

THE STATE OF INTERNAL TOOLS 2021

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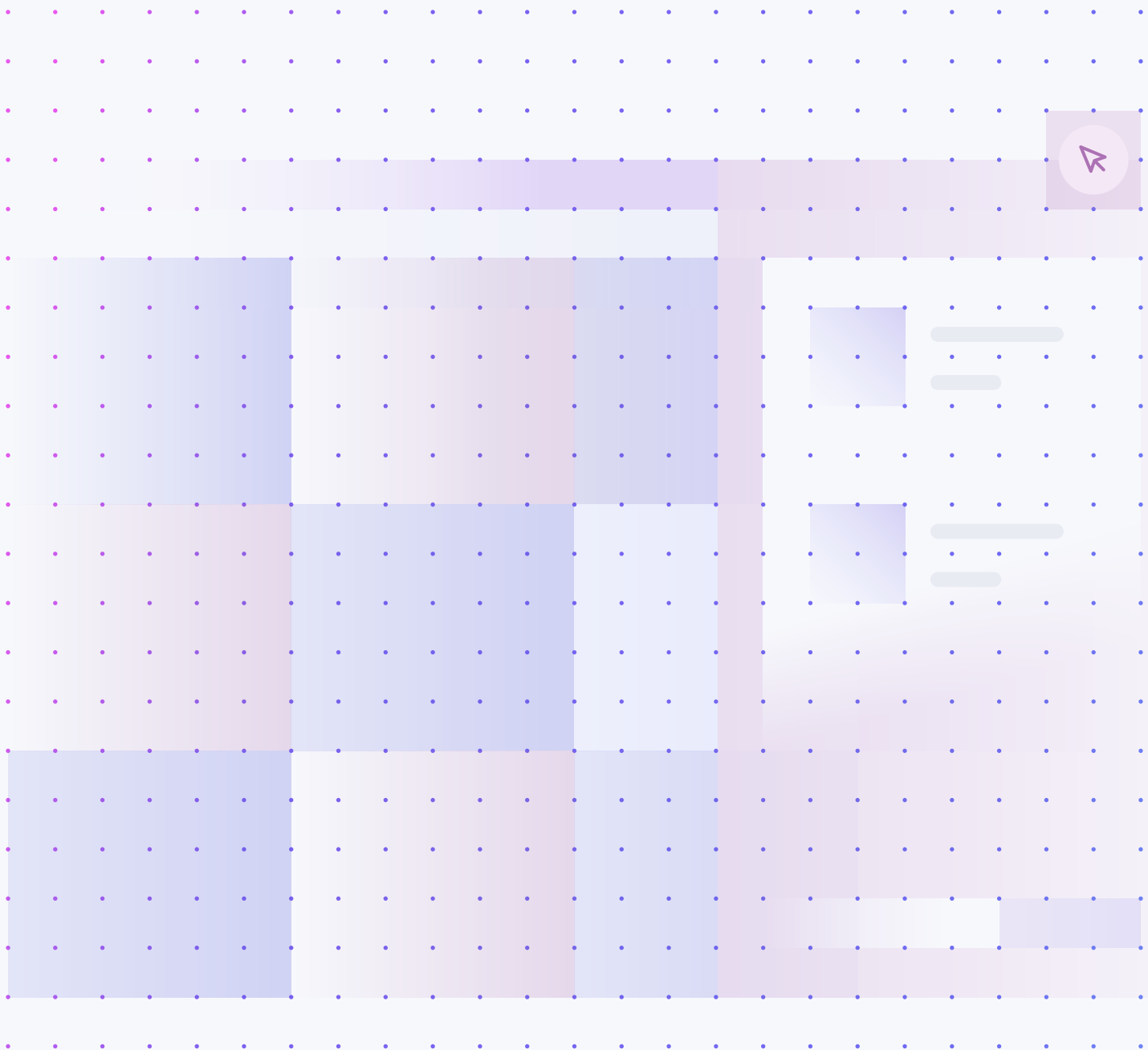
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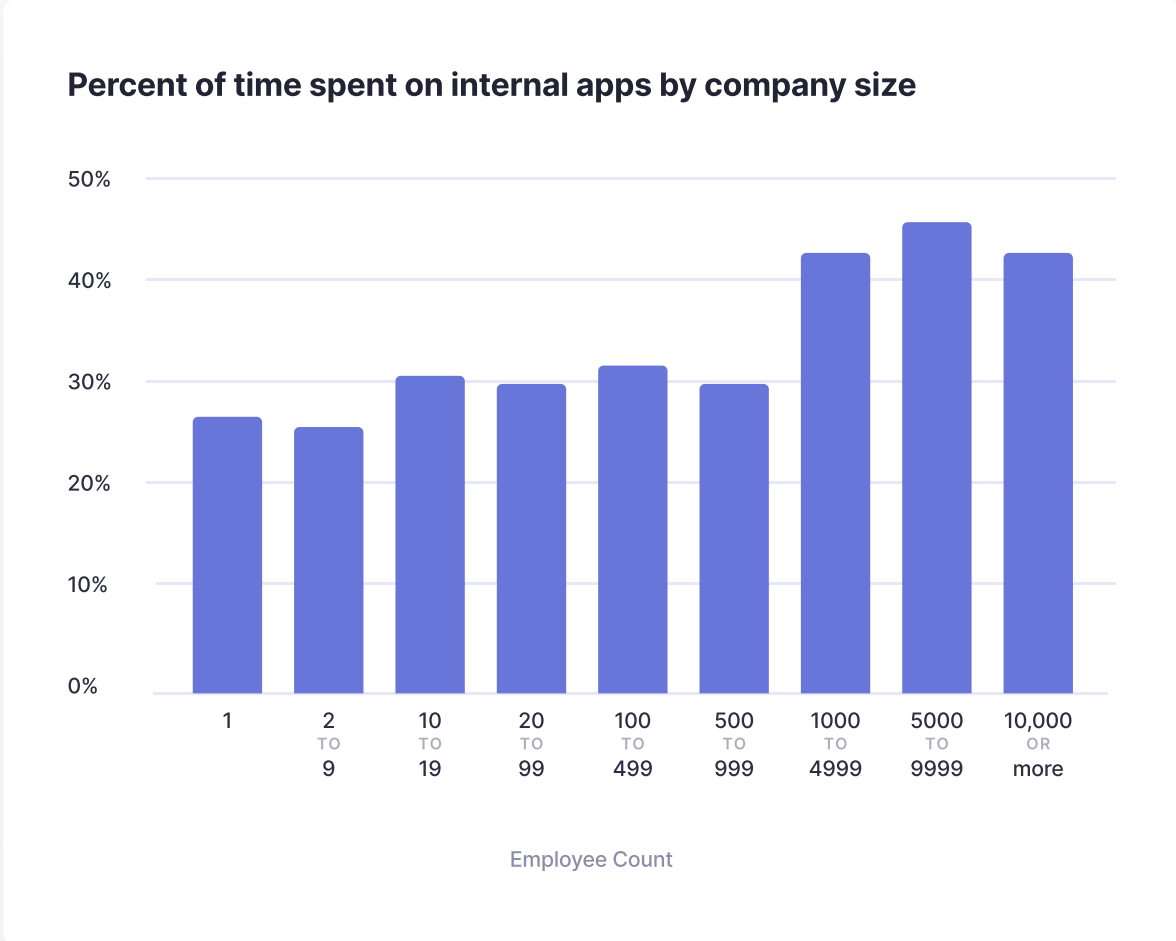
The digital shift in 2020 changed how businesses work

Over the last 12 months, businesses have shifted online or scaled to meet demand like never before. As a result, developers have had to enable constant change—across priorities, processes, technology, and more.

This report aims to identify trends in how developers build and resource internal applications to support other teams in getting critical work done, now and in the future.

Investments in internal apps are large (and growing)

On average, developers spend 34% of their time building and maintaining internal applications, and that number grows as employee count increases. Of all developers surveyed, 85% plan to make a similar or larger investment over the next 12 months.



COVID IMPACT

87%

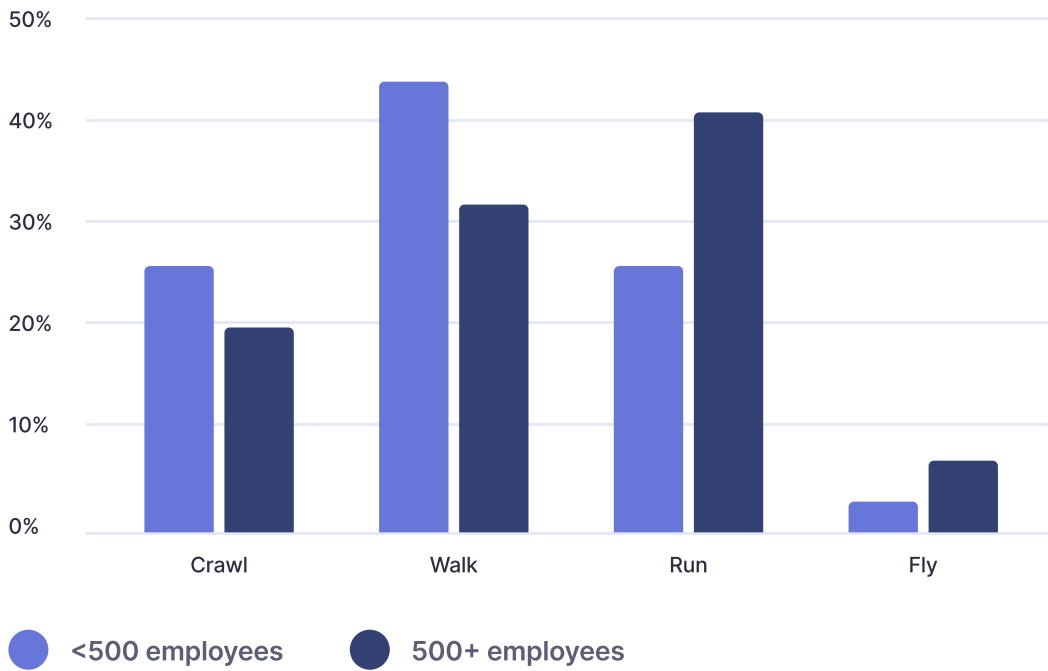
of developers **increased** or **maintained** their internal app investments in response to COVID-19.



Most developers believe they're early on the journey

65% of developers self-rated their internal application practices to be at a crawl or walk (read: low) maturity level. Developers at larger businesses are more likely to report mature practices, but less than 7% rate their practices as competitively differentiating (fly).

Self-assessed internal applications maturity (by employee count)



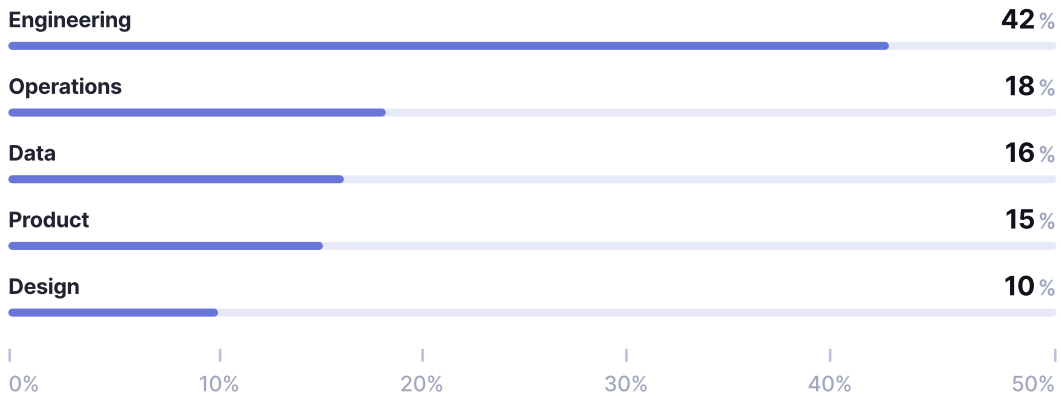
Internal application maturity levels

- Crawl** Getting the basics in place
- Walk** Have their core processes running, but much maturing to do
- Run** Continuously improving a built out practice
- Fly** Leading the industry with best-in-class processes and results

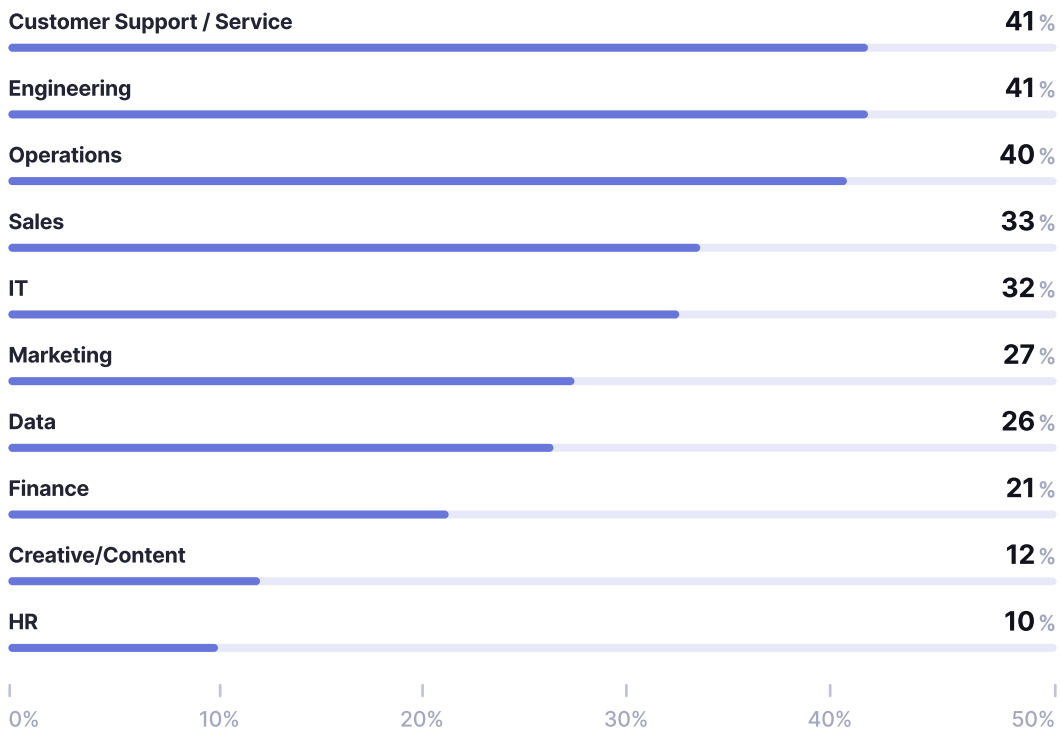
Dedicated technical teams serve diverse end users

More than 57% of developers reported at least one full-time employee dedicated to internal applications. These individuals and broader teams commonly support a range of both technical and non-technical departments.

The builders: For businesses with dedicated employees, where do they sit in the organization?

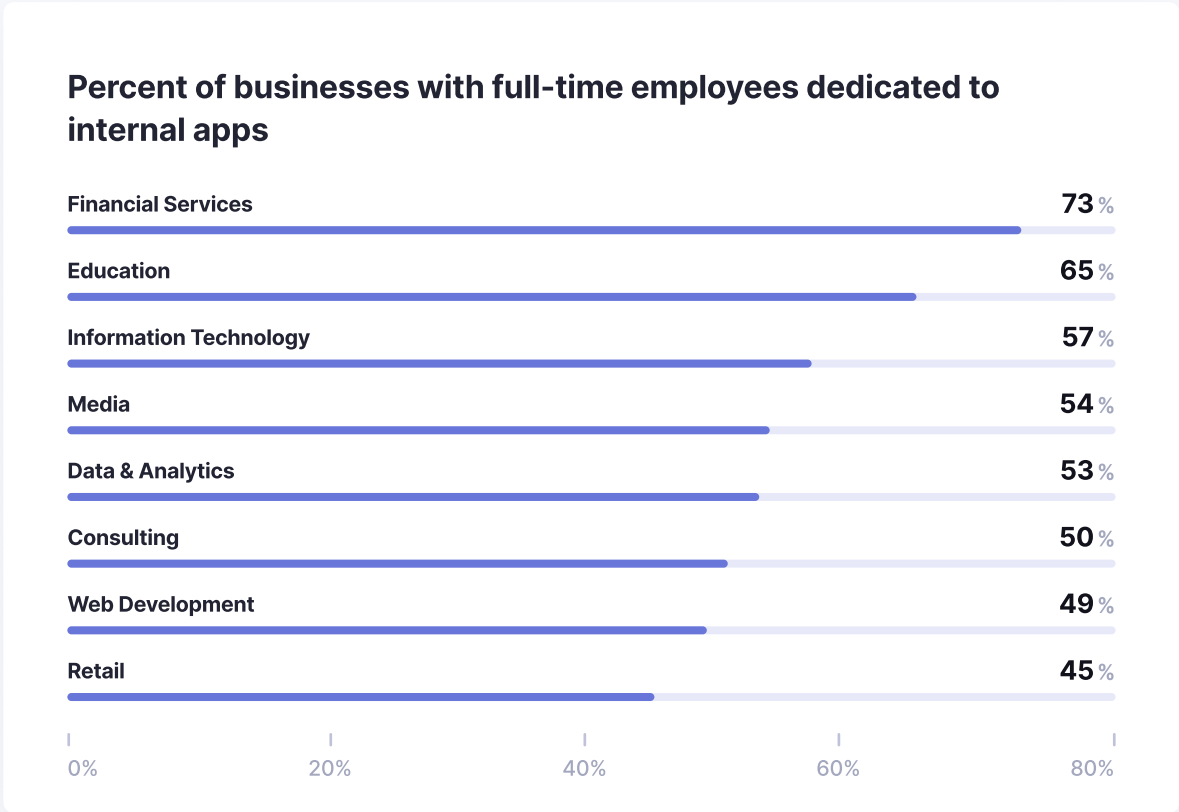


The end users: Which departments/teams are developers building internal tools to support?



Financial services and education invest most

In the financial services and education industries, around 2 in 3 businesses have dedicated developer resources. In most other industries, over 50% of businesses have dedicated full-time positions.



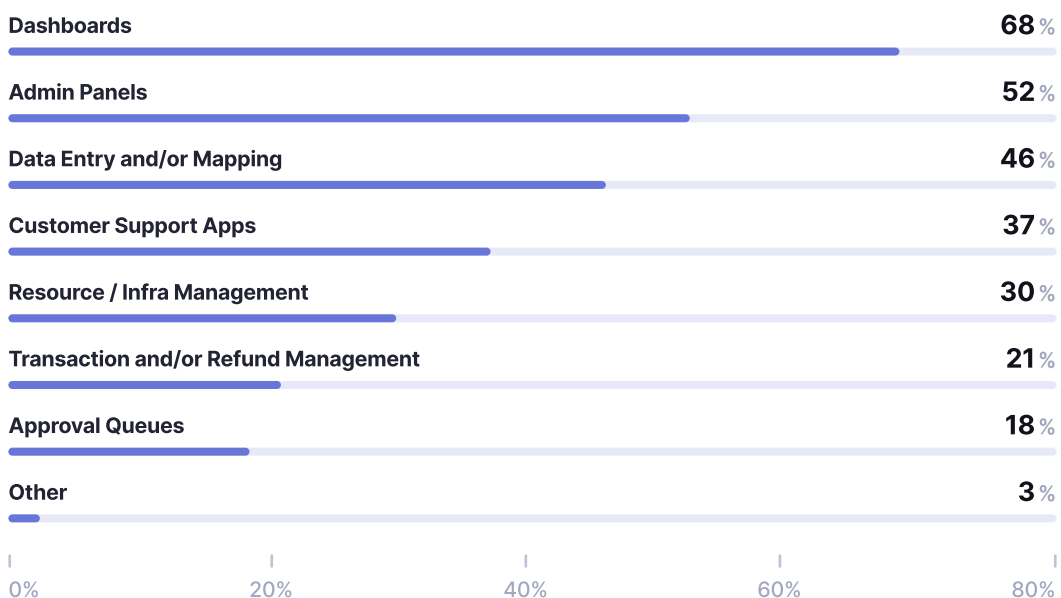
77%
of companies with 500+ employees have developers dedicated to internal apps



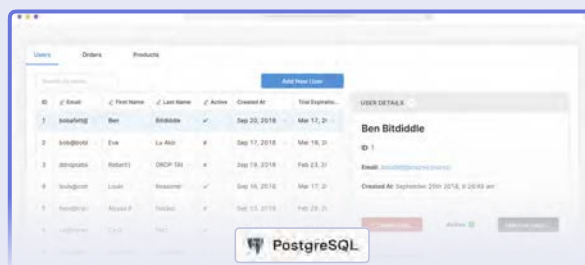
Information management is top use case

Developers are most commonly building applications like dashboards, admin panels, and data entry tools that help business teams manage operational information more efficiently.

Types of internal applications that developers build



EXAMPLE APPLICATION: POSTGRESQL ADMIN PANEL



Critical data is often stored in a database like PostgreSQL. Developers often build an internal app that helps non-technical employees read and write to the database without needing code.

Developers struggle with finding time and resources

55% of developers are struggling to find the time to build or maintain internal applications. However, developers with more mature practices are 34% less likely to struggle with resourcing and 45% less likely to struggle with ownership.

55%

Struggle with finding time and resources

33%

Struggle with tying impact to goals or revenue

27%

Struggle with setting clear ownership lines

24%

Struggle with unclear initial requirements

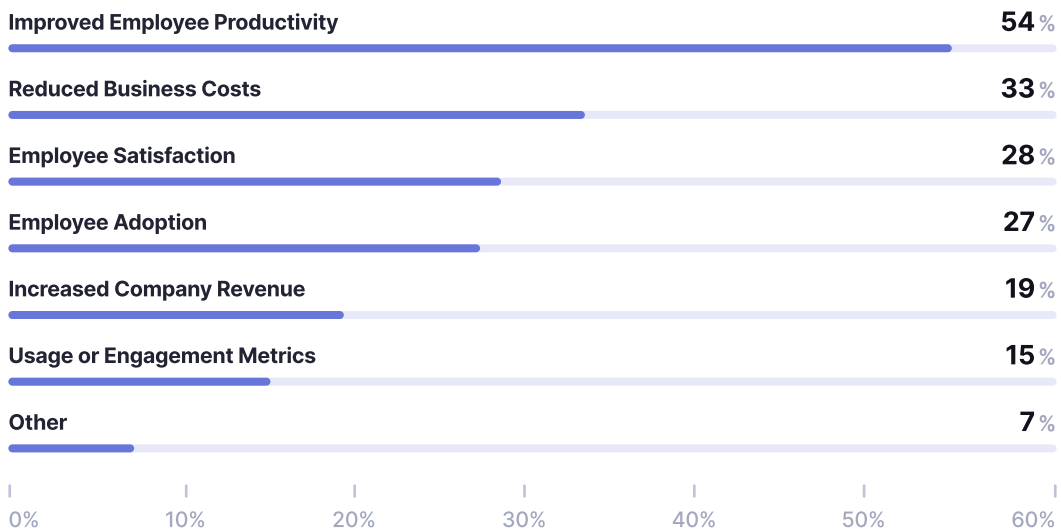
24%

Struggle with incremental asks

Employee productivity is the key success metric

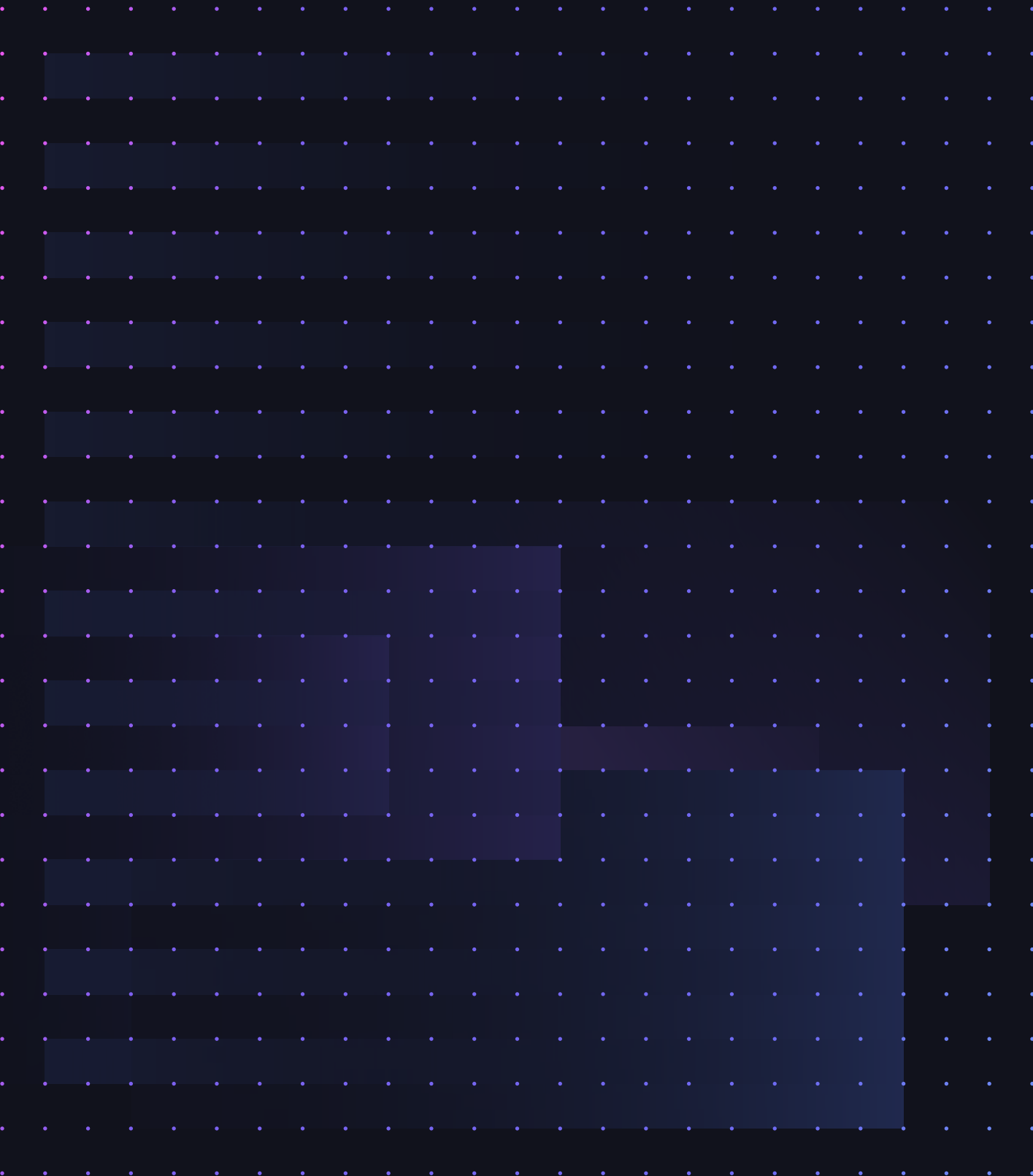
Developers are measuring return on investment through productivity gains and cost reductions. At every company size, internal tools support almost 1 in 3 employees and appear to be focused on driving department-wide leverage versus niche use cases.

How developers plan to measure ROI from internal apps



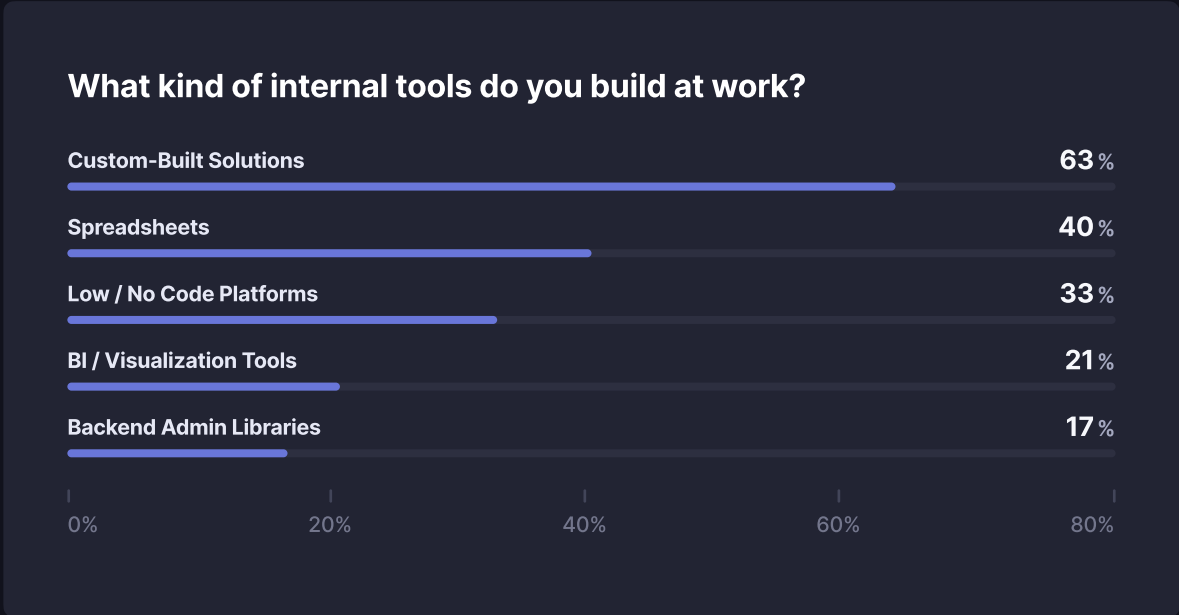
Technology Trends

How developers are building internal applications and the technology choices below the surface.



Developers default to custom-built solutions

Almost 2 in 3 respondents built a fully custom or home-grown internal application. Across every maturity level and industry, custom-built solutions secured the top spot as the most common way to build internal applications.



Developers prefer low/no code platforms

While low/no code platforms were only the 3rd most popular way to build internal applications, they ranked highest with developers on satisfaction, performance, and loyalty.

RANKING BY

Satisfaction. What percent of developers enjoy building this way?

#1	Low / No Code Platforms	89%
#2	Backend Admin Libraries	72%
#3	Custom-Built Solutions	67%
#4	BI / Visualization Tools	64%
#5	Spreadsheets	37%

RANKING BY

Performance. How many developers believe this meets their needs?

#1	Low / No Code Platforms	90%
#2	Backend Admin Libraries	83%
#3	Custom-Built Solutions	81%
#4	BI / Visualization Tools	73%
#5	Spreadsheets	57%

RANKING BY

Loyalty. How many developers plan to keep building this way?

#1	Low / No Code Platforms	89%
#2	BI / Visualization Tools	72%
#3	Custom-Built Solutions	67%
#4	Backend Admin Libraries	65%
#5	Spreadsheets	45%

Custom-Built Solutions

When building from scratch, developers have a lot of options for the technology choices behind their internal apps. Most developers today appear to be combining JavaScript and HTML/CSS with the simplicity and flexibility of React.

Top programming languages for internal apps

JavaScript	82 %
HTML / CSS	65 %
SQL	43 %
TypeScript	34 %
Python	31 %
PHP	16 %
Java	16 %
Bash / Shell / PowerShell	15 %
C#	10 %
Ruby	8 %
Go	7 %
Kotlin	4 %
C++	3 %
VBA	3 %
Swift	3 %
Scala	2 %

Top web frameworks for internal apps

React.js	59 %
Express	24 %
jQuery	20 %
Angular	18 %
Vue.js	18 %
Spring	8 %
Django	8 %
Ruby on Rails	8 %
Flask	7 %
Laravel	6 %
ASP.NET	6 %
Angular.js	6 %
ASP.NET Core	6 %
Gatsby	4 %
Symfony	3 %
Drupal	1 %

Custom-Built Solutions

While 81% of developers believe that custom-built solutions are meeting their needs, only 67% say that they plan to continue building internal apps this way in the future.

Developer experience with custom-built solutions

I enjoy building internal tools this way



Building internal tools this way meets my needs



I plan to build internal tools this way in the future

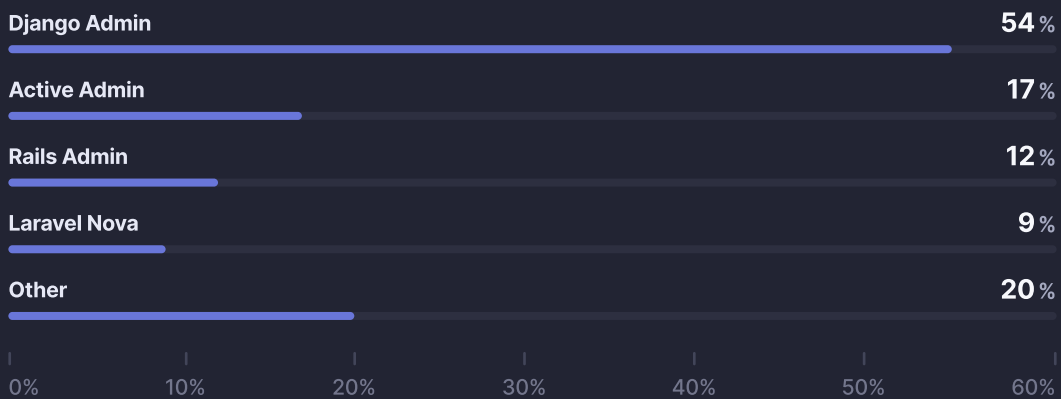


● Strongly Disagree ● Disagree ● Agree ● Strongly Agree

Backend Admin Libraries

Backend admin libraries can be an easy way to create internal tools on top of popular backend frameworks. Even though they are the least popular way to build internal apps, they ranked 2nd highest for both satisfaction and performance.

Top backend admin libraries for internal apps



Developer experience with backend admin libraries

I enjoy building internal tools this way



Building internal tools this way meets my needs



I plan to build internal tools this way in the future

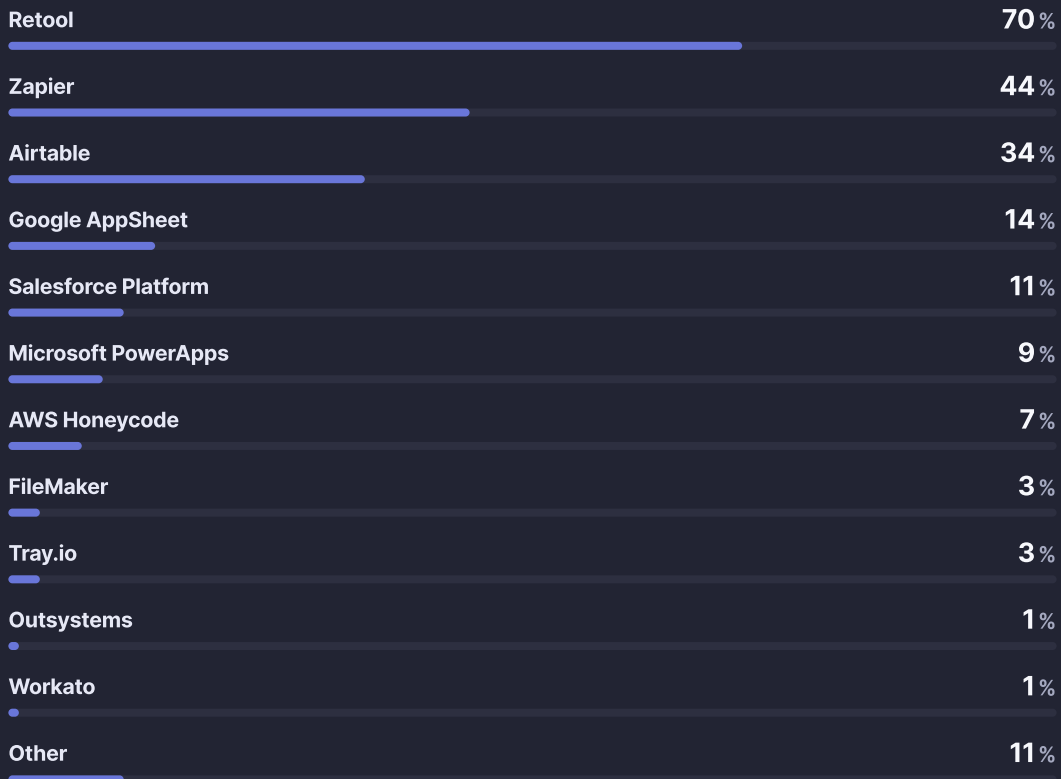


● Strongly Disagree ● Disagree ● Agree ● Strongly Agree

Low/No Code Platforms

By balancing the flexibility of building from scratch with the ease of drag-and-drop, low/no code tools delivered the top developer experience. Over 40% of developers strongly believe they will build this way in the future.

Top low/no code platforms for internal apps



Developer experience with low/no code platforms

I enjoy building internal tools this way



Building internal tools this way meets my needs



I plan to build internal tools this way in the future



● Strongly Disagree ● Disagree ● Agree ● Strongly Agree

Spreadsheet Applications

Spreadsheets ranked the 2nd most popular after custom-built applications, but scored the lowest in every category of developer experience—43% did not believe that building internal apps this way was meeting their needs.

Top spreadsheet tools for internal apps



Developer experience with spreadsheets

I enjoy building internal tools this way



Building internal tools this way meets my needs



I plan to build internal tools this way in the future

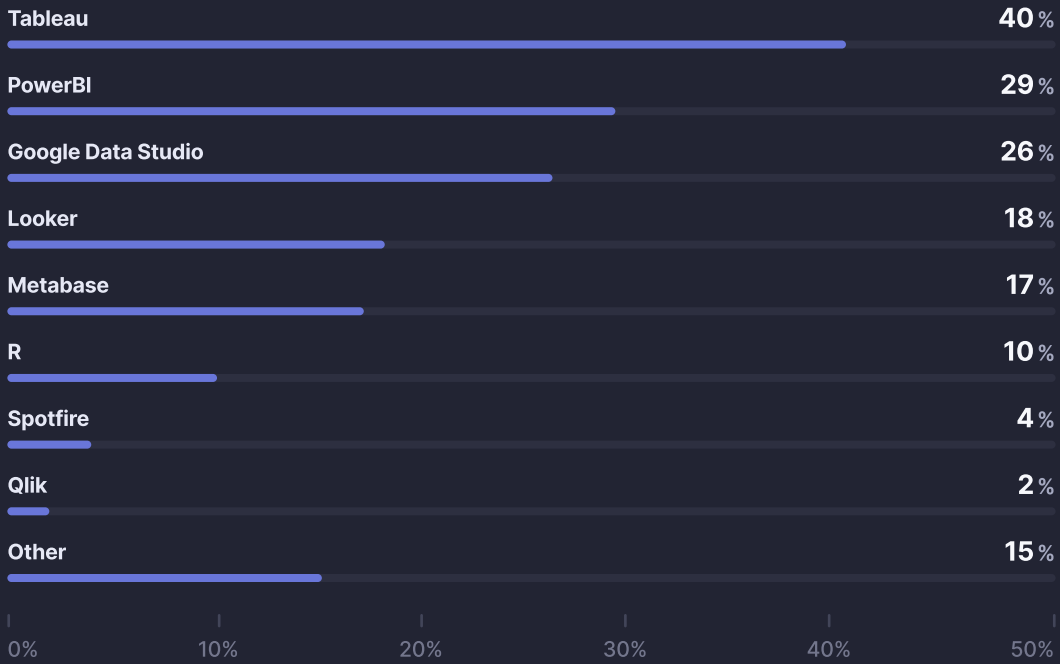


● Strongly Disagree ● Disagree ● Agree ● Strongly Agree

Business Intelligence & Visualization Tools

While not the most popular option for building internal applications, 71% of the developers that use BI and visualization tools plan to continue building this way in the future.

Top BI/visualization tools for internal apps



Developer experience with BI/visualization tools

I enjoy building internal tools this way



Building internal tools this way meets my needs



I plan to build internal tools this way in the future

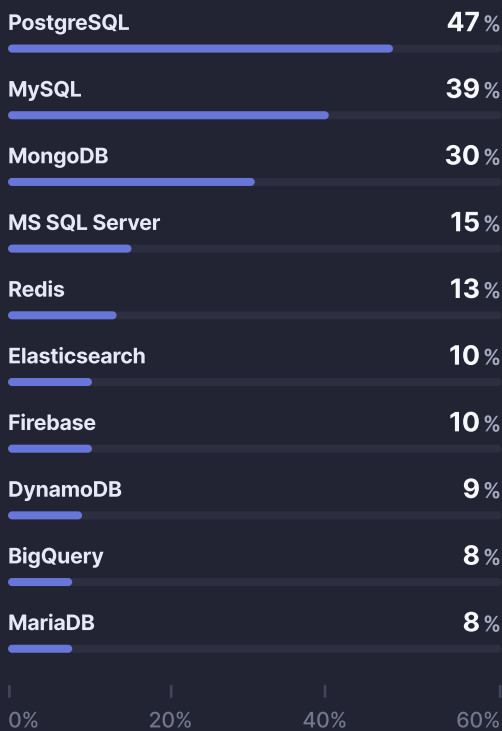


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 ● Disagree
 ● Agree
 ● Strongly Agree

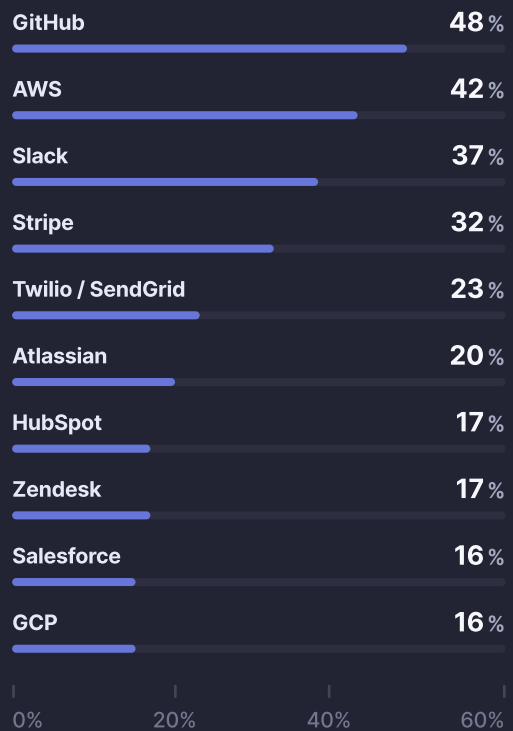
Internal applications are deeply connected

75% of the internal tools developers build are connected to internal databases and 67% to internal APIs. About half of internal tools are connected to 3rd party applications, ranging from marketing automation to developer workflow.

Top 10 internal databases for internal apps



Top 10 3rd party APIs for internal apps





Methodology

Retool combined our unique perspective in the internal application landscape with new insights from 650 developers and technical leaders to understand current and future trends related to internal applications and the future of work.

We collected these insights via a public survey that ran for one month and ended in March 2021.

Demographics

INDUSTRY (TOP 5)

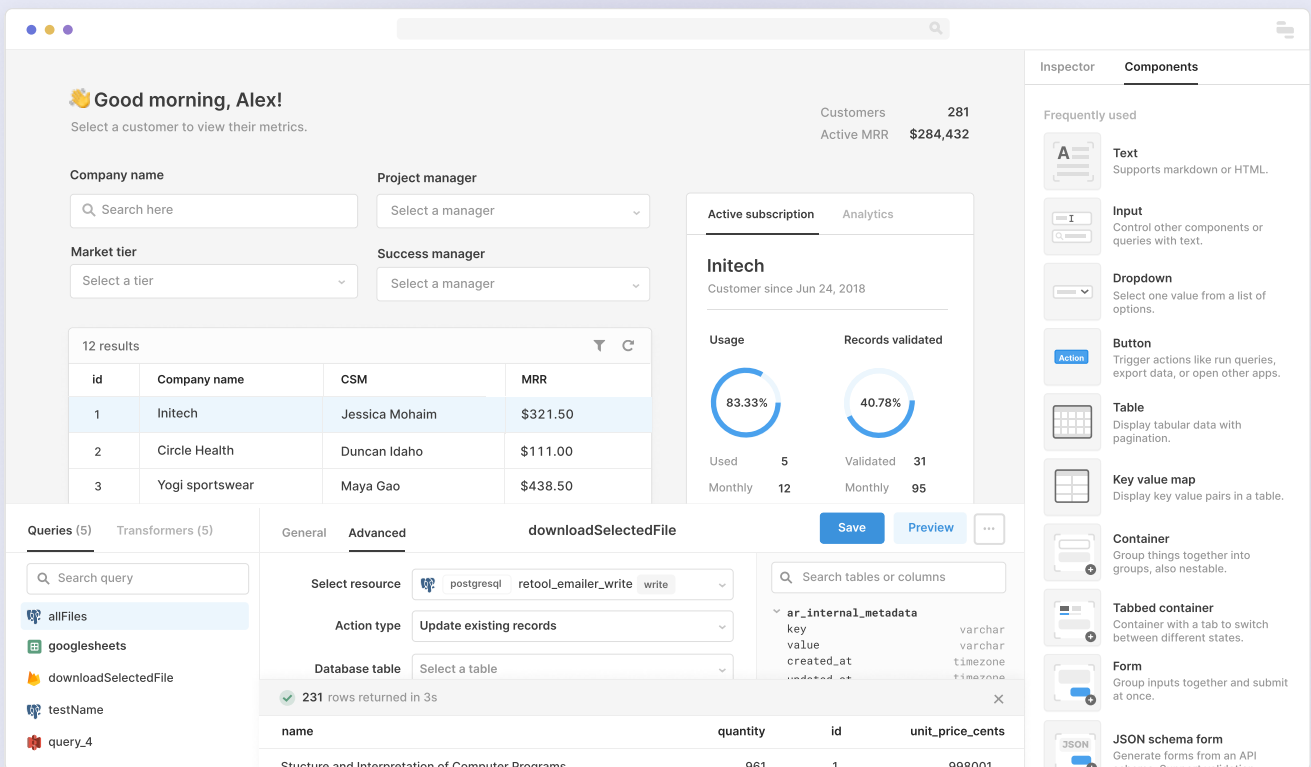
Information Technology 25.4% / 165
Financial Services 10.3% / 67
Consulting 8.9% / 58
Web Development 8.5% / 55
Education 8.0% / 52

ROLE (TOP 5)

Developer, Full Stack 35.7% / 232
Eng Manager, Director, VP 13.2% / 86
Developer, Front End 10.2% / 66
Developer, Back End 10.0% / 65
Founder 7.1% / 46

COUNTRY (TOP 5)

United States 39.5% / 257
India 10.2% / 66
United Kingdom 5.2% / 34
Germany 4.5% / 29
Canada 4.3% / 28



About Retool

Retool is a low-code platform that makes it fast and easy to build internal tools.

Business teams need custom apps, dashboards, admin panels, and other internal tools to run critical operations. Rather than build from scratch, developers can use Retool to build powerful tools, faster.

Our app builder includes drag-and-drop building blocks (e.g. components for tables, buttons, forms, charts) so you can assemble an app in minutes. From there, you can write custom code, connect to any data source, and build custom logic and queries to create exactly the right tools for your business.

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