The 2024 China Developer Survey Report is here! Monthly salaries are centered between 8k and 17k, nearly 60% of people have not changed jobs in a year, and AI can reduce workload by 20-40%.

*Note: These are Jeffrey Ding's informal and unofficial translations -- all credit for the original goes to the authors and the original text linked below. These are informal translations and all credit for the original work goes to the authors. Others are welcome to share **excerpts** from these translations as long as my original translation is cited. Commenters should be aware that the Google Doc is also publicly shareable by link. These translations are part of the ChinAI newsletter - weekly-updated library of translations from Chinese thinkers on AI-related issues: https://chinai.substack.com/*

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In the past year, intelligent-ization has "swept across" all major technology fields. There are amazing things, such as the flourishing AI chatbots that have become small encyclopedias, which can answer questions, help with coding, and even provide various ideas for entrepreneurship; it is no longer a dream to produce a video in a few seconds or compose a song with one click. Sora, Suno and other large models are "all-around killers"... With the help of AI assistants, people and, especially individual developers, can do more and more innovative projects on their own.

Of course, there are also anxiety-provoking ones, such as:
- With the large-scale promotion of Baidu's self-driving taxi Apollo Go in Wuhan, some people asked the soul-searching question, "What will the 10 million drivers do?"
- The mother of ChatGPT, OpenAI CTO Mira Murati said that AI automation will replace humans, and creative work may disappear...

In an era when new technologies are constantly impacting traditional industries, what kind of impacts and challenges are faced by developers fighting on the front line?

In March this year, CSDN and *New Programmer* [新程序员] launched an in-depth questionnaire on the current status of developers, artificial intelligence, and open source, which eventually formed a detailed "2024 China Developer Survey Report".

This report not only reveals the real situation of Chinese developers in work, study, and life, but also deeply explores the latest developments in generative AI tools and open source applications. The insights and data in

the report provide valuable references for developers and companies, hoping to help everyone better understand technology trends and market demands, so as to remain unbeatable in this fierce competition.

1. Important findings

According to the survey report, we have the following important findings:
- 58% of developers seek to become managers in the next 1-5 years;
- People with a monthly salary of 8k-17k account for the highest proportion, accounting for 36%;
- 58% of developers have not changed jobs in the past year, and 38% of people have changed jobs once or more. Dissatisfaction with salary and benefits is the primary reason that developers change jobs;
- Although Python is not as good as Java in some aspects, it has a wide range of applications in data science and artificial intelligence, accounting for 35% (in terms of percent of developers surveyed on their use of programming languages);
- Frequent meetings, distracting work environments, and lack of sufficient staff to share work, etc. are the main factors leading to low developer efficiency;
- There is a lot of talk about "leaving the cloud" abroad, but it has not formed a trend in China;
- ChatGPT is far ahead of other competitors with a market share of 56%, becoming the most popular AI chatbot, and Tongyi Lingma is the most commonly used AI coding assistance tool for developers;
- More than 90% of developers gave 5 points or more to the existing AI tools in the industry (10 points is the full score), 38% of developers think AI coding assistance tools can save 20%-40% of workload;
- 75% of developers support open-source large models;
- Developers' focus on open source technology is mainly on open source AI, open source big data and open source cloud native technology.

2. The real portrait of programmers: Age anxiety has eased slightly, with 8k-17k as the highest proportion of monthly salary, and 60% hope to be promoted to management positions

R&D positions pay more and more attention to an individual's technical skills, problem-solving ability and innovative thinking, which is reflected in the report.

According to the survey report, the overall situation has improved for the "job that relies on youth" and age-related issues that developers are concerned about. This year, practitioners under the age of 30 are still the main force, accounting for 72%. Practitioners over 30 years old are almost the same as last year, but compared with previous years, the proportion of developers over 40 years old has increased significantly.

Overall, the software industry covers nearly half of the domestic developers, and the proportion of back-end development is the highest.

However, compared with 2023, the number of developers in first-tier cities has decreased compared with previous years. Last year, the number of practitioners under the age of 30 in first-tier cities reached 41%, while this year it was only 31%.
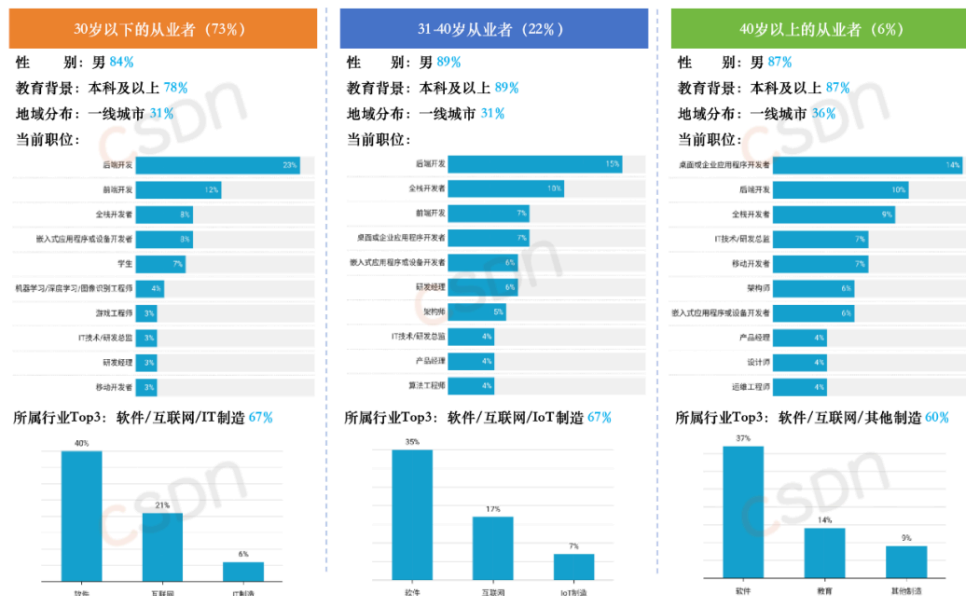
Basic characteristics of developers

In the career development plan of developers, 44% of the respondents said they would continue to work in technical positions until retirement. Under this trend, it can be estimated that the proportion of developers over 30 years old will also increase in the future.

As they grow older, their skills improve, and their horizons broaden, 58% of developers have the desire to become managers. Of course, this position can provide higher salaries and better career development opportunities. 43% of respondents said they were willing to work hard for this and planned to become managers in the next 3-5 years.

Nearly 60% of developers have not changed jobs in the past year, and the proportion of people with a monthly salary between 8k-17k is the highest.

In the past year, the global technology industry has ushered in a "layoff wave", and many technology giants such as Alphabet, Amazon, Meta, Microsoft, eBay and other companies have announced large-scale layoffs. According to data from Layoffs.fyi, about 32,000 people in the technology industry lost their jobs from the beginning of 2024 to February. This has aroused the vigilance of many people, and between working and leaving or changing jobs, they have chosen to be relatively stable.

Data shows that 58% of developers have not changed jobs in the past year. The proportion of people who have changed jobs once or more is 38%.

When it comes to their reasons for changing jobs, 60% of the respondents said that it was mainly because of dissatisfaction with the salary and benefits. Secondly, limited personal development and complex interpersonal relationships in the company are also important factors affecting developers' job changes, accounting for 51% and 21% respectively.

Regarding the issue of dissatisfaction with salary and benefits, 41% of developers revealed that their salary has not changed in the past year, and 10% of developers have experienced negative growth. 49% of developers said that their salary has increased in the past year, while the figure was 51% in 2023 and 62% in 2022.
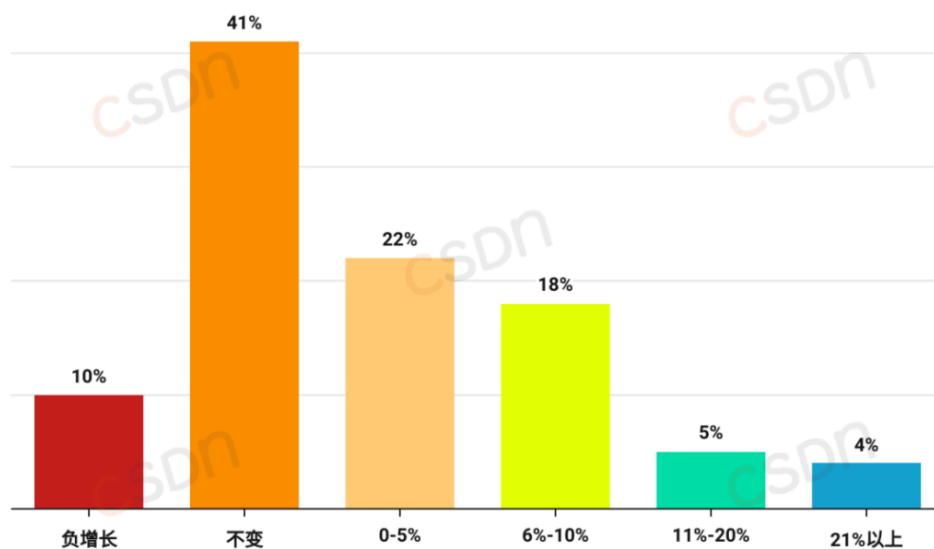
Monthly salary growth situation of developers

Data shows that the salary level of most developers is concentrated between 8001-17000 RMB, accounting for 36%. The proportion of developers with salary levels below 5,000 RMB and between 5,001 and 8,000 RMB is 15% and 15% respectively, and the overall proportion of this range is basically the same as last year.

It is worth noting that the proportion of developers with a monthly income of more than 17,000 RMB has increased from 27.7% last year to 34%. Analyzing the reasons behind this, the AI industry, which requires higher job skills, has promoted the increase in developer income to a certain extent.
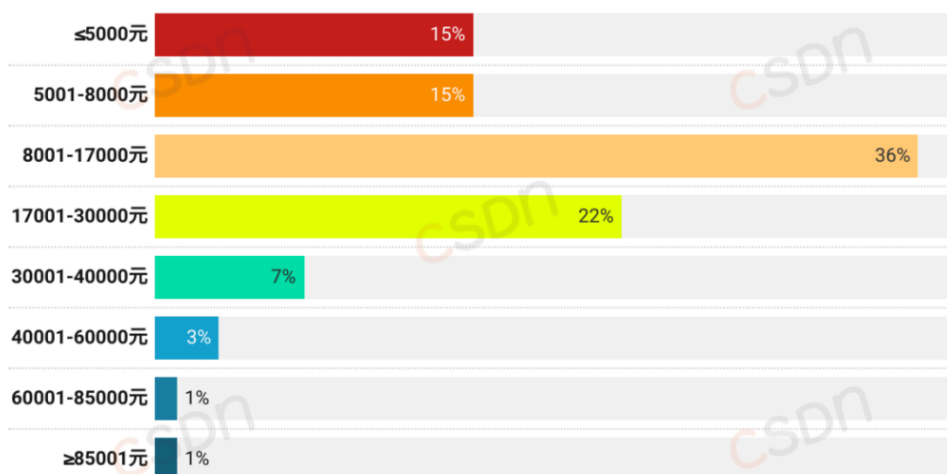
Distribution of monthly salaries of developers

In addition, it is not only the overall economic environment and the industry that affect salaries, but also the city where the developer is located, education, working hours, etc. will cause salary fluctuations.

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There are more high-paid people in first-tier cities. The survey shows that Beijing and Guangdong are regions with a large number of developers, accounting for 27% of the national total. The proportion of developers in Jiangsu and Shanghai is in the second echelon, accounting for 14% of the national total. Compared with last year, the distribution of developers in these regions has declined.
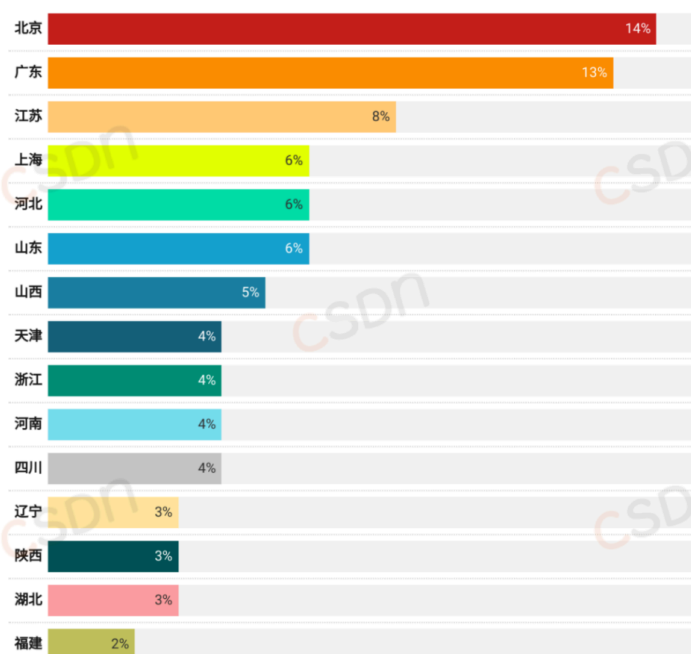

Developers by Top 15 regions (provinces, autonomous regions, centrally-administered municipalities, special administrative regions)

Among developers with a monthly salary of more than 17,000 RMB, 20% work in Beijing, which has decreased compared to last year, but is still far higher than other regions. The proportion of developers with a monthly salary of more than 17,000 RMB in Guangdong, Hebei, and Jiangsu is 10%, 9%, and 9% respectively.

Nearly 60% of master's graduates and doctoral graduates have a salary of more than 17,000 RMB.

Education level is also an important factor affecting salary levels. According to the data, among developers with high levels of education, the proportion of them in high-income groups is relatively high. Among developers with a master's degree or a doctoral degree, far more than 50% have a salary of more than 17,000 RMB.
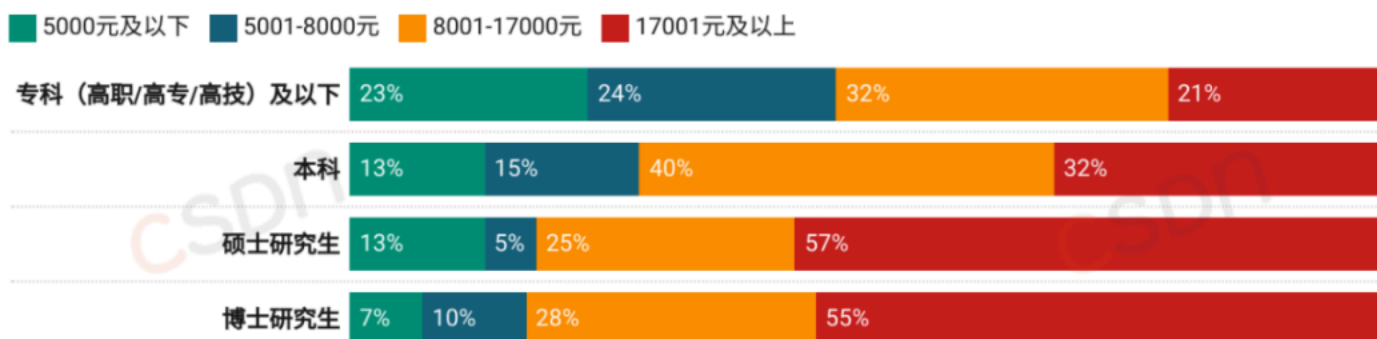
Salary distribution of developers with different educational backgrounds

Working hours (per week) are also one of the important factors affecting income. Data shows that among developers with working hours of more than 72 hours but less than 84 hours, the proportion of those with an income of more than 17,000 RMB is the highest, at 70%. For developers with more flexible working hours, 65% of them have a salary of 5,000 RMB or less.

This finding echoes the data from the "2024 Workplace Survival Insights" report recently released by Maimai Gaopin. The report pointed out that the new economy industry has great job-hunting pressure, the talent supply-demand ratio is as high as 1.97, and the average tenure of young people is short. Faced with reduced wages and benefits, people in the workplace have adopted different coping strategies, such as reflexively shortening working hours and controlling consumption.

Experience accumulation. Developers' wages will increase with the increase of their length of service. Among developers who have worked for 11 years or more, more than 60% of developers have a salary of more than 17,000 RMB. Among the respondents who have worked for 20 years or more, 69% of developers have a salary of more than 17,000 RMB.

In contrast, among developers who have worked for less than 1 year, only 15% have a salary of more than 17,000 RMB, and 37% of developers receive a salary of 5,000 RMB or less.

3. The primary reason why an average programmer's daytime efficiency is not as high as that at night is meetings.

At the beginning of this year, when Jason Wei, an OpenAI researcher, shared his daily schedule as an OpenAI technician on the X platform, he once again sparked a discussion about "involution": getting up at 9 o'clock, meeting at 10 o'clock, eating at 6 o'clock, going home at 7 o'clock to continue writing code and doing experiments until going to bed at 1:15 in the morning.
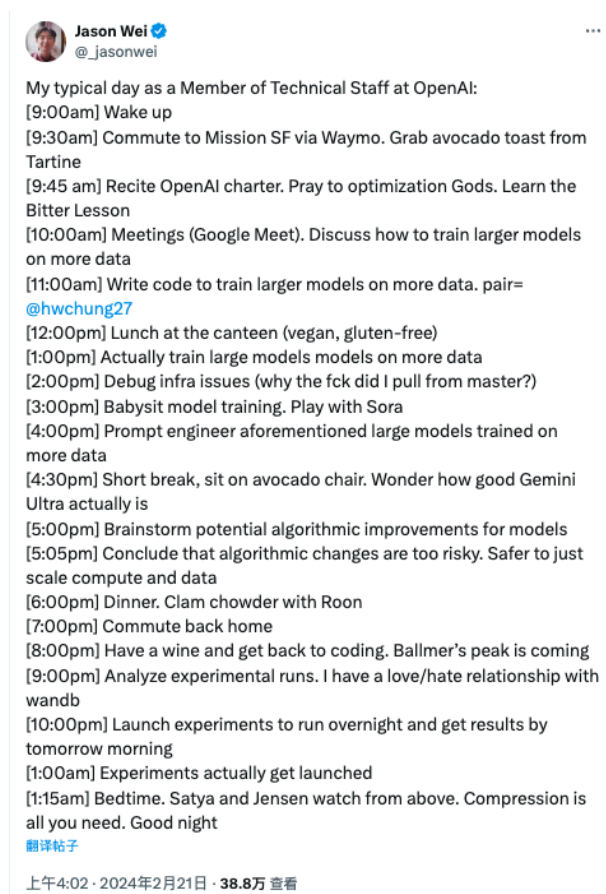
Some people have found that as a programmer, work efficiency during the day is far lower than that at night; some people also complain that at work, it is mainly because there are various things during the day that interrupt the work at hand, thus affecting work efficiency.

The survey data of this report shows that 32% of developers said that frequent meetings are really the "culprit" that affects work efficiency, which shows that more and more developers hate meetings. Secondly, factors such as a distracting work environment and a lack of enough people to share the work can cause developers to encounter difficulties or inefficiency in completing their work.

In daily work, programmers like OpenAI researcher Jason Wei are not writing code all the time. Only 7% of developers spend more than 70% of their time writing code every day. Nearly 80% (79%) of developers said that the time spent writing code every day is less than half of their overall working time. In other words, in addition to writing code, most developers need to perform other tasks and activities in their daily work, such as design, testing, communication, and document writing. This reflects that in modern software development, writing code is only part of the work, not all of it.
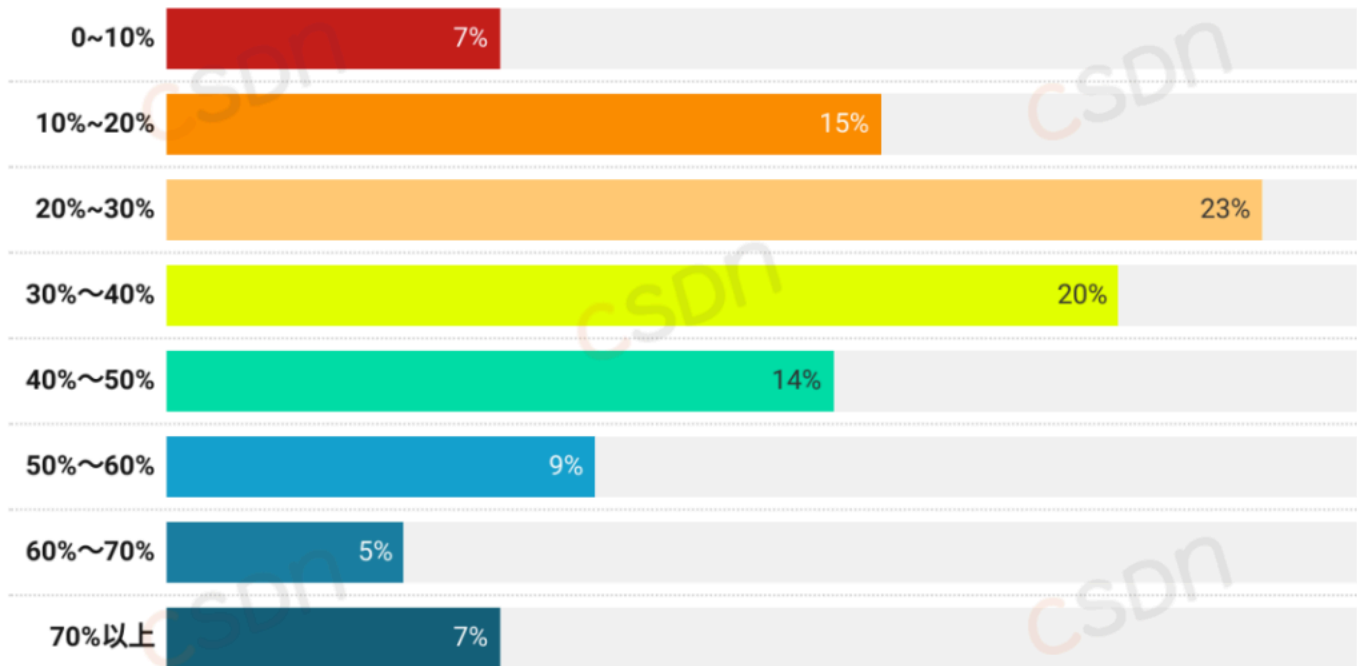
The amount of time developers spend writing code every day

However, some companies still use the number of lines of code as an indicator to measure the workload of developers. But in fact, data shows that 74% of developers have no more than 300 effective lines of code per day. The group of developers who write 101-200 lines a day accounts for the highest proportion, at 23%.
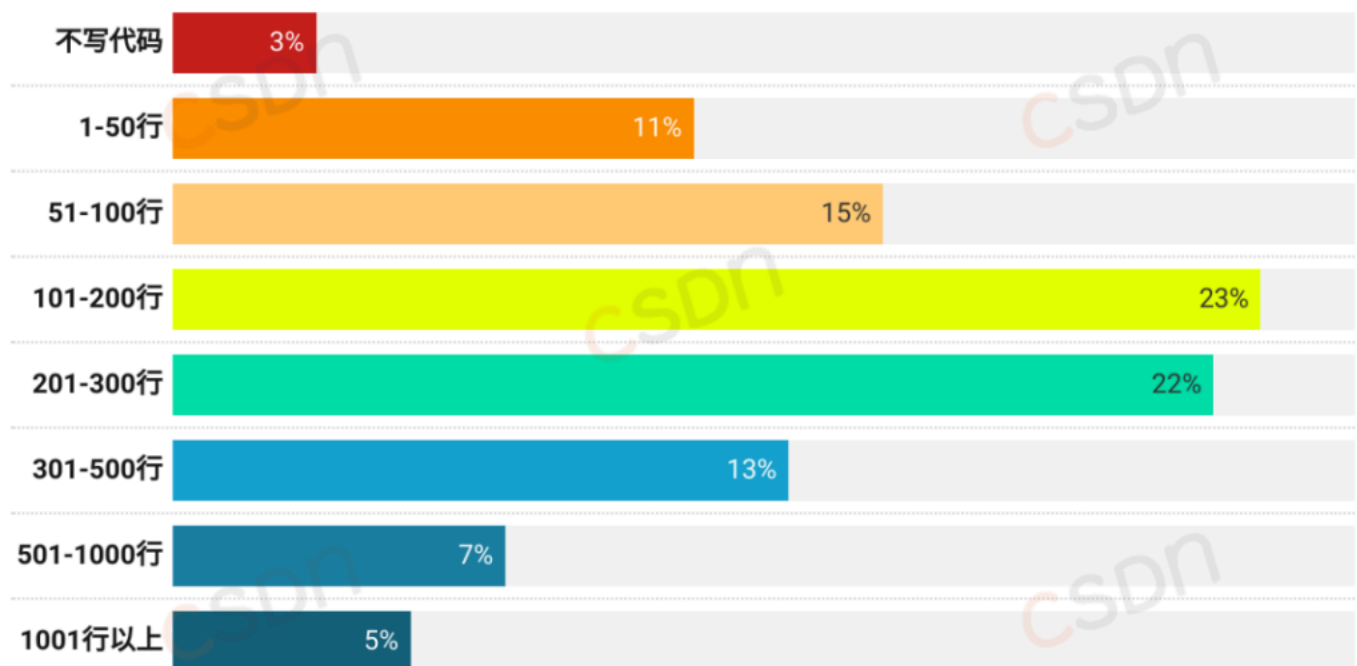
The number of lines of code written by developers every day

# 4. Java ranks first, and "leaving the cloud" has not formed a trend in China

If you want to do your work well, you must first sharpen your tools. In terms of the tools used by developers, in the field of programming languages, Java is still the most popular programming language, reaching 40% (in terms of percent of developers surveyed on their use of programming languages), which may be due to its stability and wide ecosystem support.

Although Python is not as good as Java in some aspects, it has a wide range of applications in data science and artificial intelligence, so it also has a high usage rate, accounting for 35%, an increase from last year's 31.2%. Looking at the explosion of AI in the past year, this is also within the range of expectations.

***Did not include a passage that reported developers' complaints about C-based languages (low-level assembly languages)*

In terms of operating systems, 63% of developers use Windows as the desktop operating system for daily development work. In addition, Linux surpassed macOS and became the second most commonly used development environment for developers, accounting for 19%.

In the use of mobile operating systems, the proportion of developers that use various types of mobile operating system platforms is relatively balanced. Among them, 20% of developers choose to use iOS, 20% of developers use Xiaomi Pengpai OS and MIUI, and 18% of developers use HarmonyOS.
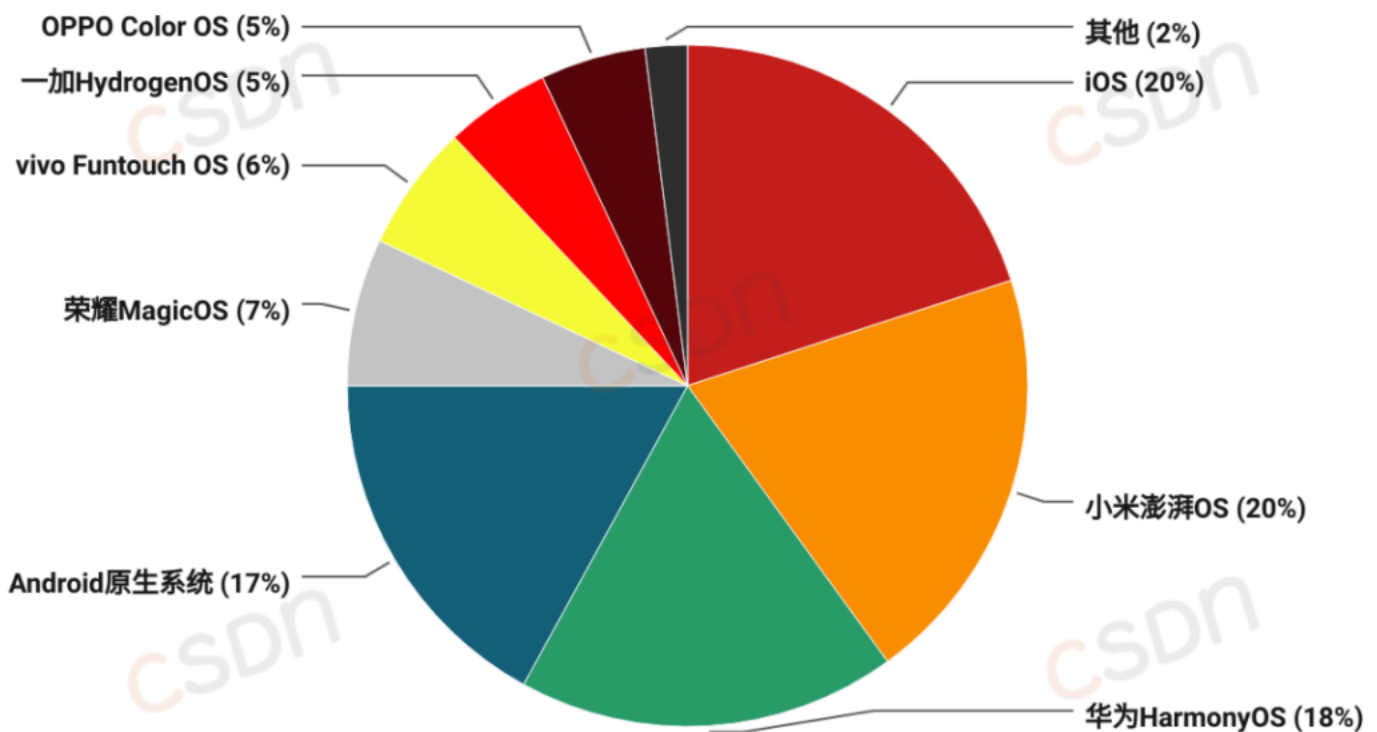

Ranking of mobile operating systems used by developers

MySQL is the most commonly used commercial database, accounting for 65%. In addition, Redis and Oracle are also used at a relatively high rate, accounting for 25% and 23% respectively.

In terms of tool frameworks, Vue.js has attracted many developers with its easy-to-learn and easy-to-use features. It provides a progressive approach to building user interfaces, making the development process more efficient and flexible. It has become the most popular web framework with a usage rate of 30%. Spring Boot and Node.js are second, accounting for 20% and 18% respectively.

IntelliJ IDEA and Visual Studio Code rank first and second with usage rates of 39% and 33% respectively. Both IDEs are powerful development environments that are suitable for multiple languages and have a wide range of plug-in ecosystems. Their success is due to their rich feature sets and good user experience, which can meet different types of development needs.
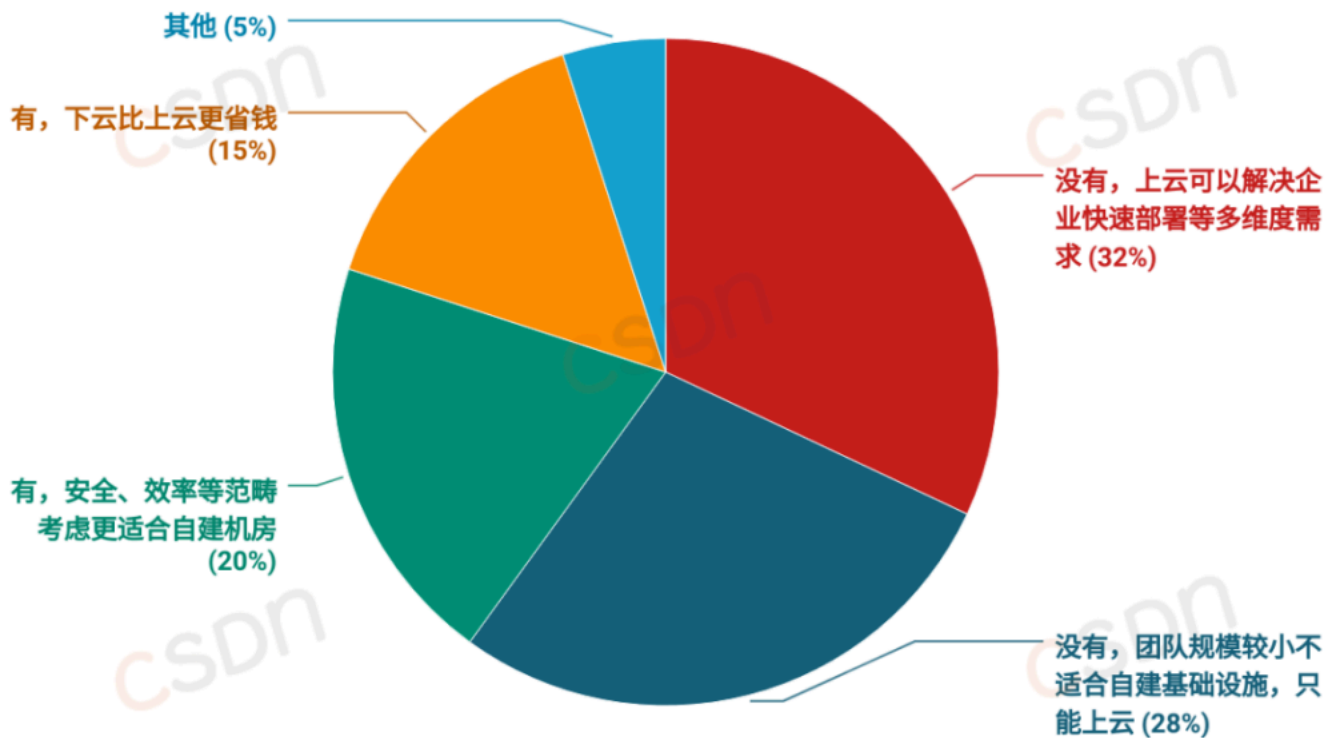
The main domestic cloud platforms include Alibaba Cloud, Huawei Cloud, Tencent Cloud, Baidu Cloud, etc. In terms of the use of container cloud platforms, Alibaba Cloud is in the leading position, with 29% of developers using Alibaba Cloud. 17% of developers also said that they use self-built container cloud platforms.
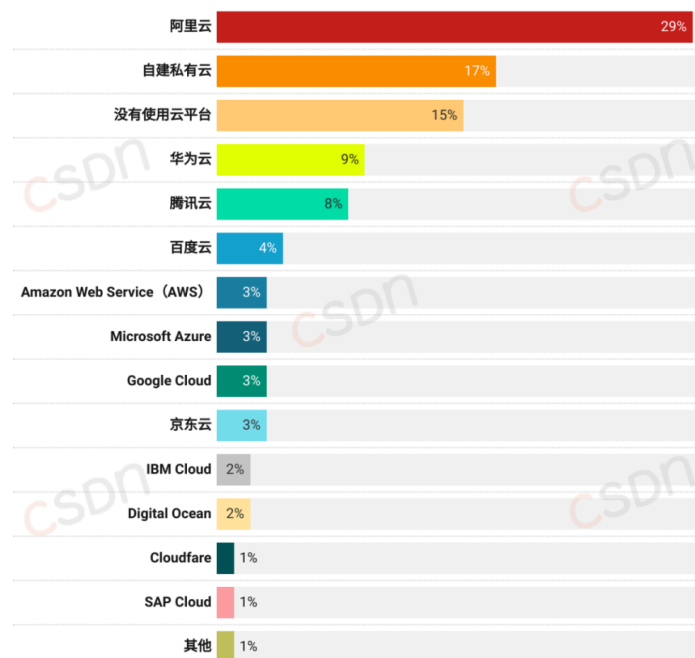
Ranking of cloud platforms mainly used by developers

In the past year, many foreign companies have voiced their intention to "go off the cloud," claiming that the cost of going to the cloud is too high, and some have even built their own servers to reduce costs. However, in China, more than half of the respondents said they had no experience of "going off the cloud," of which 32% believed that going to the cloud could solve the company's needs for rapid deployment, and 28% had to go to the cloud because their team was small and not suitable for self-built infrastructure.

This shows that most companies have chosen public cloud or hybrid cloud solutions for cloud computing because these solutions can provide elasticity and agility and help reduce IT costs.

其他 (5%)

有，下云比上云更省钱 (15%)

有，安全、效率等范畴考虑更适合自建机房 (20%)

没有，上云可以解决企业快速部署等多维度需求 (32%)

没有，团队规模较小不适合自建基础设施，只能上云 (28%)

Experience with "going off the cloud" (moving work from the cloud to one's own server)
- *Of the 35 percent of respondents that said they had experience with cloud repatriation, they cited cost savings (15 of the 35) and security (20 of the 35) as the main reasons*

# 5. With AIGC paving a new track, how big is the impact on developers?

At the 2024 Global Digital Economy Conference, Xiaohui Yu, president of the China Academy of Information and Communications Technology, shared that "AI is the hottest field in the past two years" when launching the "Global Digital Economy White Paper (2024)." At the same time, he revealed that "as of now, there are 1,328 large AI models in the world (including different parameter versions of the same model from the same company), and the number of large models in the United States ranks first in the world, accounting for 44%, and the number of large models in China, which ranks second, accounts for 36%. "

In practice, AI technology has indeed become an indispensable part of the work of many developers, and 69% of developers said that they are using AI tools.

Although another 25% of developers are not currently using AI tools, they plan to use it in the future. This means that the development trend of AI technology is still strong, and more and more developers are beginning to realize its importance and potential.

For specific AI products, such as chatbot tools, the landing of ChatGPT at the end of 2021 has triggered a new round of AI revolution. Data shows that ChatGPT is far ahead of other competitors with a market share of 56%, which shows its strong strength and market recognition. Secondly, Baidu's ErnieBot, Alibaba's Tongyi

Qianwen, and iFlytek's SparkDesk account for 48%, 23%, and 12% of the market share respectively. These three products are well-known domestic AI large-model chatbots, and their performance is also quite good.
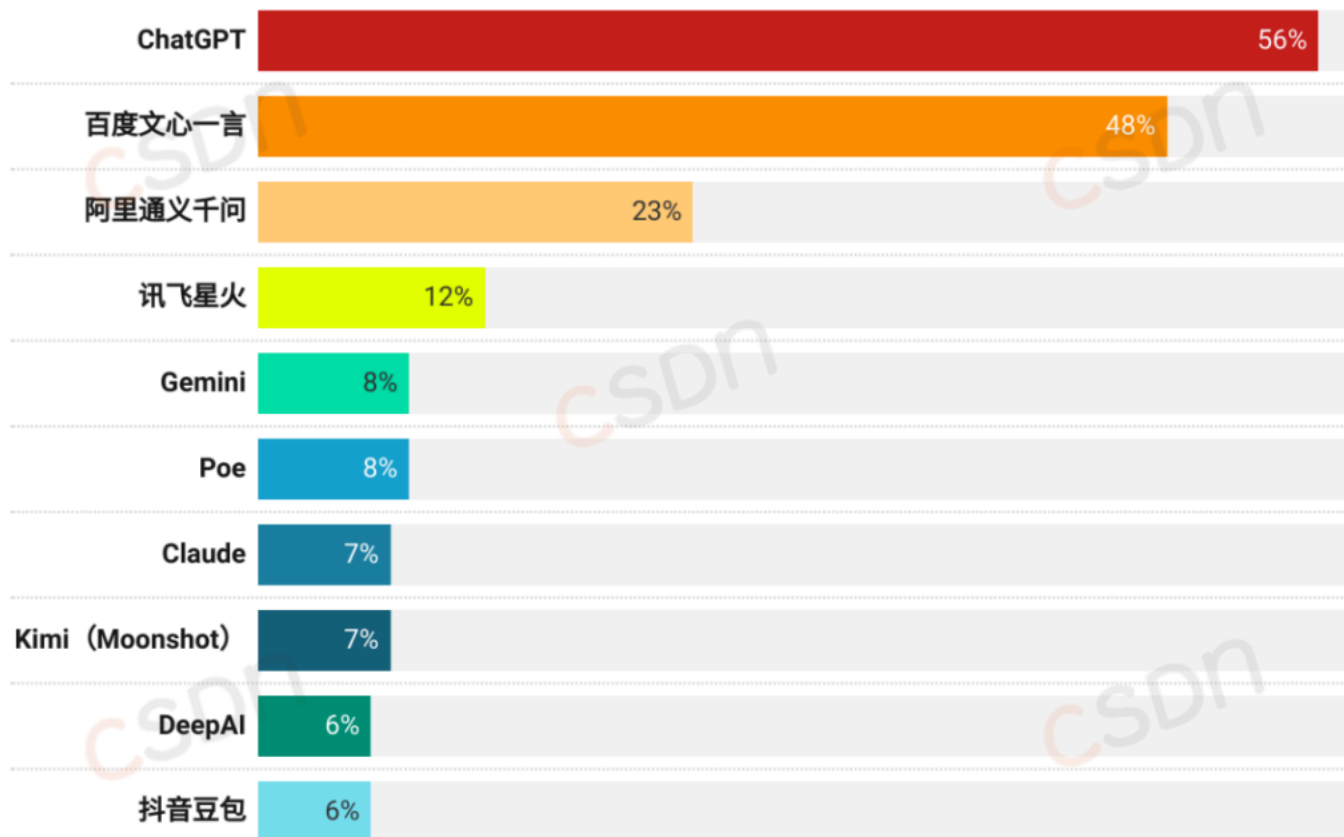
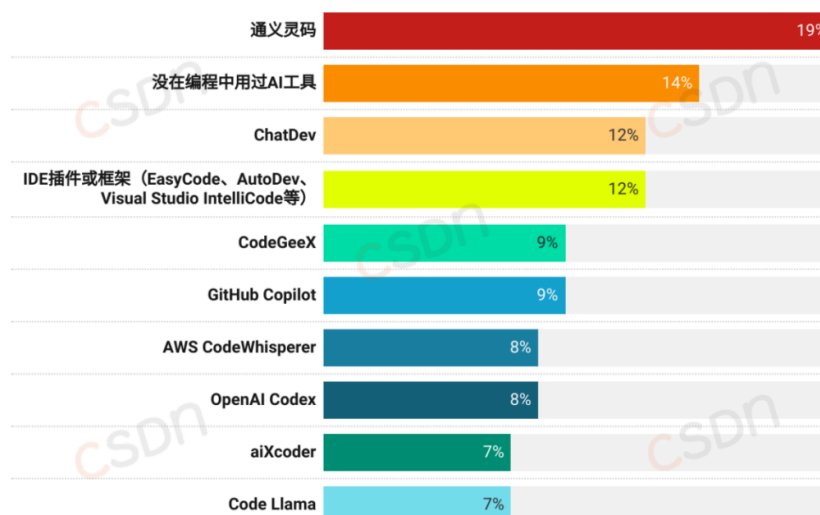*Top 10 AI chatbot usage (multiple survey items can be selected)*

If AI chatbots are the product, then the engine that gives them core competencies and powerful intelligent performance is the AI large model behind them. The survey shows that 48% of developers use GPT-4 and below, followed by Baidu's Ernie models, Alibaba's Tongyi Qianwen models, and iFlytek's Spark Desk models, accounting for 39%, 22%, and 15% respectively.
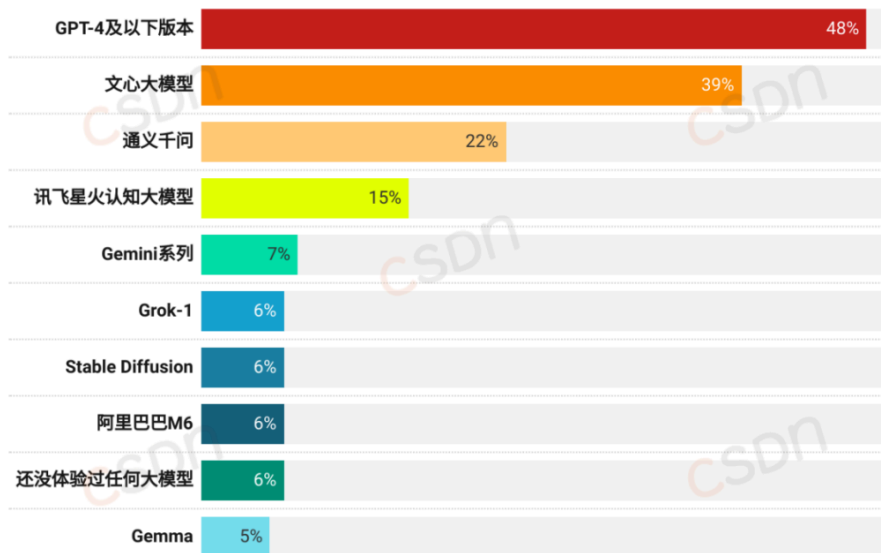
Top 10 AI large model usage (multiple survey items can be selected)

Focusing on developers' daily coding assistance tools, many developers revealed that they would also use AI chatbots such as ChatGPT, ErnieBot, and Tongyi Qianwen as assistants.

However, when it comes to AI-assisted coding tools specifically built for development, Alibaba's Tongyi Lingma ranks first in usage, accounting for 19%. ChatDev, a software development tool based on LLM-powered multi-agent collaboration, is composed of intelligent agents playing different roles. It collaborates to develop software by participating in functional workshops such as design, coding, and testing. It is loved by 12% of developers. At the same time, 12% of developers use AI-assisted coding tools directly with the help of plug-ins or frameworks when using IDE. In addition, 14% of developers revealed that they have not used AI tools in their daily development work.
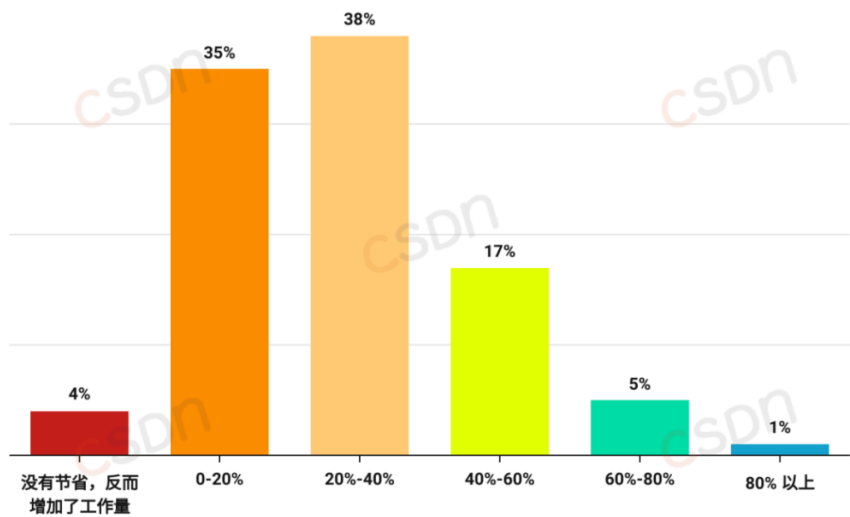

Top 10 AI coding assistance tools used in programming (multiple survey items can be selected)

Generating code, explaining bugs and providing corrections, and generating code comments or code documents are things that developers often use AI-assisted coding tools to achieve, accounting for 41%, 29% and 28% respectively.

Developers are generally satisfied with the existing AI tools in this domain, and more than 90% of developers gave out 5 points or above (out of 10 points). 19% of developers gave a 10-point satisfaction rating.

After experiencing it, 38% of developers felt that AI coding assistance tools could reduce workload by 20%-40%. Only 4% of developers believed that the use of such tools increased workload.

The impact of AI programming assistance tools on workload

Data shows that 44% of developers believe that AI coding assistance tools significantly improve the quality of code. This phenomenon illustrates the great potential of AI in automated and intelligent programming, which can significantly improve the maintainability and performance of code by reducing human errors and optimizing code structure.

However, although AI tools can generate high-quality code, 36% of developers reported that in some cases, the generated code still requires developers to rework, and it also brings about duplicate code (32%). This may be due to the limitations of the tool or an incomplete understanding of the requirements of a specific project, emphasizing the irreplaceable role of human engineers in the programming process.
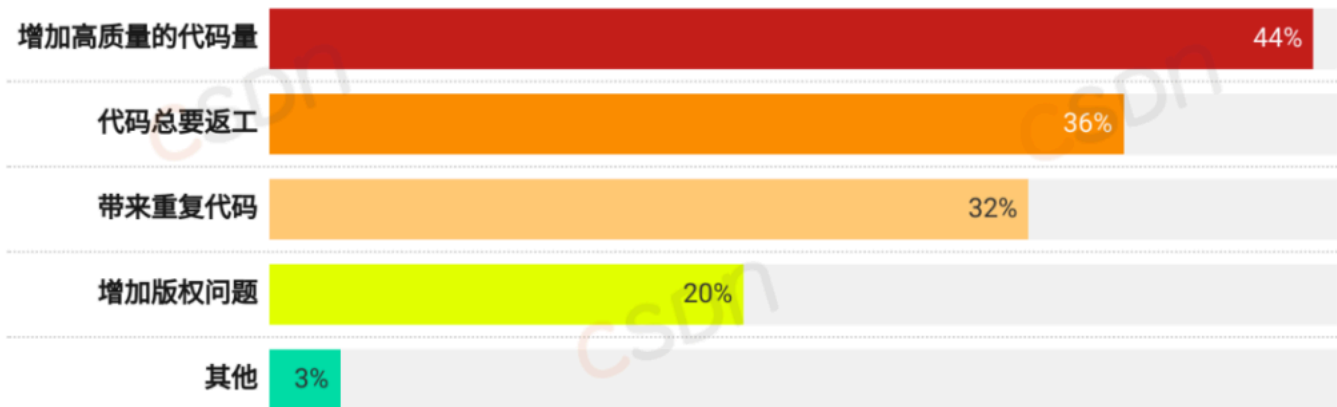
In terms of the way AI big models are presented to the outside world, "closed source" or "open source" has always been a hot topic in the industry.

From the developer's perspective, 75% of people believe that open source can promote the sharing and advancement of technology. Through open source, more developers can participate and provide diverse solutions and innovative ideas, thereby promoting the development of the entire industry. In addition, open source can prevent a few companies from monopolizing the technology and ensure the fairness and generalization of technology.

Correspondingly, 15% of respondents believe that closed source can protect the intellectual property rights of technology to a certain extent and prevent competitors from easily copying and imitating. In addition, closed source can also reduce the risk of technology being abused. Closed-source models can better control and manage the applications of AI, especially in areas involving sensitive information and security risks.

6. Open source is spreading through AI

Thanks to open source principles, which are transparent, customizable, and collaboratively shared through a community-driven process, open source software is now widely used in various industries and organizations.

However, according to data, developers who develop open-source software as their full-time job are still in the minority, at only 14%. The highest proportion of people are those who participate in open-source on a part-time and spare time basis, which is 35%. Second, 34% are freelance developers.
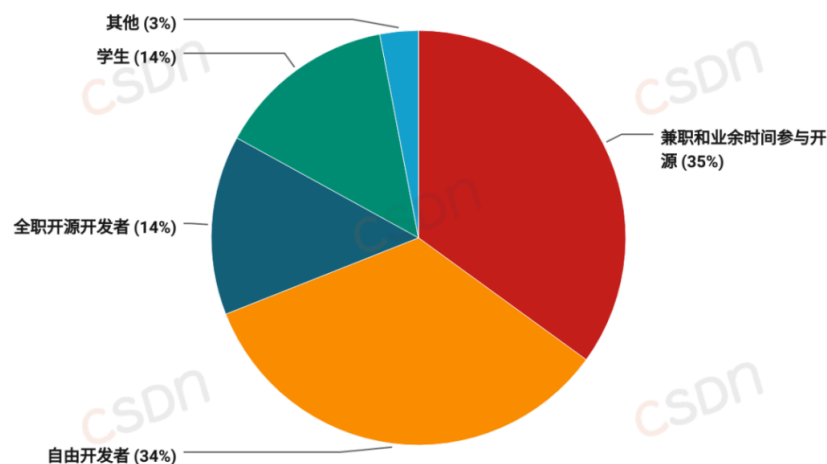
Proportion of people participating in open source

Entry-level developers in the open source field (less than 1 year, 1-2 years) account for 47%. These developers have just started to get involved in open source projects, perhaps because of professional needs, personal interests, or for learning to improve their skills. The low threshold and rich resources of the open source community are friendly to novices, so they have attracted a large number of novice developers to join.

Thirty percent of developers have 3-5 years of open source experience, can complete some tasks independently, and even begin to assume project management responsibilities. Their contributions to the open source community are more significant, including fixing bugs, developing new features, and improving documentation.
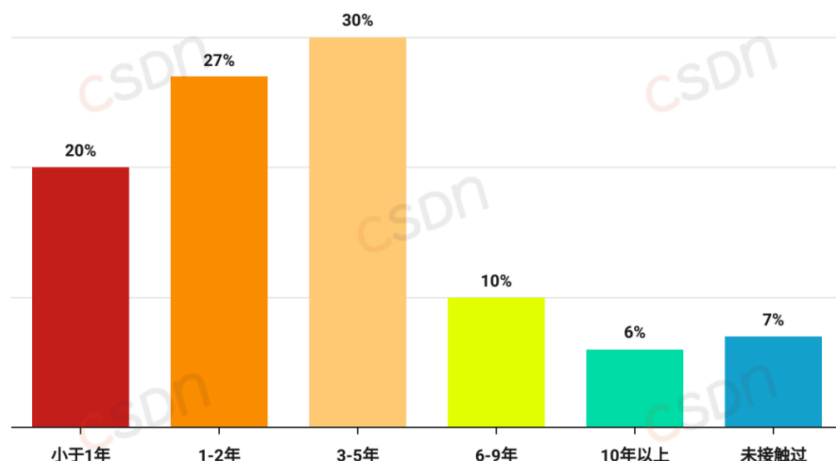
The number of years developers have been involved in open source

As shown in the in-depth survey data, more than 30% of developers mainly contribute to their own strength through code and document contributions.

When asked about the reasons for using open source software, 48% of respondents said that it was because open source software products are free and can effectively reduce development costs, which is particularly important for individual developers and small and medium-sized enterprises with limited budgets.

Next, 34% of people choose open source software because it can be redeveloped. Since the code of open source software is public, it means that developers can modify and expand it according to their own needs. This flexibility makes open source software very suitable for projects with customized needs and can quickly adapt to changing technical environments and business needs.

Yet, when investing in open source work, 52% of developers said that they had never earned income from open source. Only 8% of developers revealed that they had earned a lot of income based on open source.

Although open source software is considered a relatively safe choice due to its transparency and review by many developers, it is not completely immune to security vulnerabilities. It is worth noting that 46% of developers said that they had encountered security vulnerabilities when using open source software, which could be exploited by malicious users or attackers, causing potential risks and losses.

For organizations and individuals who use open source software, it is crucial to update and review the code in a timely manner to ensure security. At the same time, everyone should also consider using some professional security tools to reduce potential risks.

Finally, developers' focus on open source technology is mainly on AI, big data, and cloud native technology, accounting for 47%, 28%, and 24%, respectively. These fields not only represent the forefront of current technological development, but also provide developers with room for innovation. Alongside the focus of developers, we also look forward to more innovative applications.
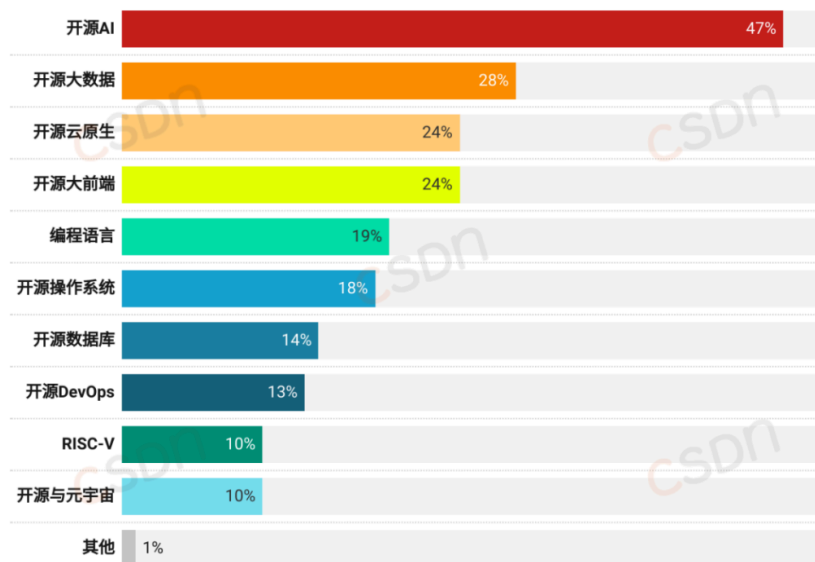
Open source technology fields that developers pay attention to (multiple items can be selected)

The above is the content of the "2024 China Developer Survey Report". We will later launch the full electronic version of the report, so stay tuned.