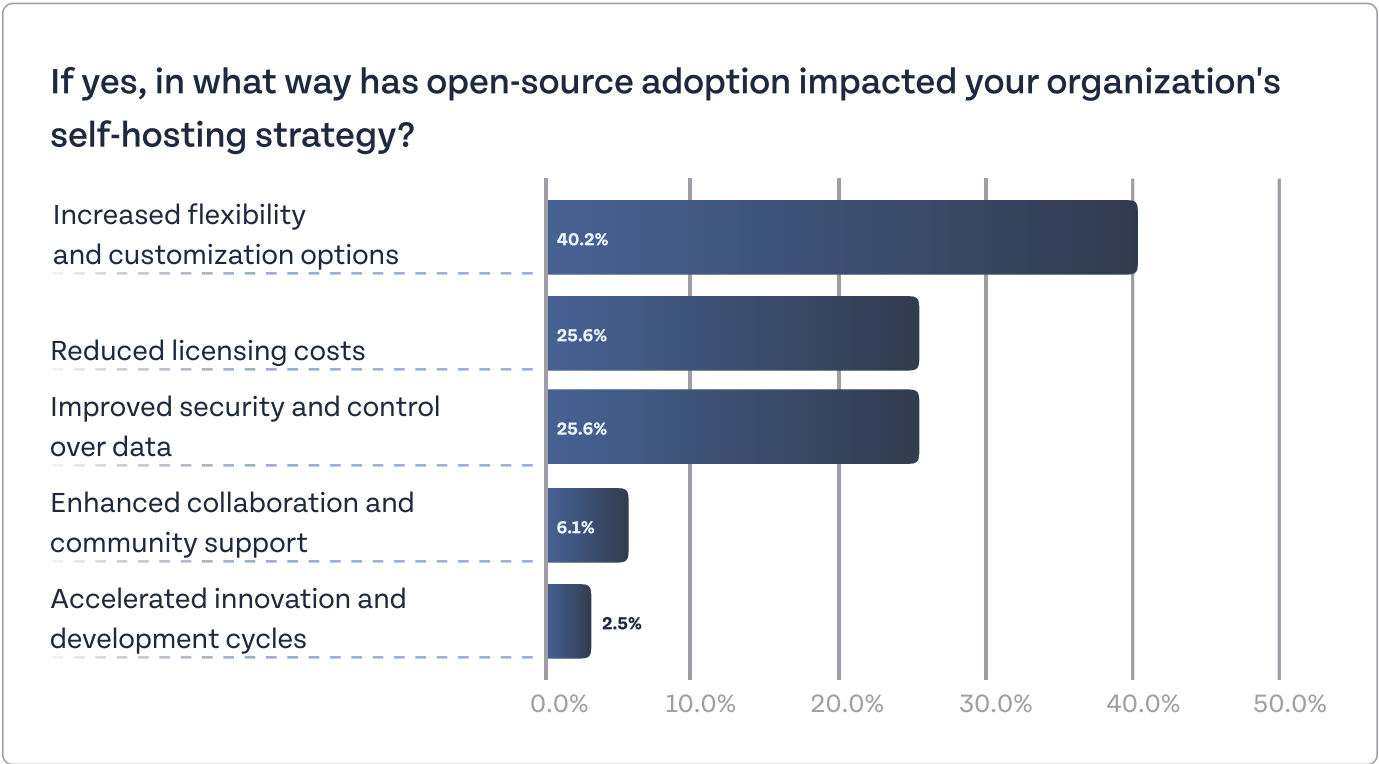
Has the increased adoption of open-source software influenced your organization's decision to move towards self-hosting?

No — 22.5%

77.5% — Yes

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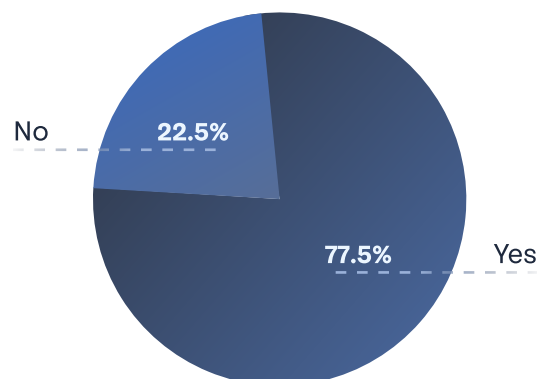
The main two reasons why open-source software influences businesses to self-host are increased flexibility and customization options, and improved security and control over data.

> Open-source software provides flexibility and customization by allowing developers and organizations to modify the source code to meet specific needs and integrate seamlessly with existing systems.

Security and control over data are two aspects that influence self-hosting open-source solutions, since businesses can inspect the code for vulnerabilities, implement their own security measures, and maintain data on their own infrastructure, reducing reliance on third-party providers.

If yes, in what way has open-source adoption impacted your organization's self-hosting strategy?

Category	Percentage
Increased flexibility and customization options	40.2%
Reduced licensing costs	25.6%
Improved security and control over data	25.6%
Enhanced collaboration and community support	6.1%
Accelerated innovation and development cycles	2.5%

Case study: F22 Labs saves $1,200 monthly with a self-hosted project management solution

F22 Labs, a product design and development studio in Chennai, faced escalating costs with their project management software. They found a cost-effective solution by adopting an open-source platform and extending it with custom analytics dashboards built using Appsmith.

With over 60 team members working across multiple projects, F22 Labs needed robust project management software. However, they struggled to find a solution that offered the right balance of features, user experience, and cost-effectiveness.

Murtuza Kutub, Founder and Partner at F22 Labs, explained, "We tried various tools, but faced consistent challenges. They were either too expensive as our team grew, lacked a great user experience, or didn't provide the detailed reporting and dashboards we needed."

F22 Labs chose Plane, an open-source project management platform, for core functionality. To address the lack of advanced cross-project visibility, they turned to Appsmith to build custom analytics dashboards. "Appsmith is simple and straightforward to build with," said Murtuza. "Within a day, we were able to build out the entire dashboard we needed."

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The custom solution developed with Appsmith provided comprehensive visibility across projects, saving project managers 5–10 hours per week. It also improved their sales process by enabling better project pricing based on historical data.

Most importantly, the new setup resulted in substantial cost savings. Murtuza estimates that F22 Labs is saving nearly $1,200 per month in software costs compared to their previous commercial solution.

> "Beyond just the hours and cost savings, Appsmith has really helped us remove a level of friction," Murtuza added. "Everyone has visibility into project progress, creating a sense of responsibility in the team."

Self-hosting and custom development using low-code platforms like Appsmith can provide significant benefits in terms of cost savings, efficiency, and tailored functionality for businesses. For more details on F22's solution built with Plane and Appsmith, read the full case study here.

AI integration is becoming crucial in self-hosting strategies

AI integration is becoming an increasingly important part of self-hosting strategies for many businesses. Our previous study on AI adoption revealed a significant variation in AI tool usage across job levels, with over 30% of executives reporting daily use. This growing interest in AI is fueling a corresponding surge in self-hosting adoption, as companies seek to leverage AI capabilities while mitigating data security risks.

In this survey, about 60% of respondents indicated that AI is a component of their self-hosting strategy. The main benefits of integrating AI into self-hosted applications, as reported by respondents, include:

- Faster programming and development cycles
- Easier integration with existing systems
- Reduction in manual work
- Generation of innovative ideas

Is AI part of your organization's self-hosting strategy?

No **38.5%**   **61.5%** Yes

The Rise of Open-Source Self-Hosted Solutions
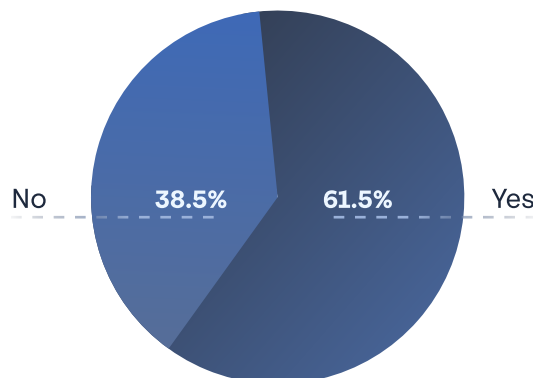
The rise of AI could also be driving a shift towards self-hosting as a means of secure experimentation. Companies are eager to use AI but remain cautious about potential data risks. [McKinsey's State of AI report](#) revealed that 47% of companies are already working with their own AI models, as opposed to relying on public off-the-shelf solutions. This trend underscores a growing preference for self-hosted models that allow organizations to explore AI applications while maintaining control over their sensitive data.

The convergence of AI and self-hosting represents a strategic approach for businesses looking to innovate securely. By leveraging self-hosted AI solutions, companies can experiment with cutting-edge technologies while ensuring data privacy and compliance with regulatory requirements.

Primary benefits and drawbacks of self-hosting

Self-hosting open-source solutions offers cost savings and enhanced security by allowing businesses to implement custom measures and maintain full control over their data. However, it requires ongoing maintenance and vigilant security practices.

The respondents highlighted several key benefits of self-hosting, particularly cost savings. While self-hosting can involve up-front costs, especially for setup and infrastructure, it often proves more economical over time. Off-the-shelf solutions can become costly as licensing fees, subscription costs, and customization charges accumulate. In contrast, self-hosting can offer a more scalable and budget-friendly alternative in the long run.

Security stands out as another major advantage, cited by about 42% of respondents. By self-hosting, organizations can implement their own security measures and maintain full control over their data. This autonomy allows for a tailored approach to security that can be more robust than relying on third-party solutions.

What are the primary benefits your organization has realized with self-hosted solutions?

Benefit	Percentage
Cost savings	30.8%
Control	12.1%
Security	41.7%
Customization	4.4%
Flexibility	9.9%
Other	1.1%
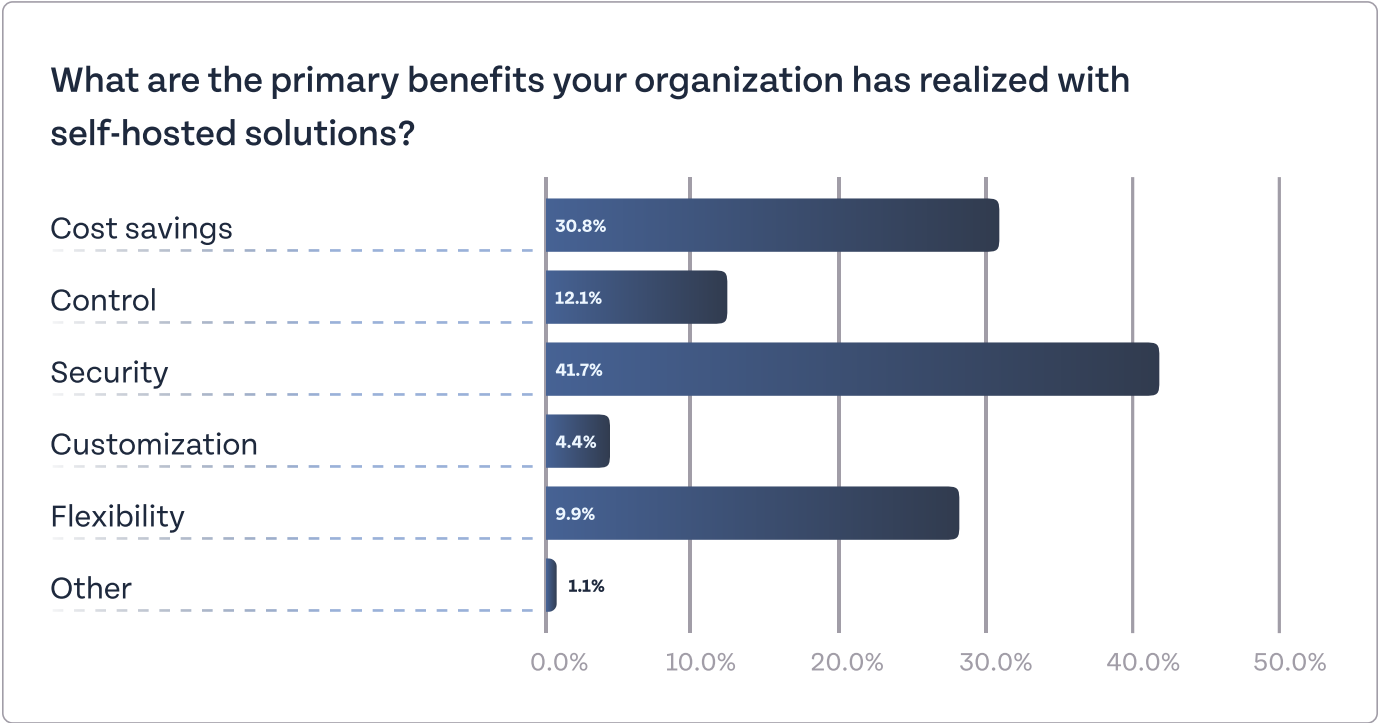
However, self-hosting open-source solutions is not without its challenges. Maintenance is a significant concern shared by almost 38% of respondents, as these solutions require continuous monitoring, updates, and troubleshooting to ensure they remain secure and functional.

Scalability can also be an issue, as organizations must plan and allocate resources effectively to handle growth. Moreover, while security is one of the main benefits, it also presents a challenge: businesses must rigorously configure and continuously monitor their systems to protect against vulnerabilities and threats.

Self-hosting offers substantial benefits in terms of cost savings and security, but these come with added responsibilities. Organizations must be prepared to invest in ongoing maintenance and vigilant security practices to fully gain the rewards of self-hosting.

What challenges or drawbacks has your organization encountered with self-hosted solutions?

Challenge	Percentage
Maintenance	37.8%
Scalability	18.9%
Security concerns	28.9%
Initial setup cost	3.3%
Lack of support	7.8%
Other	3.3%

0.0%   10.0%   20.0%   30.0%   40.0%   50.0%
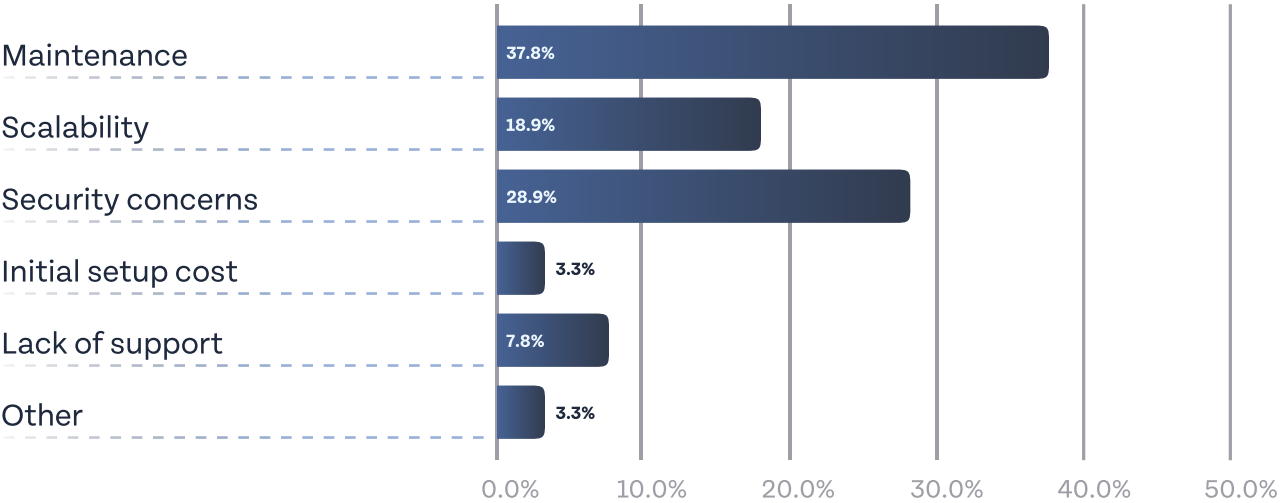
Low-code platforms are gaining popularity for self-hosted application development

Low-code platforms enable developers to build apps quickly and efficiently, without the need for extensive manual coding. These platforms provide visual interfaces and pre-built components that streamline the development process, allowing both professional developers and citizen developers to build fast business critical applications.

Low-code platforms are gaining significant traction as tools for developing self-hosted applications. Around 60% of respondents reported using these

platforms. Of those low-code platform users, integration capabilities with existing systems emerged as the most crucial feature, cited by 51% of respondents. This underscores the importance businesses place on solutions that seamlessly integrate with their current infrastructure.

Close behind in importance was the emphasis on ease of use and intuitive interfaces, indicating a strong preference for accessible and user-friendly platforms. These factors contribute to accelerated development cycles and broader adoption within organizations, making low-code platforms an increasingly attractive option for self-hosted application development.

Does your organization currently use any low-code platforms to develop self-hosted applications?

No   **39.6%**   **60.4%**   Yes
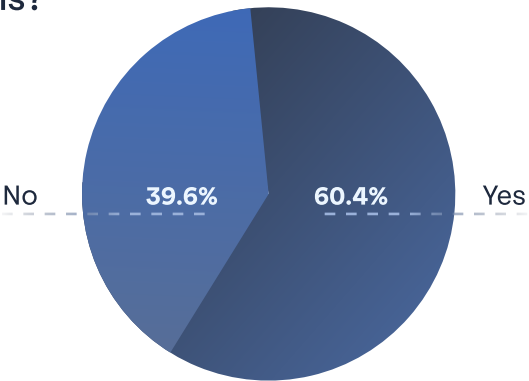
What feature of low-code platforms is most important to your organization?

Ease of use and intuitive interface — 32.7%

Integration capabilities with existing systems — 50.9%

Scalability and performance — 10.9%

Security features and data protection — 5.5%

Other — 0.0%

0.0%   10.0%   20.0%   30.0%   40.0%   50.0%
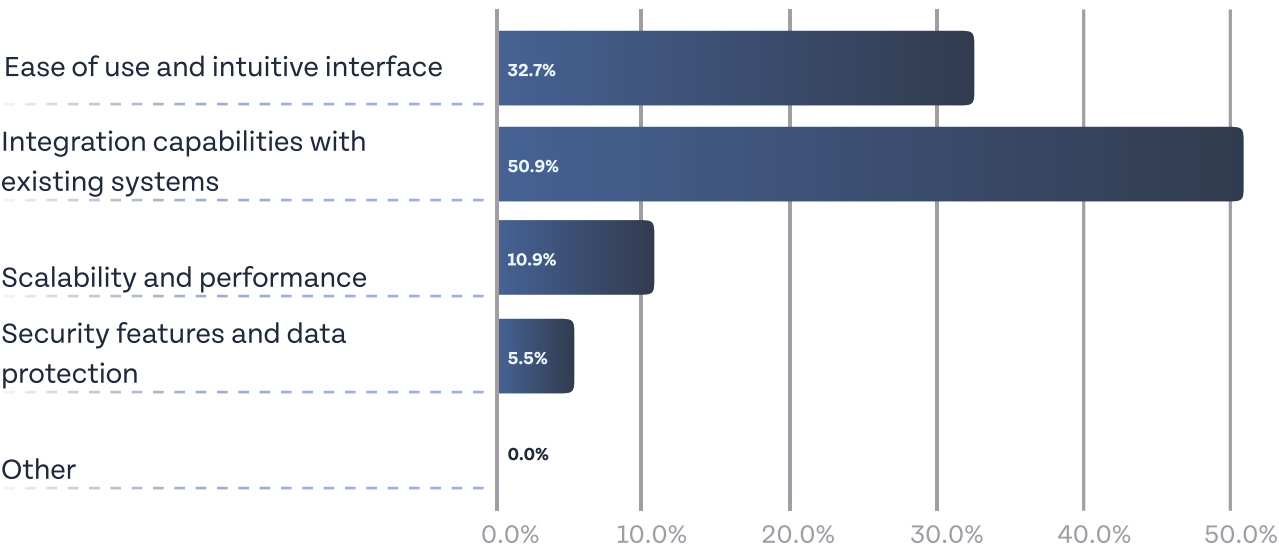
However, respondents shared that the biggest challenges they anticipate facing when self-hosting low-code applications are security, maintenance, and updating. About 28.5% shared that security remains a paramount concern, as self-hosting requires robust measures to protect sensitive data and systems.

The ongoing maintenance of these applications demands considerable time and resources. Since regular updates and patches are essential to ensure optimal performance and address potential vulnerabilities.

Moreover, keeping applications up to date with the latest features and compatibility requirements can be a complex and time-consuming process, especially for organizations with limited IT resources.

What challenges do you anticipate when self-hosting low-code applications?

Challenge	Percentage
Maintenance and updates	23.1%
Scalability	23.1%
Security concerns	28.5%
Initial setup cost	8.8%
Lack of support	5.5%
Integration with existing systems	5.5%
Other	5.5%
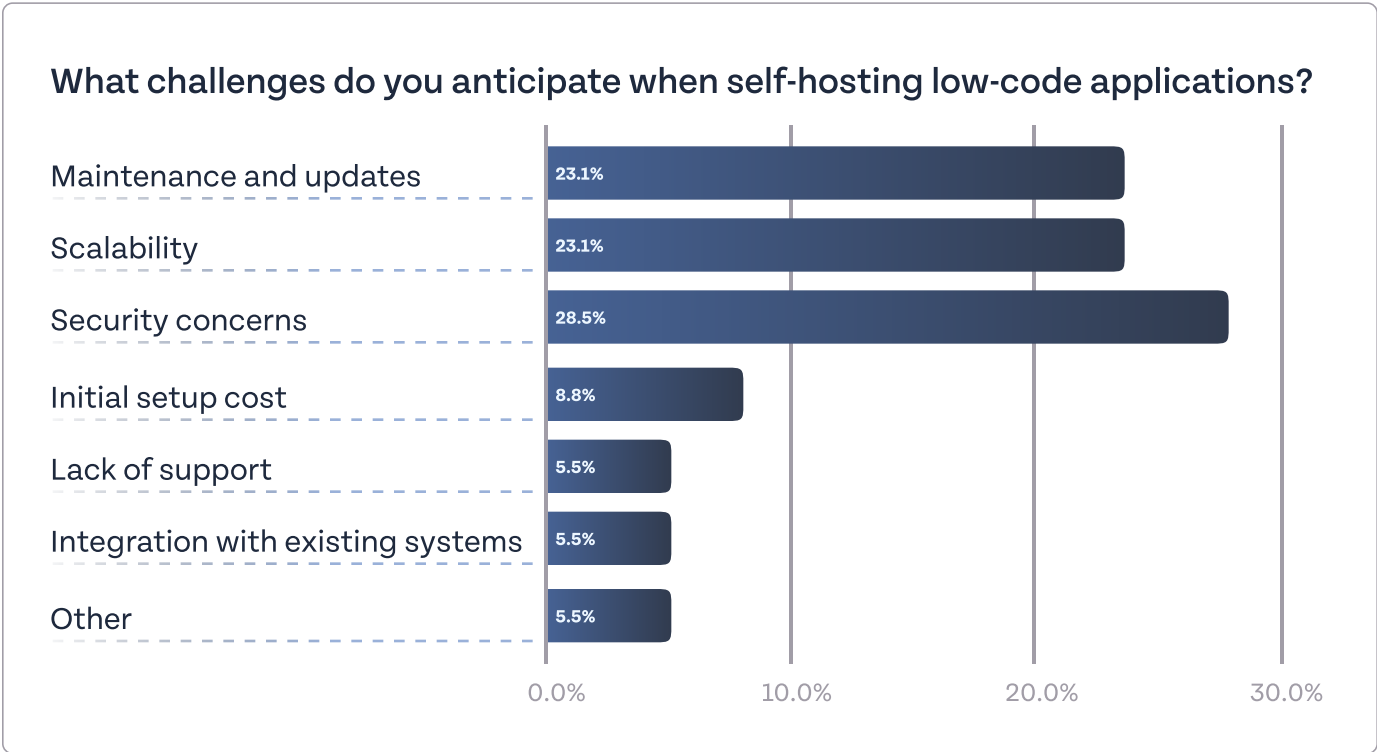
The promising outlook for self-hosting and open source

The future looks promising for self-hosted solutions, with 85% of respondents anticipating an increase in the adoption of self-hosted applications over the next 24 months. This could be attributed to businesses' ongoing need to strengthen their security measures and maintain tighter control over their data.

The sustained interest in self-hosting suggests that businesses recognize the long-term benefits of this approach and are investing in the necessary infrastructure to support it. Several general findings from the survey were:

- **A clear and growing preference for self-hosted solutions across various industries:** This trend is driven by a combination of cost savings, enhanced security, greater data control, and the flexibility to customize solutions.
- **The adoption of open-source software and AI integration**: These are playing a significant role in shaping self-hosting strategies. Open-source software allows businesses to modify source code to meet specific needs, while AI integration speeds up processes and reduces workload.
- **The rise of low-code platforms:** These offer a streamlined approach to developing and deploying self-hosted applications.

Looking ahead, we can expect this trend to continue, with more businesses investing in the necessary infrastructure and resources to support self-hosting. Additionally, the integration of AI and the use of low-code platforms will further enhance the capabilities and efficiency of self-hosted solutions.

> **Over the next 2 years, do you anticipate an increase or decrease in the adoption of self-hosted software?**
>
> Decrease — **15.4%**   **84.6%** — Increase
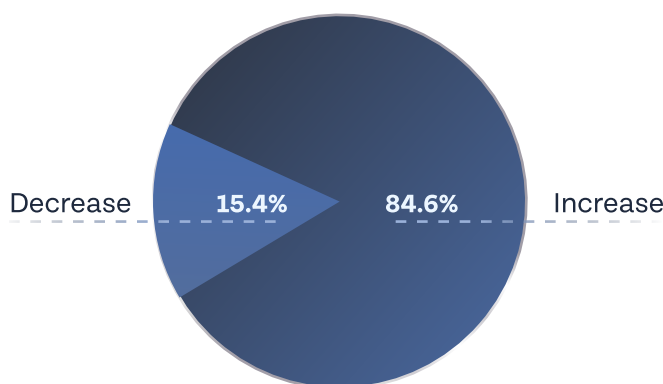
Appsmith: an open-source low-code platform that enables businesses to build critical self-hosted apps

As the shift towards self-hosting critical business applications increases, low-code open-source platforms offer a solution that provides greater control, allows for customization to fit business needs, and ensures cost-effectiveness. This approach combines the benefits of low-code development with the flexibility and security of self-hosting, creating a powerful solution for businesses.

Appsmith is an open-source low-code platform for building critical business applications with ease, while maintaining full control over infrastructure and data in self-hosted business solutions.

Appsmith accelerates development by providing drag-and-drop UI building with pre-built components. It also allows developers to manipulate data and add custom business logic to their apps in JavaScript, which is particularly crucial for critical business applications that often require unique functionalities and integrations.

Developers can connect to any database, SaaS tool, or REST/GraphQL API. Moreover, Appsmith's open-source nature gives businesses the added benefit of transparency, allowing them to inspect and modify the code to suit their specific needs.

Use case: customer 360 application using Appsmith

Businesses often need to have up-to-date data from across the organization in a single place. This consolidated view is crucial for making informed decisions and providing excellent customer service. Appsmith addresses this need by allowing you to consolidate data from various departments such as sales, CRM, support, and marketing into a single, comprehensive platform.

With Appsmith, you can create a centralized dashboard that pulls real-time data from multiple sources, providing a holistic view of your business operations and customer interactions. This integration capability is particularly valuable for building a customer 360 application.

```
┌──────────────────┐
│ Data integration │
│ and visualization│
└──────────────────┘

┌──────────────┐  ┌──────────────────┐  ┌──────────────┐  ┌──────────────┐
│ Secure access│  │ Connect to       │  │ Use pre-built│  │ Implement    │
│ control      │  │ multiple data    │  │ UI components│  │ custom JS    │
│              │  │ sources          │  │              │  │ logic        │
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┌──────────────────┐  ┌──────────────────┐  ┌──────────────────┐
│ Version control  │  │ Define user roles│  │ Set up granular  │
│ and collaboration│  │                  │  │ access control   │
└──────────────────┘  └──────────────────┘  └──────────────────┘

┌──────────────┐  ┌──────────────┐  ┌──────────────┐  ┌──────────────┐
│ AI-enhanced  │  │ Use Git      │  │ Implement    │  │ Conduct      │
│ customer     │  │ integration  │  │ feature      │  │ code reviews │
│ insights     │  │              │  │ branches     │  │              │
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┌──────────────┐  ┌──────────────────┐  ┌──────────────┐
│ Data security│  │ Implement        │  │ Use predictive│
│ and compliance│ │ sentiment analysis│ │ analysis     │
└──────────────┘  └──────────────────┘  └──────────────┘
```

Here's an example of how you can create a complete picture of each customer's journey in a customer 360 application built with Appsmith:

1. Data integration and visualization

The application connects to multiple data sources such as CRM systems, support ticketing tools, and sales databases using Appsmith's extensive datasource integrations. It displays a comprehensive view of customer information on a single dashboard.

- **UI components:** Use pre-built widgets like tables, charts, and cards to present customer data in an intuitive layout.
- **JS customization:** Implement custom logic to aggregate and process data from various sources, creating a unified customer profile.

Appsmith's extensive [datasource integrations](#) allow you to connect to various databases and APIs securely within your own infrastructure. This ensures that your critical business data remains under your control while enabling you to build applications that interact with multiple data sources efficiently.

2. Secure access control

Implement role-based access control to ensure that sensitive customer information is only accessible to authorized personnel.

- **User roles:** Define roles such as "Support Agent," "Sales Representative," and "Manager" with different levels of access.
- [**Granular Access Control (GAC)**](#)**:** Set up permissions at the widget level, allowing managers to view financial data while restricting access for support agents.

Appsmith provides granular access control, allowing you to define user roles and permissions at various levels. This ensures that sensitive data and functionalities are only accessible to the right users, crucial for maintaining security in your business applications.

3. Version control and collaboration

Use Git integration for efficient development and collaboration among team members.

- **Feature branches:** Develop new features or improvements in separate branches without affecting the main application.
- **Code reviews:** Implement a review process before merging changes to ensure code quality and consistency.

Git in Appsmith provides a comprehensive solution for managing your application throughout the software development life cycle (SDLC). It allows you to effectively maintain code quality, track changes, and roll back if needed.

4. AI-enhanced customer insights

Leverage Appsmith's AI to provide intelligent insights and automate certain processes.

- **Sentiment analysis:** Implement AI-powered sentiment analysis on customer interactions to assess satisfaction levels.
- **Predictive analytics:** Use AI models to predict customer churn risk or identify upsell opportunities.

You can use Appsmith's AI to improve your applications with features such as predictive analytics or automated decision-making. You can connect your applications to any LLM, and pair LLM chat functionality with custom JS objects and data to create threaded, contextual conversations or text generation within your apps.

5. Data security and compliance

Ensure that the customer 360 application adheres to data protection regulations and security best practices.

- **Data encryption:** Implement encryption for sensitive customer data both at rest and in transit.
- **Audit logging:** Set up comprehensive logging of all user actions for compliance and security monitoring.

For organizations with the highest security requirements, Appsmith offers an airgapped edition that allows critical business applications to run in completely isolated environments, free from external network connections.

Appsmith also implements robust data encryption, using AES-256 to protect sensitive information such as database credentials and Git SSH keys. These features ensure that organizations can maintain the highest levels of security and compliance while leveraging Appsmith's powerful low-code platform.

The rising trend: custom business applications with enhanced control and security

As businesses embrace and adopt open-source self-hosted solutions for their long-term benefits, we anticipate continued investment in infrastructure and resources to support this approach. The integration of AI, along with the use of open-source software and low-code platforms, will significantly enhance the capabilities and efficiency of self-hosted solutions in the years to come.

In light of these trends, platforms like Appsmith are well positioned to meet the evolving needs of businesses. Appsmith can help you build critical, customized applications while maintaining control over your data and infrastructure. Learn more about getting started with Appsmith. If you need more information to determine if Appsmith is the right fit for your needs, you can book a demo with our team.