



# 2025 Developer Skills Report

Inside the developer hiring, AI, and upskilling trends shaping 2025.

# Introduction

HackerRank is built on a simple idea: skills should matter more than pedigree. We help companies hire and grow developer talent based on real ability, not resume keywords, and champion a community of 26+ million developers pursuing their full potential. Each year, we survey that community to uncover the trends and challenges that shape reports like this one.

Hiring is up, yet 74% of developers still struggle to land jobs. The disconnect isn't about demand; it's about how companies hire, evaluate, and retain talent. Early-career developers have been hit the hardest, with junior hiring lagging behind as companies prioritize experienced talent. And even after getting hired, 40% of developers plan to leave within a year, driven by pay, career growth, and a search for meaningful work.

At the same time, AI is reshaping development and redefining performance. It's making developers faster—but not equally. The gap between casual AI users and deep adopters is growing, with heavy AI users reporting significantly higher productivity gains. Meanwhile, 67% of developers say AI has increased pressure to deliver faster, and leaders are raising expectations at an even higher rate.

With AI, developers finally have widespread access to the kind of learning that has never been practical at scale before: highly contextual, personalized tutoring. For the first time, developers can follow custom learning paths that adapt and grow with them. As with every major shift in technology, early adopters blaze the trail, and systems evolve in response. Developers are leading the way, but the companies that adapt quickly and embrace these new approaches will be the ones that attract, grow, and retain top talent.

**This report breaks down what's working, what's broken, and what companies need to rethink in 2025.**

# Executive Summary

**Hiring is up, but job searching is still tough—especially for early-career developers.** 74% of developers struggle to land jobs despite rising demand. Resume filters, slow processes, and leetcode-style tests that don't reflect real-world skills create friction and frustration, while junior hiring lags companies prioritize experienced talent.

**Developers aren't waiting for companies to invest in them.** 40% plan to leave within a year, prioritizing career growth and skill development. Without clear learning opportunities, companies risk losing talent—especially as AI makes self-driven upskilling easier than ever.

**AI is accelerating work—but not equally for everyone.** 97% of developers use AI, but deep adopters see greater gains while casual users lag behind. Nearly a third of code is now AI-generated, and companies expect faster output—raising pressure that developers may struggle to match.

**Too many hiring tests don't reflect real work.** 66% of developers prefer practical coding challenges, but outdated algorithmic tests persist. AI is making it easier to game assessments, raising fairness concerns—73% say it's unfair to lose out to AI-assisted candidates. Employers recognize the problem, but change is slow.

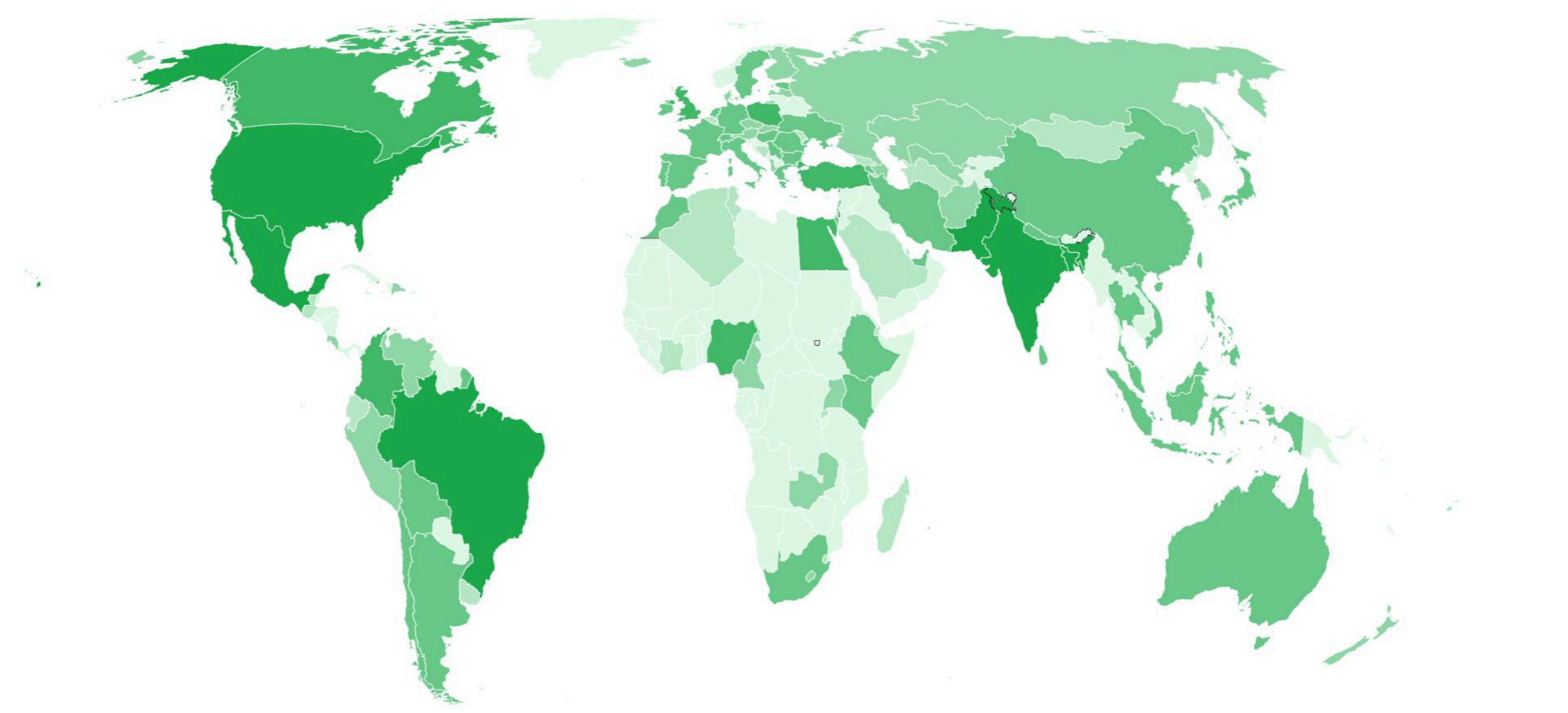
**Developers want visibility, but hiring friction is the bigger issue.** Open-source contributions, hackathons, and community engagement help attract talent, but AI-flooded pipelines and slow, complex hiring processes make it harder to connect with the right candidates. Too many developers filter out or drop out long before the offer stage.



# Methodology

The HackerRank 2025 Developer Skills Report is based on two proprietary data sources: aggregated platform insights and a global developer survey. With a global community of 26 million developers and data from over 3 million assessments per year, we have a uniquely comprehensive view of how developers learn, work, and get hired.

**We surveyed developers around the world 13,372 developers in 102 countries**  
from Afghanistan to Zambia



Source: HackerRank Developer Skills Survey

**This report combines these two sources to offer a data-driven look at the developer skills landscape in 2025.**

**HackerRank Platform Data**

Our platform captures millions of developer interactions each year. Unlike surveys that capture intent, platform data shows what developers actually do—how they engage with skills assessments, what they’re tested on, and how hiring behaviors evolve. For this report, we analyzed metrics like test invites, attempt rates, and active assessments to uncover hiring and skills trends.

**Developer Skills Survey**

We also surveyed 13,732 developers, engineering managers, recruiters, executives, and students across 102 countries in Q4 2024 and early 2025. This survey reveals how these groups think about their careers, learning, and the hiring process—giving critical context to the behavioral insights from our platform data.



Insight #1

# Tech hiring is back, but landing a job still feels impossible

**Hiring is up, but finding a job isn't easier.** 74% of developers still struggle to land roles.

**The hiring recovery favors senior talent.** Junior hiring remains weak.

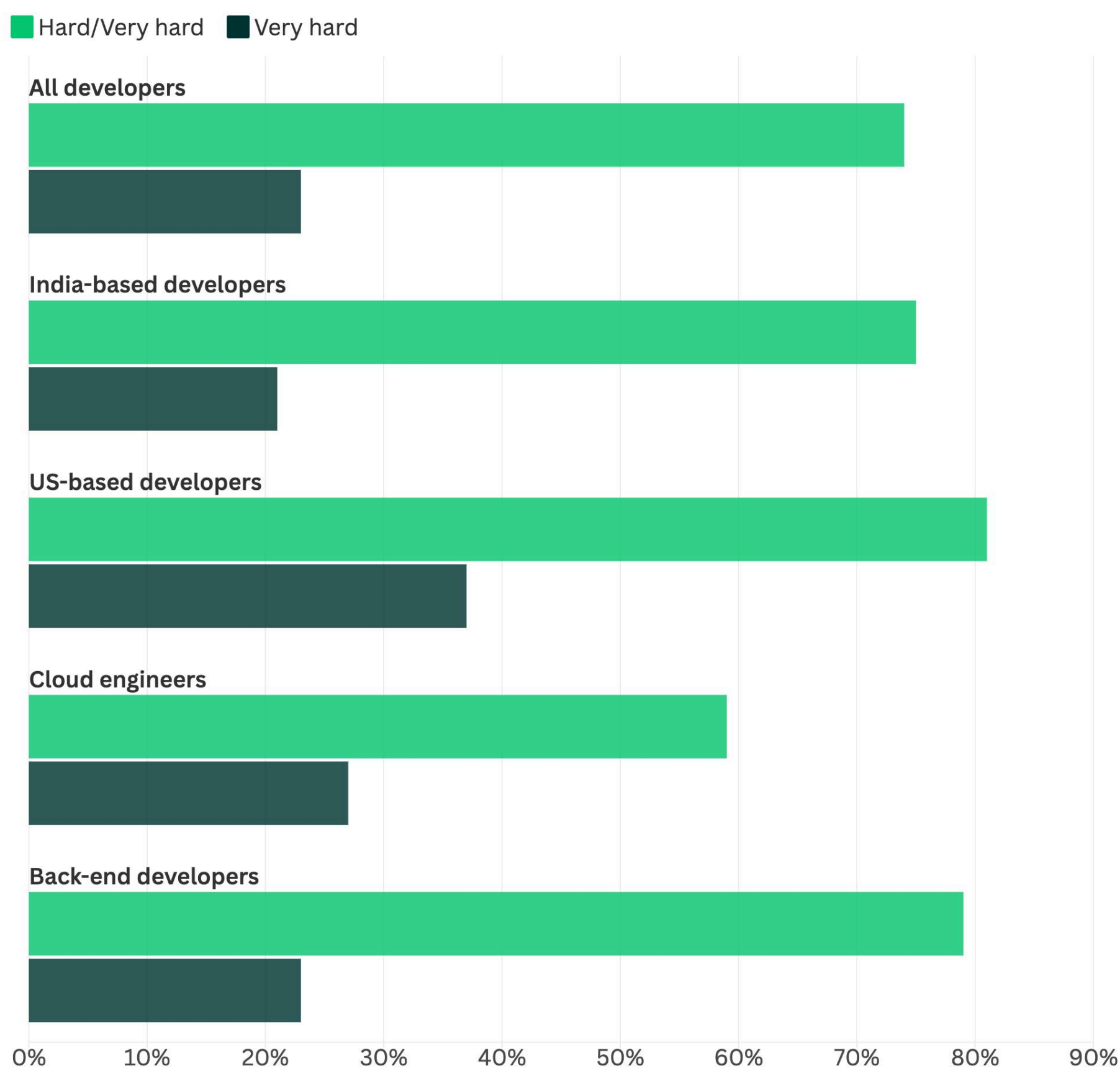
**Developers are frustrated by hiring friction.** From ghost jobs to slow responses and assessments that don't reflect real-world skills.

**This is a moment to lead.** Forward-thinking companies can transform hiring into a competitive edge.

# Three out of four developers say it's still hard to land a tech job

Despite improving conditions and a rebounding hiring market, 74% of developers say finding a job remains difficult. Just how difficult varies by geography, experience level, and role. For example, US-based developers report greater struggles, while a comparatively low 59% cloud engineers say the job search is hard. More companies are hiring, but that hasn't made the job search any easier for developers. Many still face long waits, unclear expectations, and barriers that feel disconnected from their actual skills.

## 74% of developers say it's hard or very hard to land a tech job today



The issue isn't a lack of roles—it's **how hiring happens, especially for early-career developers.**

Source: HackerRank Developer Skills Survey


# Developers are frustrated by the layers of friction in hiring

The job search isn’t just about finding open roles—it’s about navigating the barriers between developers and offers.

- **Ghost jobs waste time.** Developers apply for roles that don’t actually exist, never get filled, or vanish without explanation.
- **Resume filters block strong candidates.** With AI-generated resumes flooding applications, companies rely on screeners—but strong developers can get lost in the process.
- **Companies take too long to respond.** Many candidates wait weeks for updates—or get ghosted entirely.
- **Hiring processes are a mess.** Too many rounds, unclear expectations, and inconsistent evaluations make it hard to know what companies actually want.

Even as hiring picks up, these challenges make landing a job harder than it should be. But they also highlight exactly where companies can improve.



# Hiring recovery favors senior talent

Hiring signals, such as test invites, are up across the board, but growth in 2024 skewed toward senior roles. Companies are expanding their developer teams, yet early-career hiring remains sluggish compared to senior- and lead-level roles.

## Year-over-year, hiring activity for:

- **Lead developers** is up 22%
- **Senior developers** is up 19%
- **Junior developers** is up just 9%
- **Entry-level hiring** is nearly flat at 7%

## Hiring activity favored senior and lead roles in 2024



Early-career developers are still feeling the aftershocks of 2023’s hiring downturn, when their roles were among the hardest hit.

Source: HackerRank Platform Data

What’s behind this lag in early-career hiring? While we don’t have the data to point to a single, definite cause, several possible factors come to mind:

- **Cautious recovery** — Companies may be prioritizing experienced talent they can build teams around
- **AI impact** — A fundamental shift may be underway as AI reshapes junior developer responsibilities
- **Concerns about coding ability** - Employers may be hesitant to hire because they’re unsure early-career developers can code without heavy AI assistance.
- **Higher expectations** — Companies are seeking hires who can deliver immediate value, rather than investing in junior training.

These trends raise important questions about the long-term health of the developer pipeline—and whether companies are setting themselves up for future talent shortages.

# What this means for hiring

Hiring is picking up, but developers aren’t feeling it. If there are more jobs, but the job search remains just as tough, the problem isn’t the market—it’s the hiring process. Outdated hiring practices that create unnecessary friction, particularly for early-career talent.

**As hiring continues to recover, companies have an opportunity to rethink how they evaluate and engage developer talent.**


## Insight #2

# Developers aren't just working jobs. They're building careers.

**Developers prioritize career growth and staying ahead of new technologies.**

Adaptability is key.

**Why developers leave.**

—Low pay, lack of growth prospects, unchallenging work.

**40% of developers plan to leave within a year.**

They won't wait for companies to invest in them.

**If companies don't invest in developers, developers invest in leaving.**

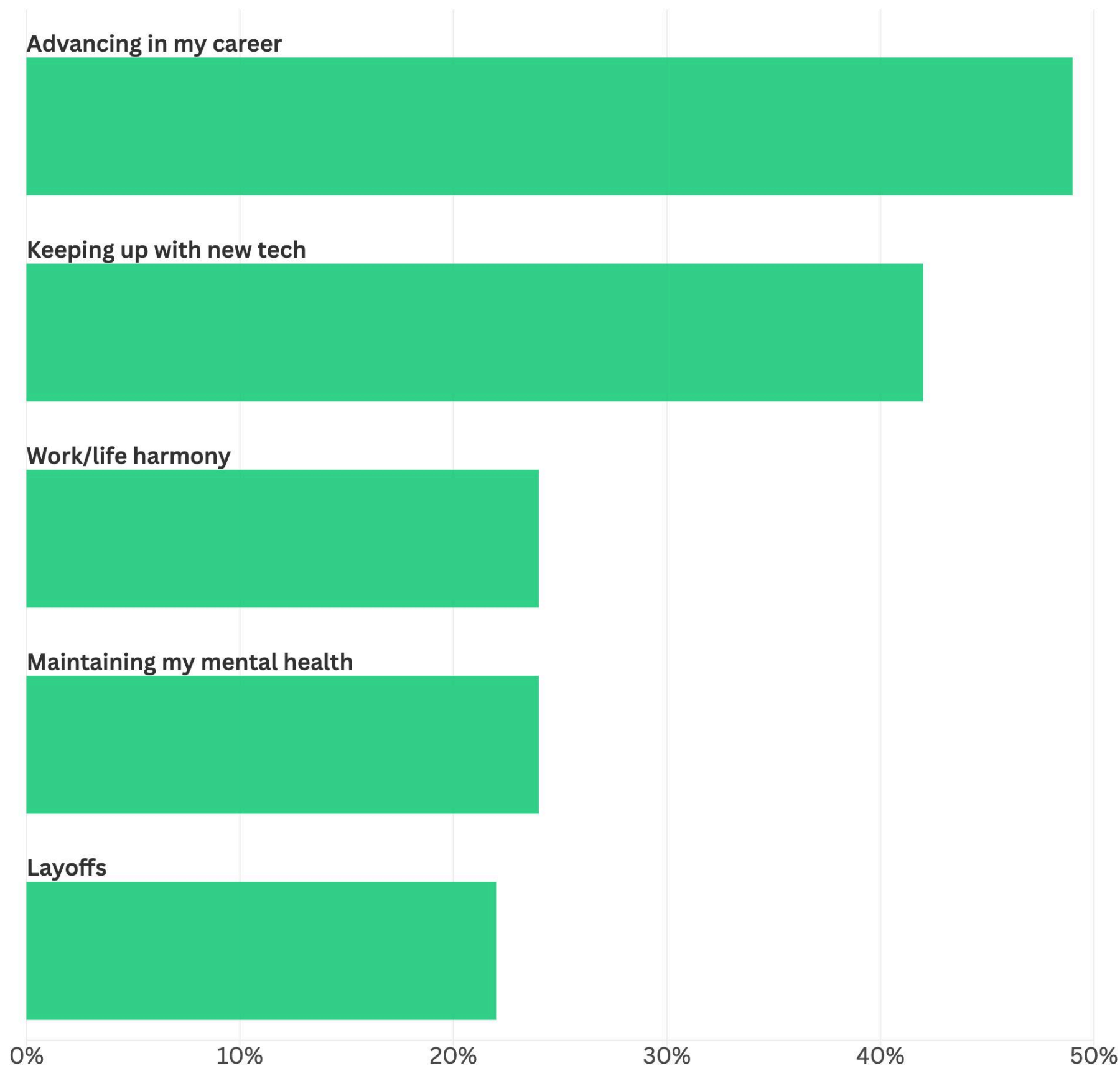


# Developers prioritize career growth and keeping up with new technologies

Developers are thinking beyond the job they’re in: their biggest concerns in 2025 are advancing their careers and keeping up with new tech. AI and other advances are shifting what it takes to stay competitive, and developers know they can’t afford to fall behind.

Work-life harmony, mental health, and layoff concerns still matter, but they take a backseat to growth and adaptability.

## Developers' biggest concerns in 2025



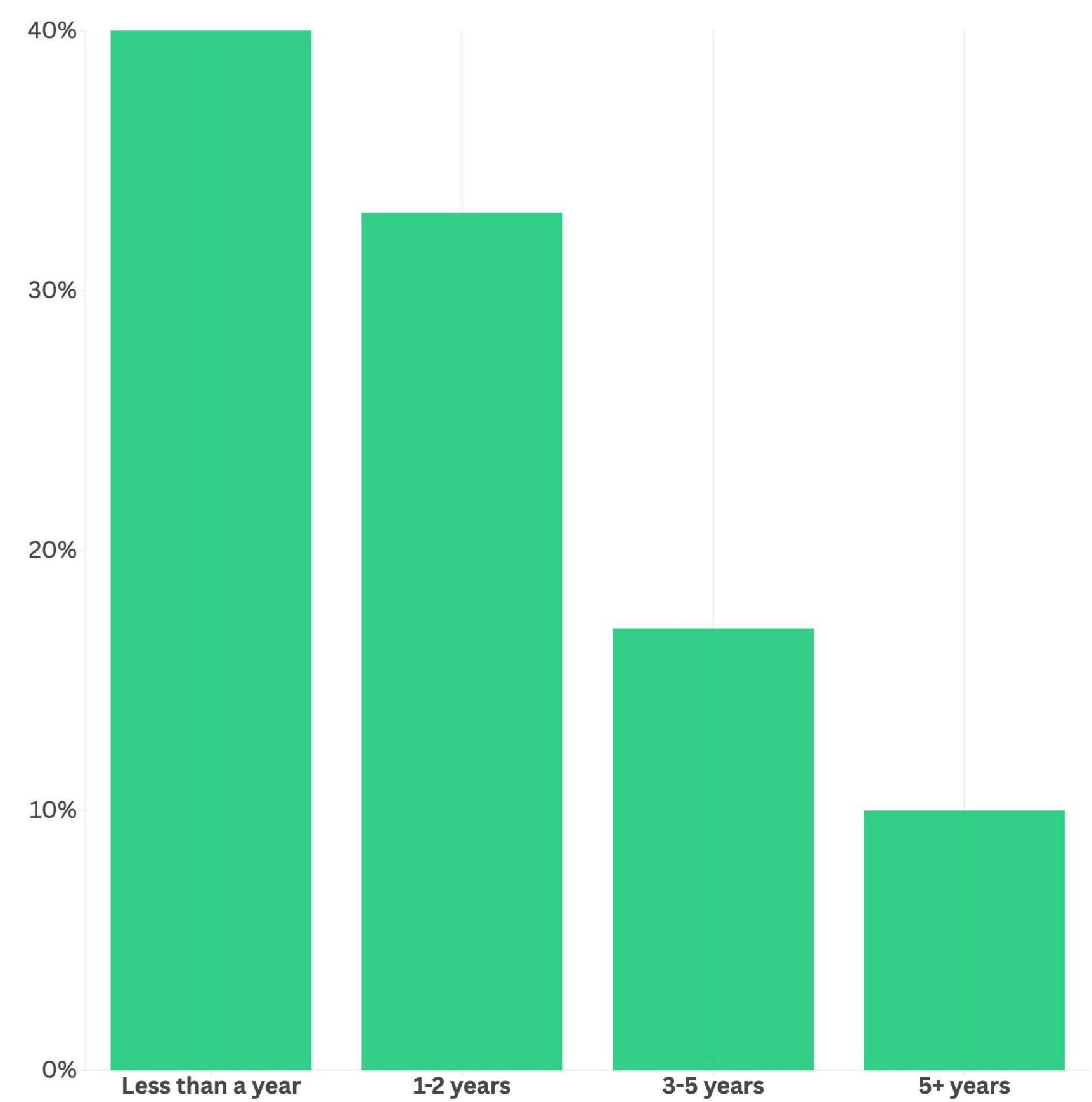
Even as hiring rebounds, 34% of US-based developers remain concerned about layoffs, underscoring the lasting impact the recent waves of tech layoffs have had on many.

Source: HackerRank Developer Skills Survey

# 40% of developers plan to leave this year

4 in 10 developers plan to leave their current company within a year, and only 27% expect to stay beyond two.

## How long do you plan to stay at your current company?



Even as hiring rebounds, 34% of US-based developers remain concerned about layoffs, underscoring the lasting impact the recent waves of tech layoffs have had on many.

Source: HackerRank Developer Skills Survey

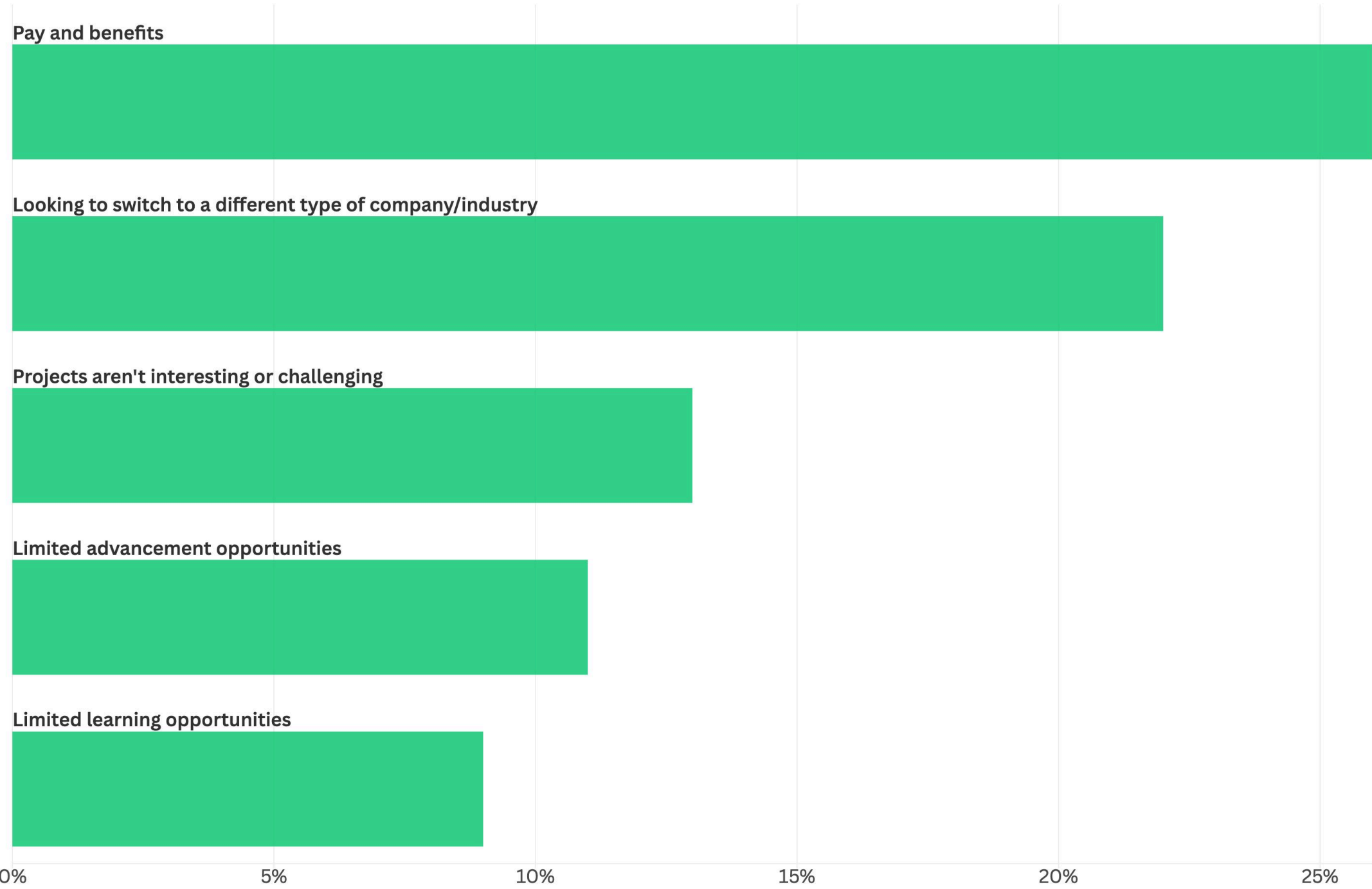
# Pay them, challenge them, or lose them

We followed up with developers to understand what’s driving them to leave:

- **Pay comes first.** If compensation isn’t competitive, nothing else matters.
- **Many are done with their industry.** Developers aren’t just switching jobs—they’re switching fields.
- **Unsatisfying work drives developers out.** No challenge, no innovation, no reason to stay.
- **No growth, no future.** If they can’t advance, they’ll move on.

The takeaway? If companies don’t invest in their developers—whether through pay, career growth, or meaningful work—developers will invest in themselves. And that may well mean leaving.

## Top reasons developers plan on leaving



Source: HackerRank Developer Skills Survey



Insight #3

# Developers are coding faster with AI —and expectations are catching up

**AI is embedded in development workflows.** 97% of developers use at least one AI assistant, but adoption and use cases vary across tools.

**AI accelerates work, but not equally for everyone.** The developers leaning into AI the most are getting more done and completing projects faster.

**AI-generated code is rising.** Nearly a third of code is AI-generated, and developers using multiple AI tools rely on them more heavily.

**Expectations may be rising faster than productivity.** They're using it, they know its strengths, but they also know the hype can go too far.

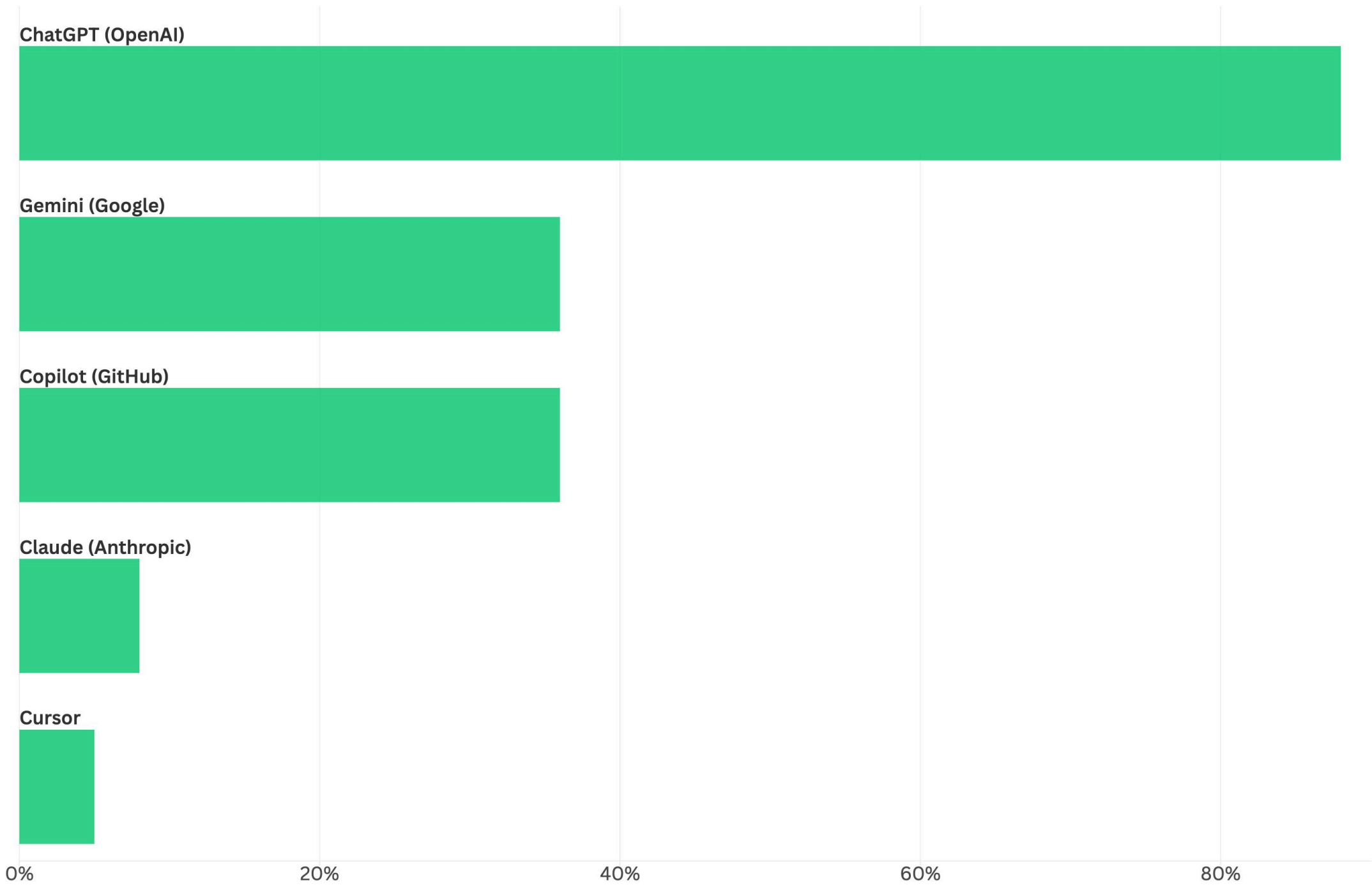
# Developers aren’t choosing one AI tool—they’re stacking them

AI-assisted development is no longer about a single tool. 97% of developers use AI assistants, and 61% now use two or more AI tools at work, jumping between chat-based LLMs like ChatGPT, Gemini, and Claude, as well as blending them with developer-focused tools like GitHub Copilot and Cursor.

ChatGPT remains a staple of developers’ AI toolkits, with 89% naming it as one of their most-used AI tools for work—up 13 points from last year. But this isn’t an “either-or” decision—it’s ChatGPT and, not ChatGPT or. 80% of Cursor users also use ChatGPT—as do 84% of Copilot users and 93% of Gemini users.

Why does ChatGPT remain dominant? First-mover advantage, accessibility, and habit all play a role. Unlike IDE-specific tools, it’s free, widely available, and easy to use across any coding environment. Even as developers embrace more specialized AI tools, ChatGPT remains the default AI assistant in an expanding AI stack.

## AI tools most used at work



Source: HackerRank Developer Skills Survey

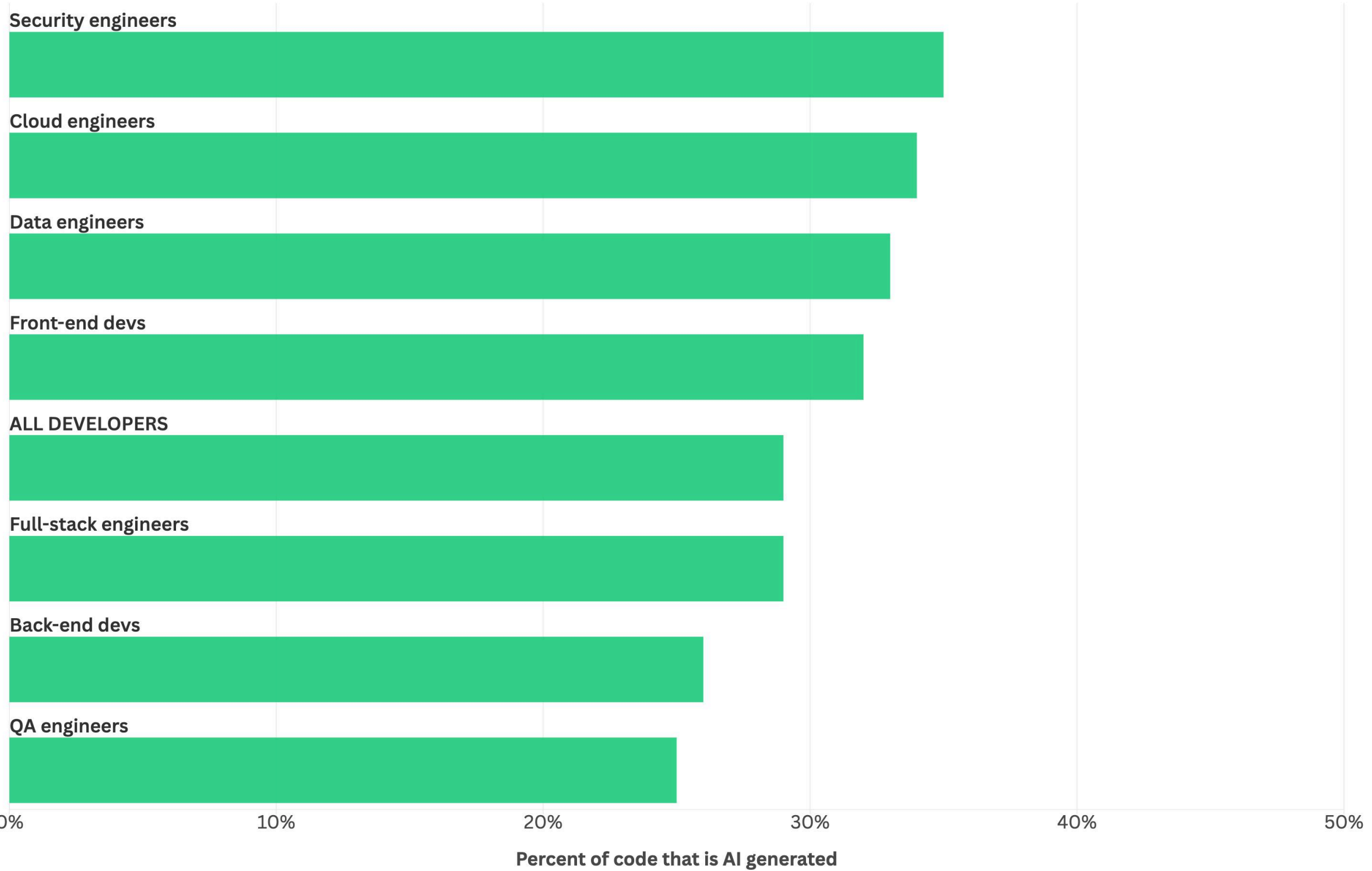
# AI isn't just assisting, it's generating a growing share of code

Developers are writing less of their own code as AI becomes more deeply integrated into their workflows. On average, AI now generates 29% of developers' code, but that number varies widely depending on usage patterns and job role.

Security, cloud, and data engineers lead the way in AI-generated code, reflecting both the nature of their work and their early adoption of AI-assisted development. For some, the shift is even more dramatic—15% of developers report that AI generates more than half of their code.

At a tool level, Claude and Cursor show a slight but notable shift toward higher AI-generated code percentages. This growing utilization isn't just about convenience—it's about early adopters pushing AI deeper into their development process.

## Nearly a third of code is AI-generated



Source: HackerRank Developer Skills Survey



# There’s an AI acceleration gap, and early adopters are pulling ahead

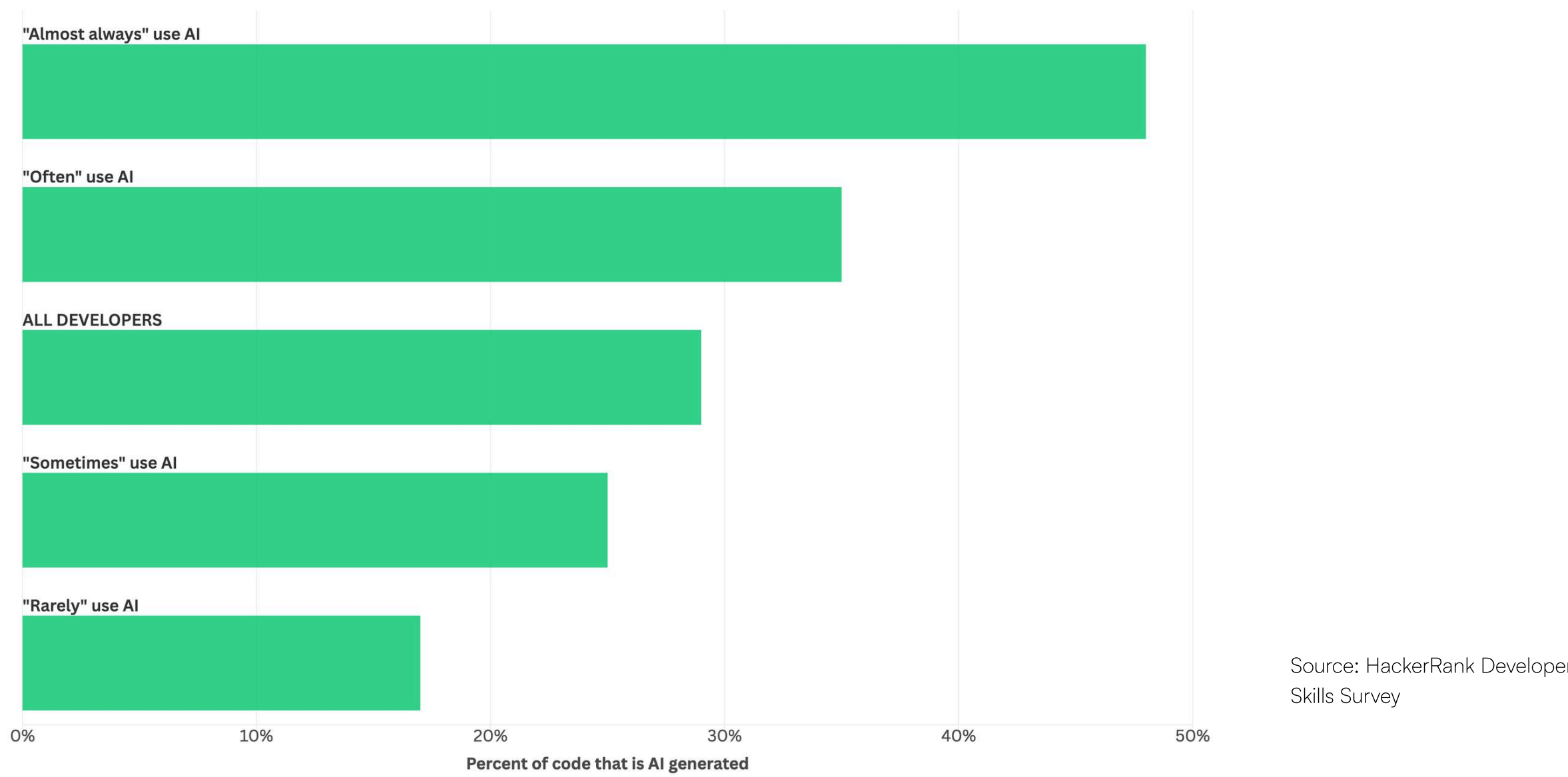
AI is making developers faster—but how much faster depends on how deeply they use it.

At a broad level, the shift is undeniable. 85% of developers say AI helps them complete projects faster. But there’s a clear divide between those who dabble in AI and those who go all in.

AI generates 29% of developers’ code on average, and only 15% say it writes more than half their code. But among the heaviest users, those numbers climb sharply. Developers who “almost always” use AI tools report that 48% of their code is AI-generated, and for 37% of them, AI now writes the majority of their code.

That’s a huge delta. And it shows up across the board—Claude and Cursor users report higher efficiency gains, too, likely because they’re also the ones using AI more frequently and across more tasks.

## Heavy AI users report higher AI-generated code rates



Something to ponder: Is AI making these developers faster, or are they already wired to move faster?

The early adopters—the developers integrating AI into their work the most—are the same ones most likely to explore different tools, experiment, and refine how they use AI. They’re getting value from it sooner, getting better results, and then reporting faster work as a result.

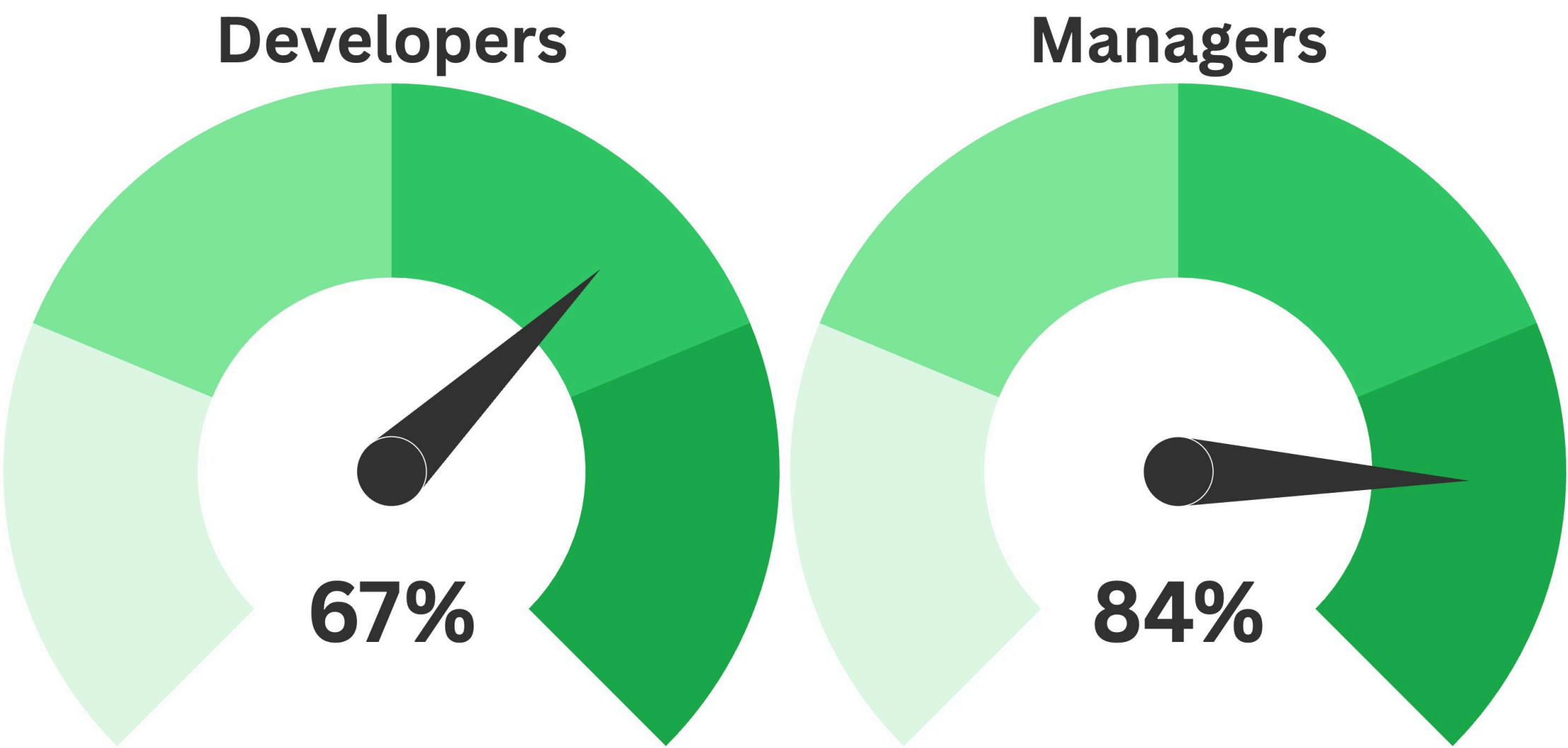
But is this AI’s doing? Or are these developers just better at making the most of new tools?

# AI is raising expectations across the board

67% of developers say AI has increased pressure to deliver faster. But leadership is pushing even harder—84% of engineering leaders say they’ve raised productivity expectations for their teams.

That 17-point gap reveals a growing disconnect: leaders see AI-driven acceleration, but developers feel the weight of it. As AI adoption scales, expectations are shifting faster at the top than on the ground. The question is whether companies are adjusting to reality—or just assuming AI makes everything instant.

## AI has raised productivity expectations



Source: HackerRank Developer Skills Survey

# Developers rely on AI for learning, code review, and debugging

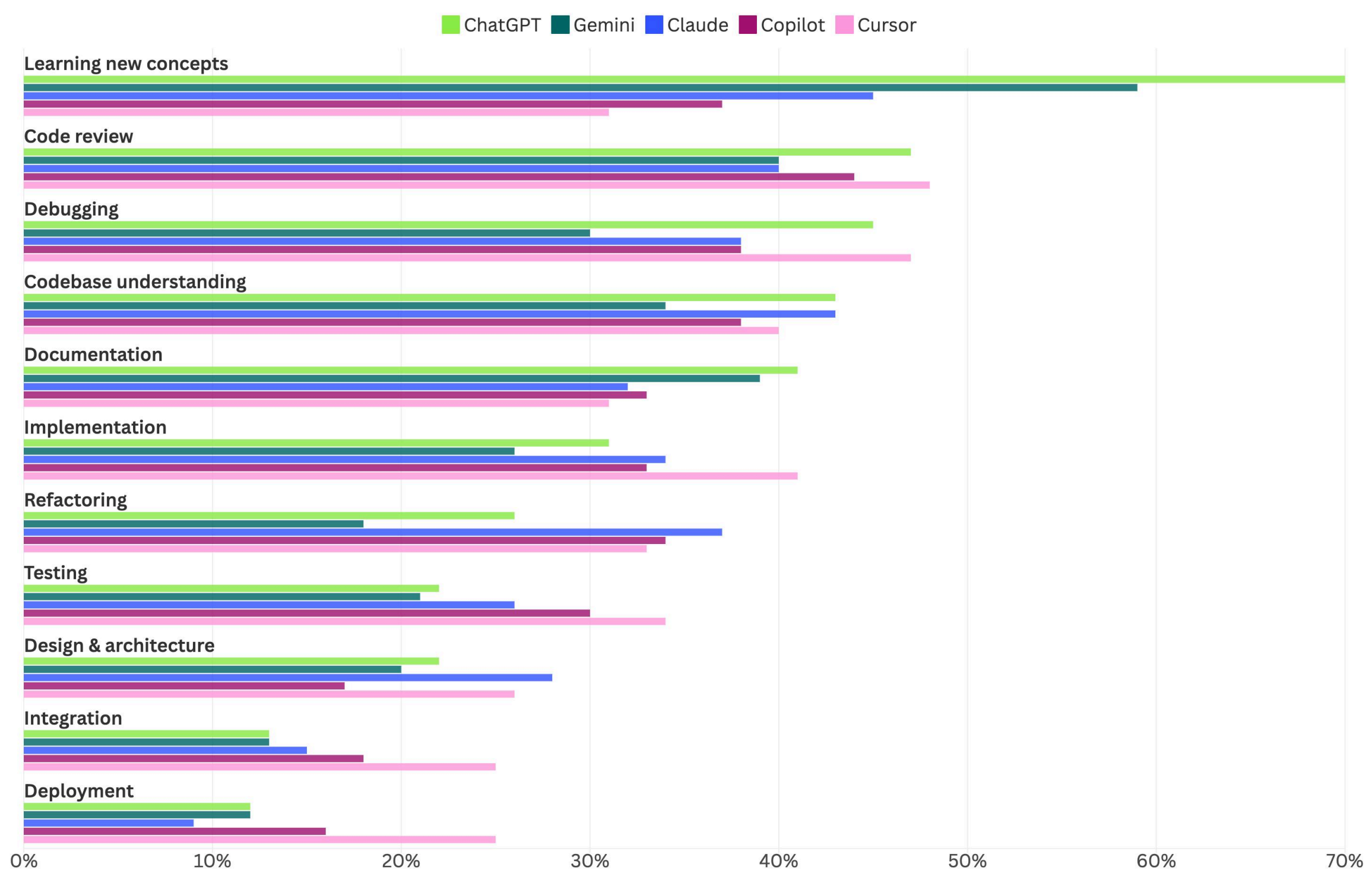
Developers use AI for a wide range of tasks, but four stand out: learning new concepts, code review, debugging, and codebase understanding.

ChatGPT leads across most tasks, but especially in learning—70% of its users turn to it for education, compared to 59% for Gemini, 45% for Claude and 37% for GitHub Copilot.

That said, not all tools are used the same way.

- Developers favor GitHub Copilot (41%) and Claude (34%) for refactoring over ChatGPT (26%)
- Cursor stands out for testing (34%), integration (25%), and deployment (25%).

## How developers are using different AI tools



Source: HackerRank Developer Skills Survey

# Developers don't doubt AI—just the hype around it

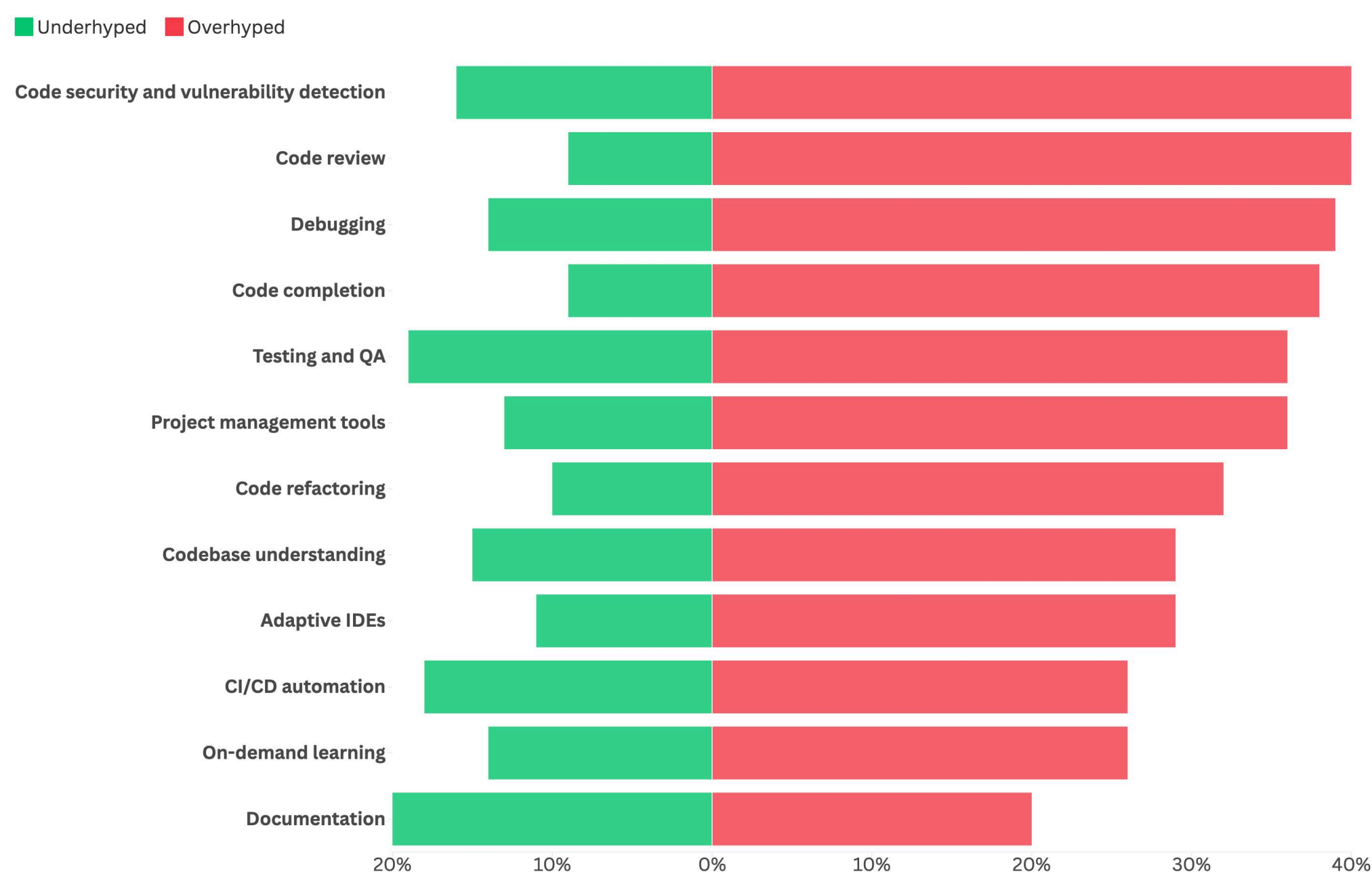
Several of the most common AI use cases—code review, code completion, and debugging—also top the list of tasks developers call overhyped. Not because AI can't do them, but because the hype machine oversells what it can actually deliver.

Hands-on experience makes developers both AI's biggest users and its sharpest critics. They've seen AI do things skeptics say it can't, but they also know where it breaks—where models stumble, generate nonsense, or require more oversight than promised.

That skepticism extends beyond coding. Developers see most AI use cases as overhyped—except documentation, where AI seems to provide more straightforward value.

When you work with AI every day, it's easy to roll your eyes at the grand claims. Developers know AI's strengths—they just don't buy the hype.

## Developers say most AI use cases are overhyped



Source: HackerRank Developer Skills Survey



## Insight #4

# Developers are taking control of their learning, because they have to

**Companies struggle to provide upskilling.** Time, budget, and leadership buy-in are major blockers.

**AI is reshaping learning.** Developers use it for personalized, just-in-time knowledge.

**Developers are choosing their own learning paths.** Back-end, ML, and front-end skills lead the way.

**Expectations may be rising faster than productivity.** They're using it, they know its strengths, but they also know the hype can go too far.

# Businesses face major barriers to internal mobility

Developers want career growth, but many companies aren’t delivering. More than 80% of engineering managers say internal mobility is blocked by unclear career paths, lack of leadership support, and gaps in training. Even when developers are ready for the next step, companies struggle to measure readiness, and managers hesitate to move top talent for fear of disrupting teams.

Without defined growth paths and real investment in mobility, developers will take their careers into their own hands—and likely to another company.


# Lack of upskilling isn't an oversight—it's an investment issue

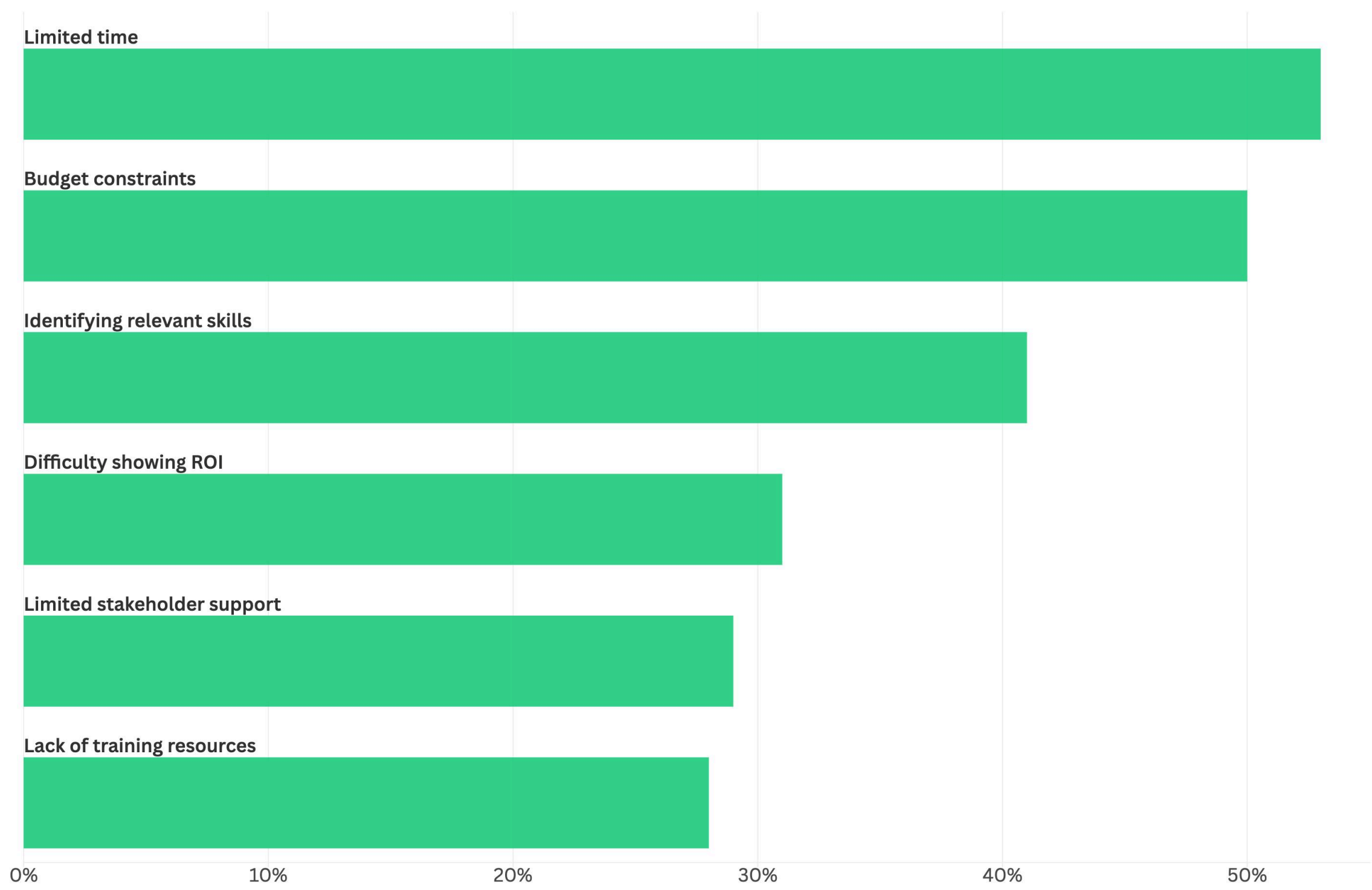
Companies say they want developers to keep up with new technologies, but many aren't putting in the time or money to make it happen.

More than anything, companies struggle to dedicate time for training—teams are stretched thin, and upskilling takes a backseat to immediate project demands. Budget is the second-biggest hurdle, with many organizations hesitant to invest in training despite the long-term payoff.

Even when companies do invest, another issue arises: identifying relevant skills. With tech evolving rapidly, figuring out what to train for—and proving ROI—becomes its own challenge.

The result? Developers who want to stay ahead are left to figure it out on their own.

## Top challenges to supporting tech training

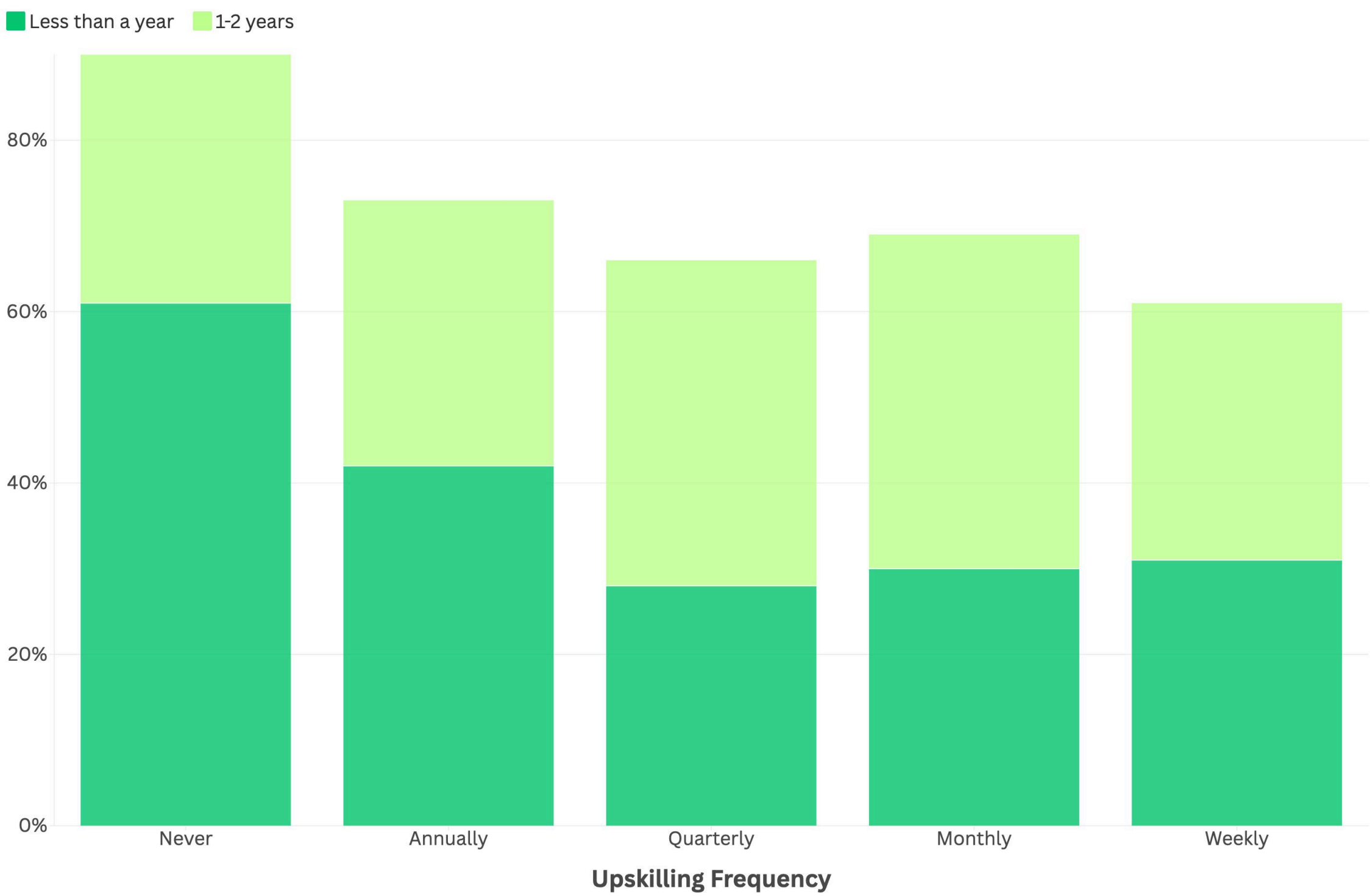


Source: HackerRank Developer Skills Survey

# 61% of developers without learning opportunities plan to leave

1 in 4 developers say they never get learning opportunities at work. And when that investment is absent, so are they—61% of those developers plan to leave within a year, and 90% within two years.

## How long do you plan to stay at your current company?



Source: HackerRank Developer Skills Survey

# Developers are choosing their own learning paths

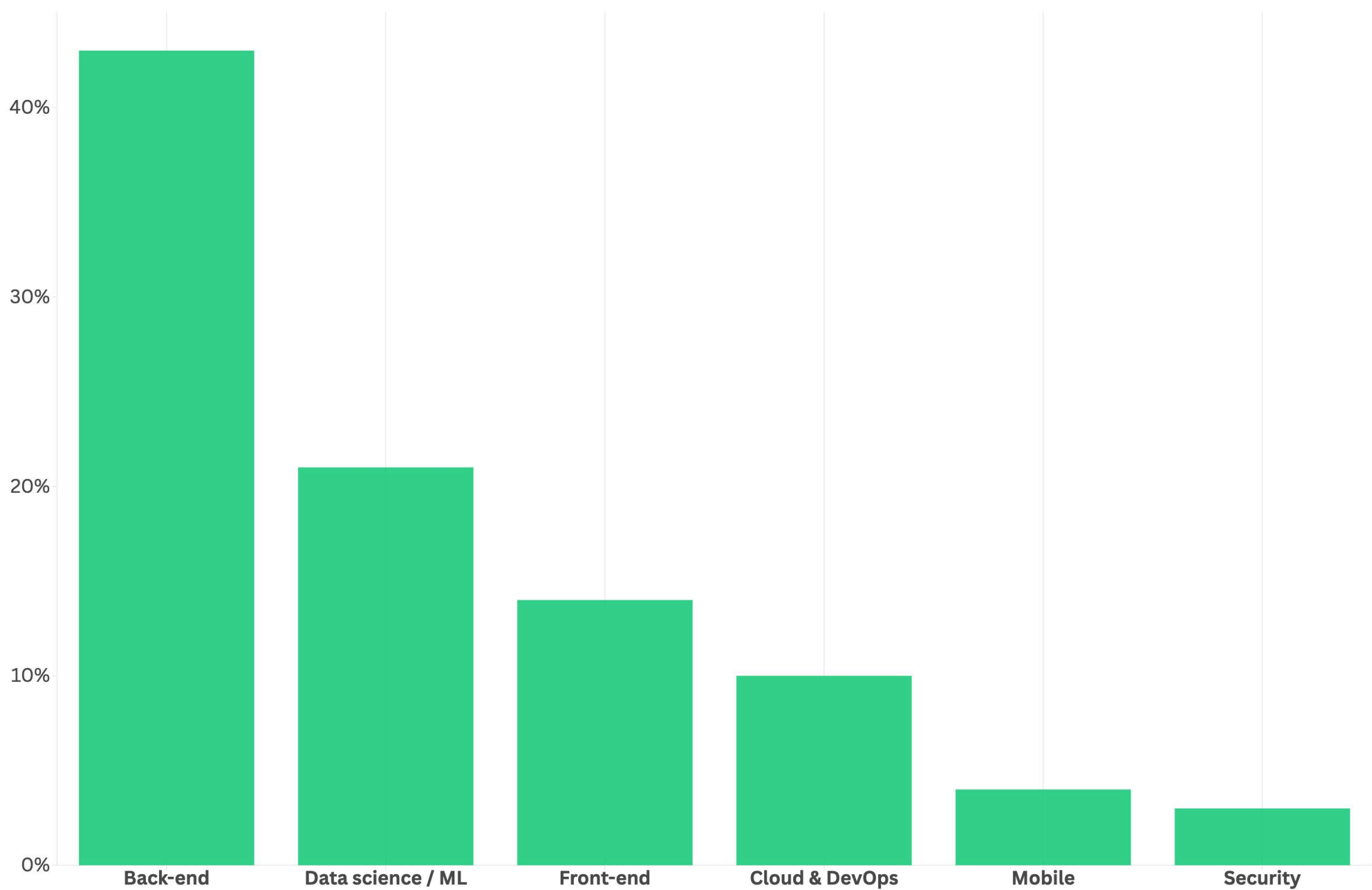
In 2025, developers’ focus is clear: back-end development, data science/machine learning, and front-end development.

Within those domains, the top priorities are:

- **Back-end:** Spring Boot, Node.js, and .NET
- **Front-end:** React
- **Data Science & Machine Learning:** ML development, LLM and AI APIs, and data engineering

Developers are making deliberate choices about their learning, focusing on skills that open doors and keep them competitive.

## Which skill domain are you most focused on in 2025?

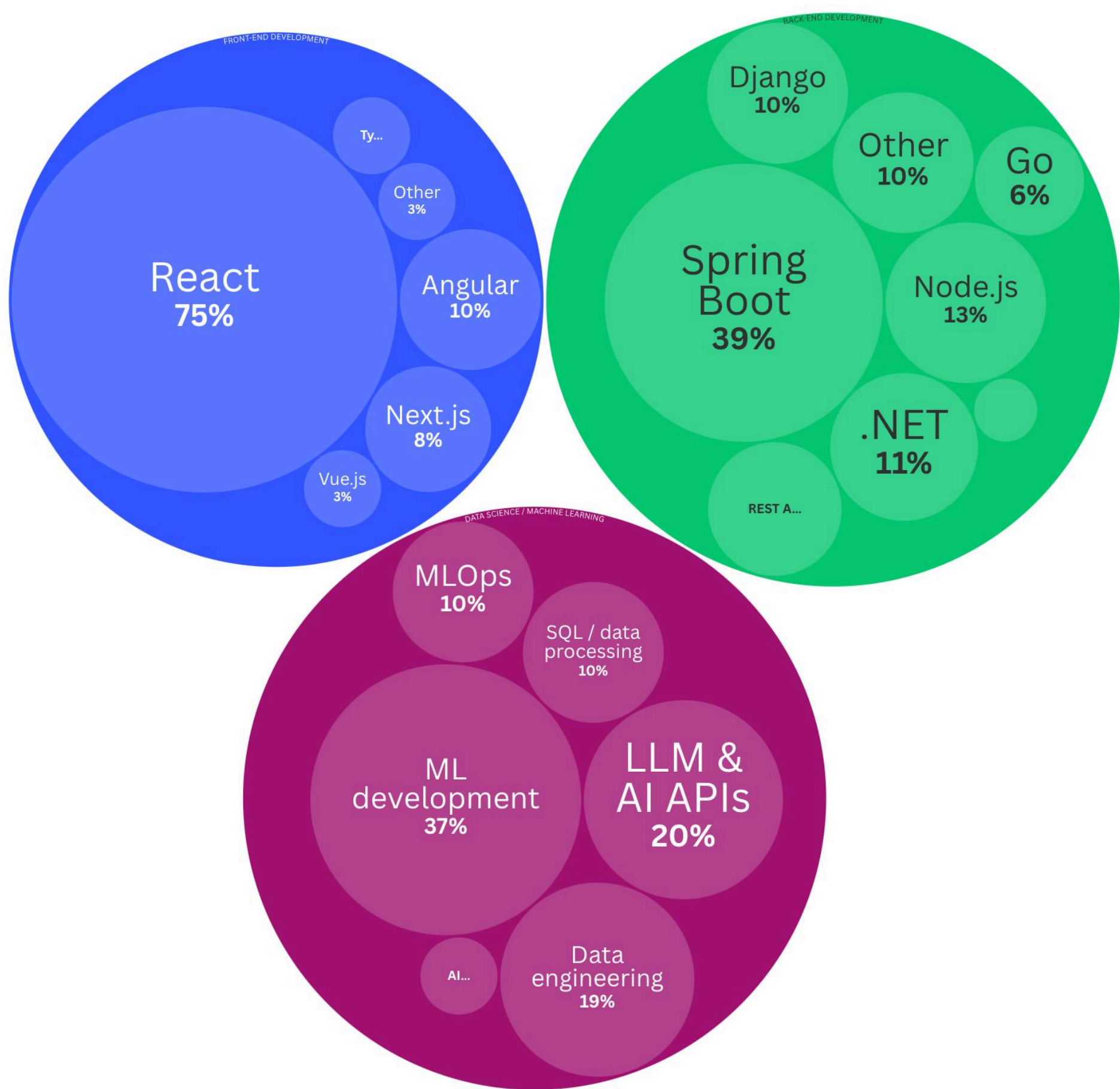


Source: HackerRank Developer Skills Survey

# Skill priorities within each domain

## All skill domains

Back-end development   Front-end development   Data science / machine learning



Source: HackerRank Developer Skills Survey



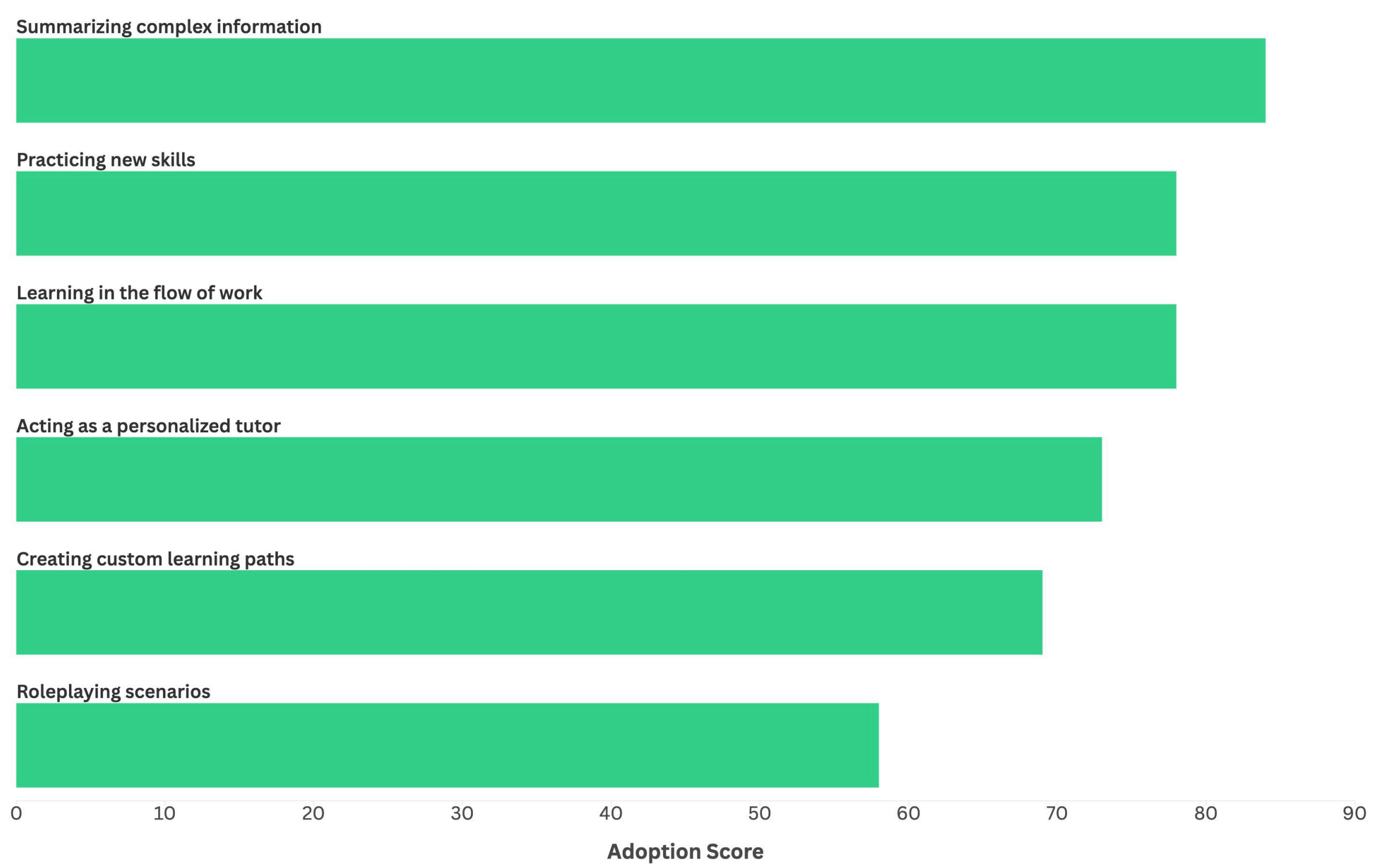
# AI isn't just filling gaps, it's redefining how developers upskill

Developers are using AI to reshape how they gain new skills. 70% of ChatGPT users rely on it to learn new concepts, a trend that carries across other chat-based LLMs. These tools have become a go-to resource for fast, adaptable learning, offering instant explanations, examples, and coding support.

Summarizing complex topics is the most common way developers use AI to learn, followed by practicing new skills, learning in the flow of work, and using AI as a personalized tutor. AI isn't just answering questions—it's helping developers test their understanding, refine their approach, and gain hands-on experience faster.

Beyond immediate learning, developers are creating custom learning paths and even experimenting with roleplaying scenarios to simulate real-world problem-solving. The result? A shift away from passive learning toward adaptive, skill-based, and workflow-integrated models that developers control.

## How developers use AI to learn



Source: HackerRank Developer Skills Survey

# The learning gap is closing— with or without companies

If companies don’t provide learning opportunities, developers will find their own way. With AI, personalized, contextualized learning is more accessible than ever—allowing developers to upskill on their terms, at their pace. And when growth isn’t an option? Developers will leave. Whether it’s for a company that invests in them or an industry that offers better opportunities, learning is directly tied to retention.

At the same time, AI is reshaping how learning happens. Its ability to deliver just-in-time knowledge could make upskilling more adaptable within the realities of time and budget constraints. Whether companies take advantage of that remains to be seen.


## Insight #5

# Developers feel the gap between hiring tests and real-world skills is still too wide

**Developers want to prove real-world skills**, but many assessments still prioritize theory over practical coding.

**62% of developers feel forced to overprepare** on algorithm-heavy assessments that don't reflect real work.

**AI has changed how developers approach assessments.** 76% say AI makes gaming the system easier.

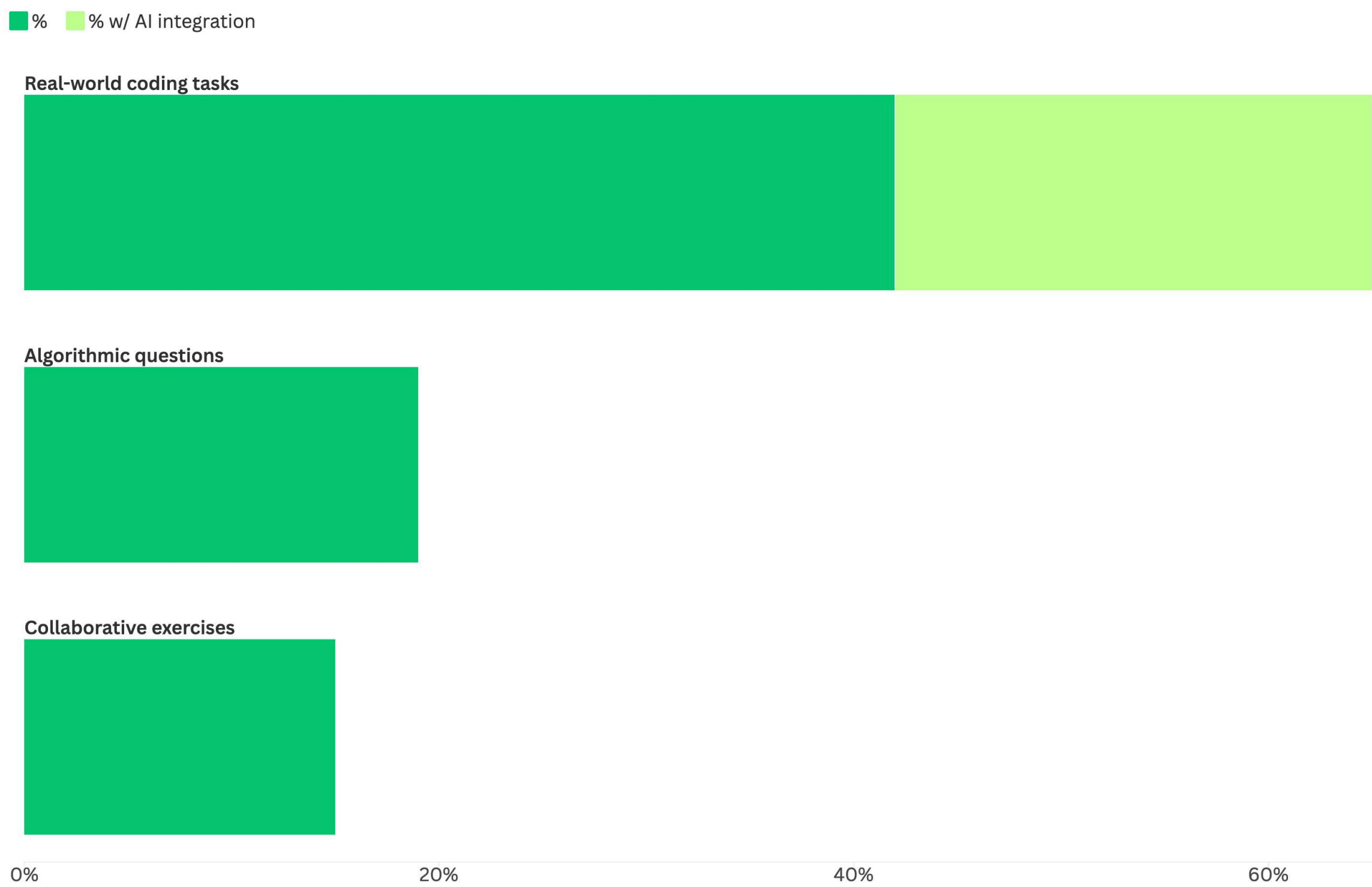
**Fairness concerns are common.** 73% of developers feel it's unfair to lose out to candidates who use AI to game tests.

# Two thirds of developers want assessments built around real-world tasks

Developers overwhelmingly prefer practical coding challenges over theoretical tests—66% say they’d rather be evaluated on real-world skills, and 96% believe problem-solving should matter more than memorization.

Yet, most hiring tests don’t reflect the actual work. 78% of developers say assessments don’t align with real-world tasks, and 56% find algorithm-based questions irrelevant to their jobs. Instead of demonstrating how they solve problems, candidates feel forced to grind leetcode and overprepare on concepts they rarely use.

## Developers' preferred assessment formats

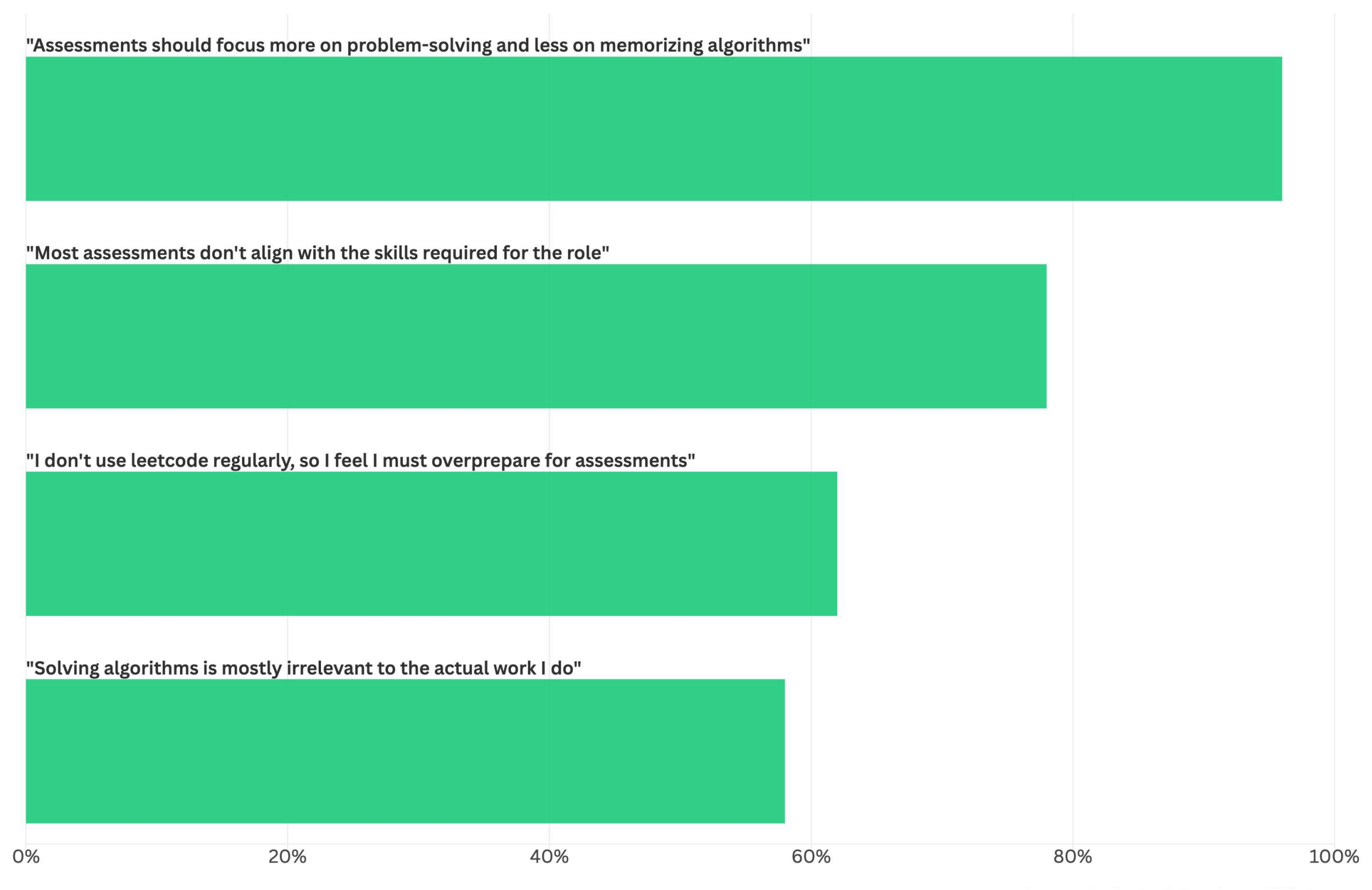


Source: HackerRank Developer Skills Survey

Tech leaders recognize the gap—ensuring assessments are relevant ranks as their top concern, even above bias prevention and assessment integrity. But despite this awareness, outdated tests persist, making it harder to identify the right talent.

As AI reshapes software development, hiring assessments need to evolve with it. The challenge isn’t just measuring coding ability—it’s understanding how developers think, debug, and build in real-world environments. Companies that bridge this gap won’t just improve hiring outcomes; they’ll create a process that better reflects the work itself.

### Developer sentiments toward assessments



Source: HackerRank Developer Skills Survey

Insight #6

# Attracting developers starts well before the job post

**Hiring is a two-way street.** 78% of tech leaders struggle to find candidates, just as 74% of developers struggle to land jobs.

**Tech brand visibility matters.** Developers look at open-source contributions, community engagement, and hackathons.

**In-office requirements are a dealbreaker.** 79% prefer hybrid or remote work.



# Finding a job is hard—but so is finding the right candidate

74% of developers say landing a tech job is difficult. But on the other side, 78% of tech leaders say finding skilled candidates is just as hard. And 72% cite hiring competition as a major challenge—ranking just behind the struggle to find qualified talent.

Developers struggle to get hired, but hiring teams face their own challenges. The disconnect isn't just about demand—it's about how hiring happens.

- **Applications are broken:** AI-generated resumes flood the pipeline, making it harder to separate strong candidates from noise. But filtering solutions often create false negatives, shutting out qualified developers. Companies need better ways to surface real talent without relying on rigid screening rules.
- **Hiring is a budget game:** Finding great developers isn't just about competition—it's about who can afford to hire. Many teams face headcount freezes or shifting priorities, making it difficult to plan effectively.
- **Processes aren't slow by design.** Long hiring cycles aren't intentional—they're often the result of understaffed teams, legacy processes, and shifting internal priorities. Many companies struggle to balance speed with thoroughness, leading to delays that leave everyone frustrated.
- **Tests aren't always measuring real skills.** Leetcode-style assessments measure theory, not real-world coding ability. They leave both developers and hiring teams uncertain whether a candidate can actually do the job—especially as AI makes it easier to game the system.
- **The right candidates aren't always applying.** Developers have more options than ever, and many strong candidates never enter the pipeline. Whether it's a lack of employer visibility, unclear job descriptions, or talent opting out of lengthy hiring processes, companies often struggle to attract the right developers in the first place.
- **Tech hiring is reactive when it needs to be strategic.** Many companies hire in response to urgent needs rather than long-term planning. This leads to rushed decisions, mismatched expectations, and cycles of hiring and layoffs that create instability for both companies and candidates.

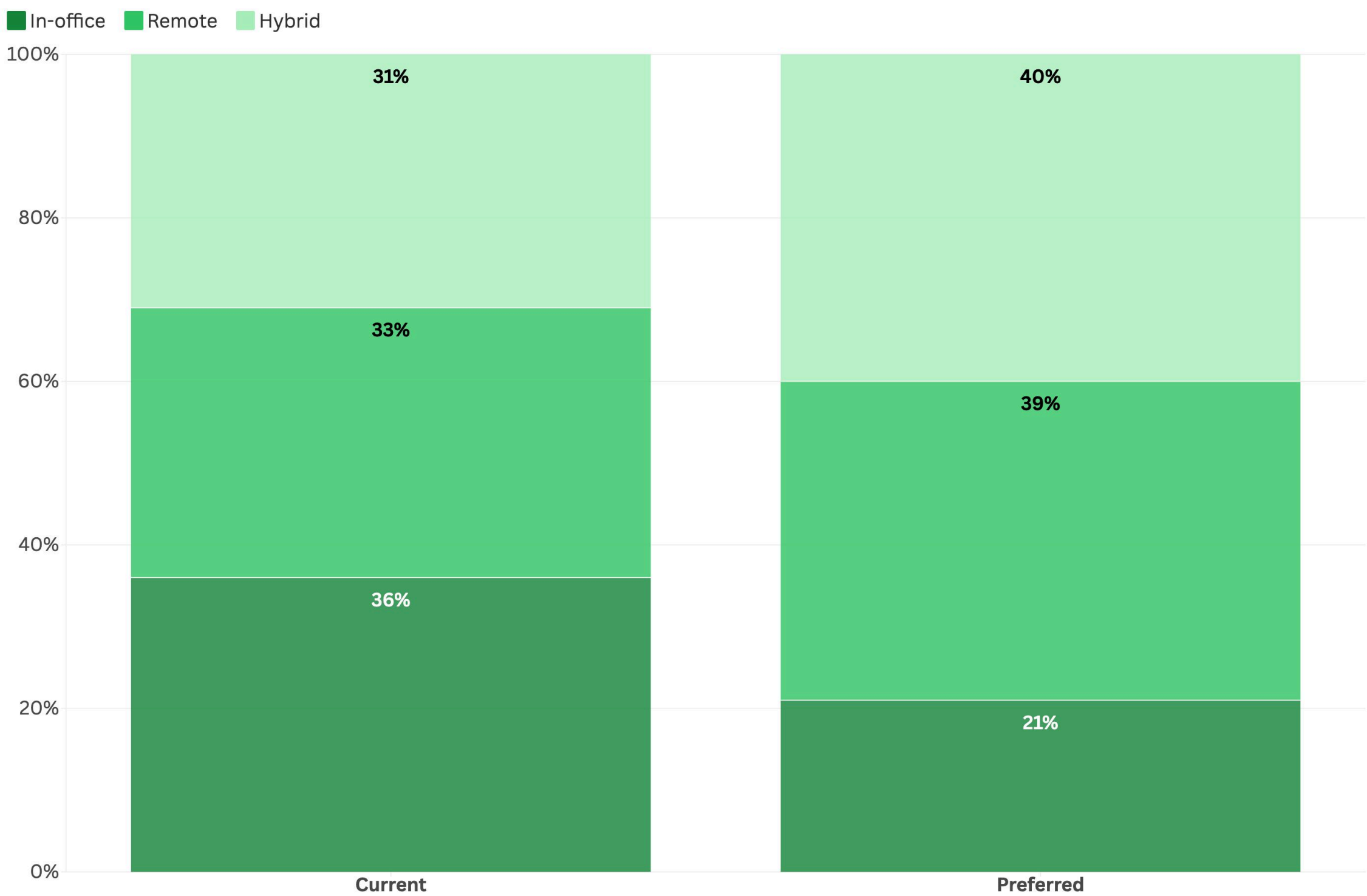
# Developers strongly prefer hybrid or remote work

79% of developers prefer hybrid or remote work.

There’s some regional variation—developers in India are more open to in-office work (26%), but still prefer hybrid or remote. Across the rest of the Asia-Pacific region, only 15% prefer in-office. And in the U.S.? Just 10%.

For most developers, return-to-office policies aren’t a perk—they’re a dealbreaker.

## 4 out of 5 developers prefer hybrid or remote work locations



Source: HackerRank Developer Skills Survey

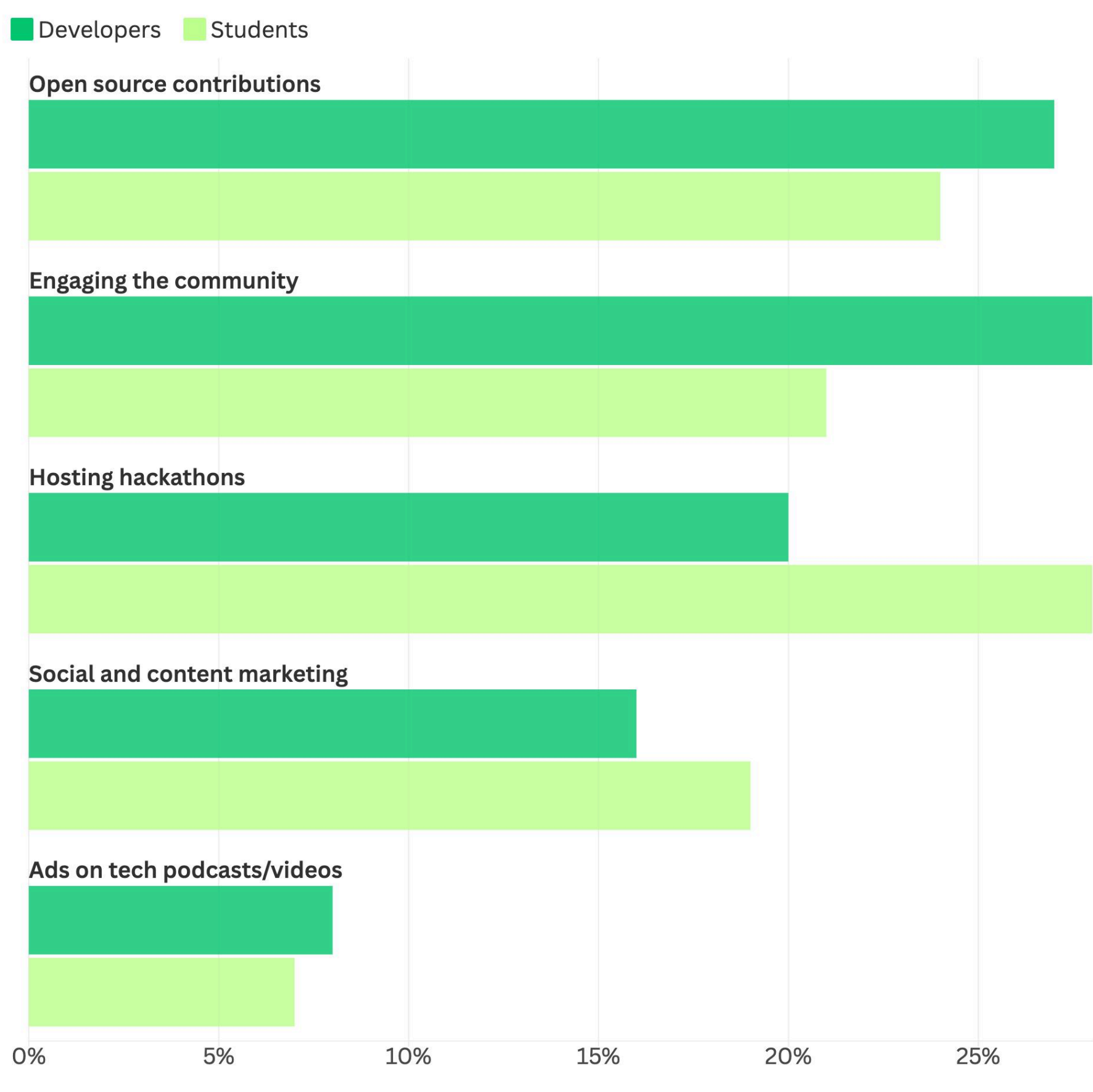
# When it comes to your tech brand, show, don't tell

If your company isn't widely known for its tech, visibility isn't just a branding play—it's a hiring advantage. The best developers want to work where innovation is happening, and the companies that attract them show, rather than tell.

The most effective ways to build credibility? Engaging directly with the developer community, contributing to open-source projects, and hosting hackathons.

That's not to say traditional employer branding—ads, content marketing, social campaigns—doesn't matter. It does! But if you want developers to see you as a great place to work, start by being an active part of their world.

## What's the best way for a company to showcase its tech brand?



**Pro tip:** Looking to hire university talent? Student developers say the best way for a company to showcase its tech brand is to host hackathons (28%).

Source: HackerRank Developer Skills Survey

# Conclusion

AI is already transforming software development, and we're still in the early stages. The role of a developer isn't disappearing, but it is evolving—just as it has with past technological shifts. As we race toward a future that's human + AI, companies must rethink how they attract, hire, and upskill talent.

The hiring process that's been stitched together over time is straining under the mass adoption of AI and the realities of the 2025 job market. Solutions that were “good enough” even two years ago no longer are. Developers are already adapting to this changing world, and companies need to as well. Those that don't will struggle to hire and retain top talent.

## Here's what needs to change:

**Attracting developers starts before the job post.** The best candidates don't just apply—they engage. Companies that contribute to open source, support developer communities, and host hackathons stand out by giving developers something to engage with.

**Hiring must focus on the right skills—and the right way to evaluate them.** Companies need to be deliberate about what they're testing and how. Assessments should reflect the actual job, not just what's easiest to measure. If developers could fix one thing about hiring, it would be replacing algorithm-heavy tests with real-world projects that show how they solve problems in practice.

**AI is reshaping how developers learn, but its role in company-driven upskilling is just beginning.** AI enables more flexible, personalized learning, but companies need to connect it to measurable outcomes. Using AI-driven learning alongside assessments, certifications, and structured skill development will create stronger, more skilled teams.

Developers are already adapting. The companies that evolve with them—the ones that rethink hiring, invest in learning, and build real developer engagement—will be the ones that win in 2025.

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