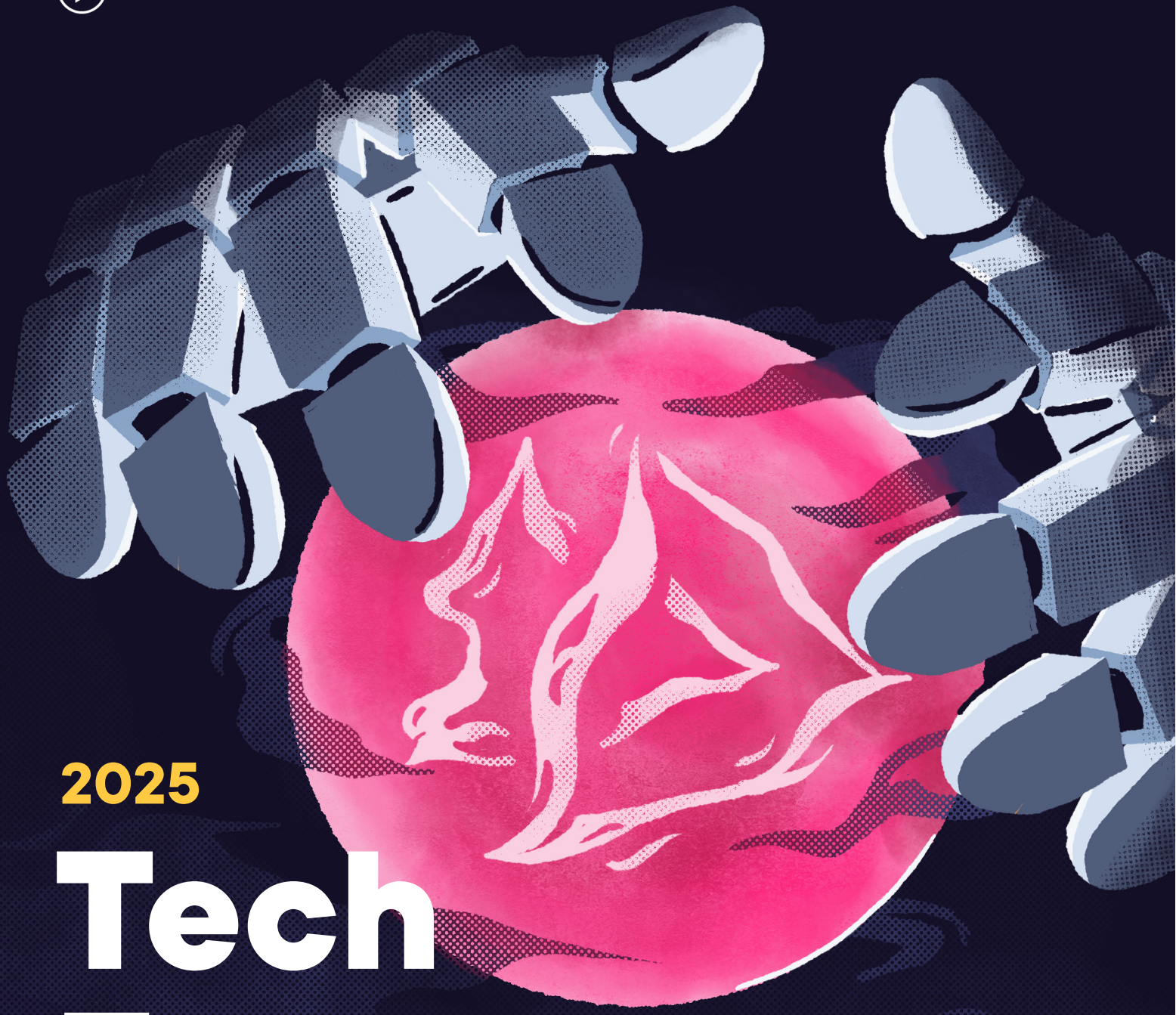
PLURALSIGHT



2025

Tech Forecast

The top tech trends, tools, and skills

Our 2025 tech trends and predictions

IT skills don't last long—only a mere two and a half years, according to industry research. And with advancements in AI and automation, this window is becoming even narrower. Nearly three in four IT professionals (74%) are worried that these advancements will make their day-to-day skills obsolete, according to Pluralsight's 2024 AI Skills Report.

Are these fears unfounded? Not exactly. 35% of executives said they have plans to invest in AI tools and technology to "eliminate unnecessary positions." The key is to be seen as necessary—and that involves constantly keeping your skills up-to-date.

To help you decide what to study next, research is critical: what companies are hiring for, what others in your field are studying, and what industry experts are saying are the top trends right now.

We've done that research for you. For this report, we've surveyed our database of over 50,000 tech learners, surveyed over 3,000 executives and technologists, and spoken to leading domain experts to uncover the top tech trends, tools, and skills you need to know to get ahead in 2025.

2025 Tech Forecast highlights

In what shouldn't be a surprise to anyone not currently sheltering under a rock, AI will continue to take center stage in 2025, with its effects rippling out across domains (and job markets). You'll want to dive deeper in the following sections for more details and for the skills you need to succeed in the coming year, but here are some of the most important takeaways from the 2025 Tech Forecast:

- Only 12% of IT professionals have significant experience working with AI, and four in five AI projects fail due to a lack of internal knowledge and preparation.
- To help their AI projects succeed and reduce risks, companies will be seeking AI, data, cybersecurity, and infrastructure professionals.
- Some of the top skills to have in 2025? Knowledge of AI Agents, LangChain, Kubernetes, and at least one cloud service (AWS, Azure).
- In software development, getting entry-level jobs will be harder, but skilled professionals will have an easier time finding work.

Trending technologies to learn about in 2025

1. AI Agents & LangChain
2. Agentic RAG
3. Python
4. Amazon Bedrock
5. Kubernetes
6. SQL
7. SLMs

The popular topics among tech learners in 2024

1 AI	8 React	15 DevOps
2 Python	9 Docker	16 GIT
3 Cloud (Azure, AWS)	10 Power BI	17 PowerShell
4 C#	11 SQL	18 Kafka
5 Angular	12 JavaScript	19 Blazor
6 Kubernetes	13 Terraform	20 Software development
7 Java	14 C	

Universal tech predictions

In 2025, AI projects will drive strong demand for AI, data, cybersecurity, and infrastructure specialists

In November 2022, the general public became aware of generative AI with the release of ChatGPT. Since then, organizations of all sizes have been scrambling to deploy AI technologies. In Pluralsight's 2024 AI Skills Report, 20% of organizations said they had formally deployed AI-related technologies and tools, while 55% said they planned to in the near future.

Are organizations deploying AI technologies?

Note: AI-related technologies include machine learning, automation, gen-AI, etc.

1. AI projects have a high rate of failure

Over 80% of AI projects fail, twice that of other IT projects. 30% never make it beyond proof of concept. The main reason is a lack of preparation, AI and DataOps knowledge, and infrastructure investments.

2. AI projects require ongoing cross-functional talent

AI projects require not only AI skills, but employees highly skilled in data, cybersecurity, infrastructure (typically cloud), and change management. Many organizations are now realizing they need skilled staff filling these functions on an ongoing basis for AI projects to succeed.

3. AI projects are never finished

Training and deployment of an AI solution is only the start, with ongoing needs for concept and data drift, compliance, R&D, cost management, monitoring, and other factors.

All of this presents an opportunity for savvy IT professionals

Why? All of these problems can be solved by having people who are knowledgeable in the right skills, and who can communicate and work with leaders on these projects. Put simply, these boil down to four kinds of "champions" that organizations will be seeking in 2025. These are:

- AI champions
- Data champions
- Cybersecurity champions
- Infrastructure champions

While AI is only one part of the field of technology, we predict discussions around resourcing, executing, and maintaining AI projects will be the primary focus for executive leadership in 2025. These discussions will have a downstream impact on other domains such as cybersecurity, software engineering, data, cloud engineering, and other fields, influencing budget allocation and skill expectations.

AI agents are going to be a significant disruptor across tech, particularly for task automation

We predict in 2025 the biggest disrupter to tech in general will be the adoption of AI agents. Agents are AI entities that can perform specific complex tasks without human intervention. Why is this so useful? You can use these agents to automate significant amounts of busywork as a professional, such as:

- Searching and fetching data from the internet
- Calling APIs
- Aiding with software development and infrastructure construction
- Creating reports from different sources
- Monitoring systems
- Following up with colleagues about certain tasks
- Updating documentation

These are all useful tasks that can take up the lion's share of someone's time, regardless of the field they're in. In 2024, Pluralsight saw a spike of interest in AI agents among tech learners on its platform, and experts are reporting a growing interest among business leaders around this technology.

> "In the last 12 months, I have seen the growth of interest in AI agents. In 2025 and beyond, I believe AI agent technology will be used in many areas of tech from software development to infrastructure automation to business processes."

Steve Buchanan
Principal PM Manager at Microsoft
and tech author

Among AI agent technology, LangChain will likely be the hot skill to learn

LangChain is a Python-based software framework you can use to develop applications powered by large language models (LLMs). LangChain allows you to create agents that use LLMs to perform specific tasks. Agents in LangChain can dynamically respond to user queries, search through documents, and perform tasks by chaining multiple LLM calls, tools, or APIs. They're specifically designed to automate and handle multi-step reasoning tasks by "chaining" actions together.

LangChain is also a flexible framework for making the creation of complex GenAI applications easier, which makes it a worthy investment for developers tasked with creating a user-friendly front end for AI.

On the Pluralsight platform, the number of tech learners interested in LangChain increased by 167% in 2024, and now ranks in our top 200 searched terms.

> "LangChain agents have the ability to disrupt the industry. However, there is a knowledge gap at the moment, which slows down adoption, in my opinion. I managed to automate 80% of the management-related tasks assigned to me, such as monitoring bug-tracking systems, following up with developers in charge of fixing bugs, updating wiki pages, and generating Power BI reports from different data sources."

Laurentiu Raducu
Founder of bitheap.tech and data and security specialist

Universal takeaways

Here are the steps you should be taking in 2025 to prepare for these trends:

Regardless of your role, get a foundational understanding of AI—more than just knowing how to use a chatbot. You don't need to become someone who implements AI, but it is important to know about it and what it can do (and what it can't).

If you are in AI, flag the need for data, cybersecurity, and infrastructure champions to ensure ongoing project success.

If you're in data, cybersecurity, or cloud/infrastructure, study up on AI. Showcase how your skills are needed to ensure any of your company's AI projects are successful.

Look into how LangChain or similar agent-based technologies can be used to improve your role. Also, note that "AI Agents" is currently undergoing a buzz cycle: not all so-called agents are equal, and just like AI washing, there are reports of "agent washing" going on.

Software development predictions

Python will continue to be the #1 programming language, buoyed by its popular libraries and ease-of-use

Python was the second-most searched topic on the Pluralsight platform in 2024, second only to AI. However, the programming language also owes a large part of its ongoing popularity to AI, as Python dominates data science and machine learning libraries, dramatically increasing its popularity and industry demand.

This is good news for beginners, as Python is a user-friendly language and considered easy to learn. The fact it continues to be relevant long after you become an established professional means it's a worthy investment of your learning time.

Being able to use AI coding assistants will be mandatory, but will cause quality problems

If you're a developer in 2025, you'll be expected to know how to use coding Copilots such as GitHub Copilot, or a free alternative like Supermaven. However, this will be matched by pressure from stakeholders to deliver faster and more often, leading to poorer quality code slipping into production.

Developers will need to learn managerial and critical thinking skills to critique the work of their "subordinate" AI agents and coding assistants, as well as refining their code review skills in a "shift left" to find bugs early and more often. Quality gates and a renewed emphasis on testing are also potential solutions for development teams.

> "[I'm concerned about] AI tools like GitHub Copilot, which give the wrong impression that the output of engineers has increased significantly. In reality, these tools are not mature enough and the resulting code can affect the productivity of the engineers, forcing them to debug the outputted buggy code. This results in downtimes but can also cause disruptions in critical infrastructure."

Laurentiu Raducu
Founder of bitheap.tech and data and security specialist

Getting entry-level jobs in software development will be harder, but getting senior positions will be easier

In 2025, two factors are going to make it harder to get that first-time job as a developer:

1. Companies are still hurting post-COVID due to a downturn in consumer spending and have less to spend on hiring new staff
2. AI can substitute for junior developers

While it won't happen immediately, this will have a long-term impact on the number of senior software developers in the market, as there will not be the same number of positions and opportunities needed to reach this level. The silver lining here is if you're already an experienced developer, you're not going to have a shortage of options.

For aspiring developers, the burden will be greater than ever on having skills comparable to a practicing software engineer rather than a junior in order to land a job. Upskilling with hands-on projects and learning modules can help here, as well as learning to be the one using the AI tools and agents being used by development teams.

According to expert developers, having strong abilities in the hard "core" technical topics—such as learning a low-level language—as well as having great communication, continuous learning, and problem-solving skills are a must. Build on top of your skills with knowledge of cloud-native technologies and AI, and nurture your skills in popular languages such as Python, JavaScript, Java, and Rust.

> "The biggest looming threat in software development that I see is the need for seniors, but the disappearing need for juniors. With GenAI there will be a lower need for juniors as we are no longer 'creating' seniors....Currently there are plenty of jobs for skilled people with experience, but getting your first job is hard."
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> **Maaike van Putten**
> Best-selling JavaScript author, IT trainer, and software developer

The EU Accessibility Act will impact the design of digital products for European consumers

As a species, it's no secret that we are woeful when it comes to accommodating people with disabilities. In 2025, 95.5% of home pages had accessibility issues, according to WebAIM **research**. To help solve this gap in representation, the European Accessibility Act (EAA) 2025 was developed, and will come into effect on June 28, 2025, to encourage organizations to uplift their digital accessibility standards.

Like most EU legislation of this type, non-compliance will potentially result in legal repercussions. Those found not to be compliant after the June deadline will be issued with a fine of up to €1,000,000, depending on the severity and context of the infraction. This act affects businesses operating within the EU, as well as those outside the EU but providing services to EU residents. Given the open nature of the internet, this is practically every organization that offers a web-based solution.

Thankfully, meeting this legislation doesn't mean having to learn a whole bunch of new accessibility standards. Compliance revolves around identifying accessibility gaps against EEA and WCAG, and the latter has been around for a very long time. While you don't have to learn the whole of WCAG by heart, it is surprisingly easy to learn the fundamentals, use its testing examples, and refer to it whenever you're making design decisions.

> "Accessibility is a hot topic [in Europe] due to the upcoming European Accessibility Act. In 2025, there will be more AI and a bigger focus on accessibility, security, and sustainability."
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> **Maaike van Putten**
> Best-selling JavaScript author, IT trainer, and software developer

Angular, Blazor and React will continue to be extremely popular frameworks for different scenarios

These three frameworks were all in the list of top 20 topics searched for by tech learners in 2024. We predict this popularity will continue into 2025, particularly with the projected release of .NET 10 in November 2025.

Most popular skill IQ tests for software developers

On the Pluralsight platform, we offer the ability for learners to do Skill IQ tests—expert-curated tests that allow you to rate your current proficiency in a certain area. Here is the data from our learners in 2024 to inform your own upskilling journey. Why not test yourself and see how well you score?

Software development takeaways

Here are the steps you should be taking in 2025 to prepare for these trends:

If you're an aspiring or junior developer, be prepared for more difficulties getting your start in the field, and **spend time upskilling so you can prove your superior value over an AI coding assistant.**

Nurture your skills in **popular languages such as Python, JavaScript, Java, and Rust**, as well as **cloud-native technologies** and **AI**.

Learn to use AI coding assistants, but always make sure to put quality checks around your work and those of others—never trust, always verify.

To stand out, make time to work on your soft skills such as **communication, continuous learning, teamwork, critical thinking, and problem-solving.** These will often make you stand out more than your technical skills, though both are important.

Study up on accessibility frameworks such as WCAG and think of the users impacted by these at project inception.

Cloud and IT Ops predictions

Cloud professionals will still be in strong demand as organizations struggle to launch their AI projects

If you're worried your cloud skills will become obsolete in the near future, don't be. Many organizations are still at the early stages of adopting cloud computing, and they still haven't built a workforce that's literate enough in foundational cloud skills, according to industry experts. In Pluralsight's State of Cloud report, our research discovered 69% of leaders didn't have a clearly defined cloud strategy to guide their implementation, and they are now paying the price.

We predict that since many organizations took shortcuts on their transition to cloud computing—opting for lift-and-shift migrations that resulted in high costs, poor performance, and increased security risks—they've still got a lot of work establishing fundamental cloud-native practices before jumping into generative AI. Without doing this groundwork, these AI projects are built on shaky foundations.

"The current state of cloud computing is a tale of two enterprises separated by a large divide of maturity. For disciplined organizations that spent the past decade investing in cloud-native practices and skills, their leaders will be focused on leveraging that solid foundation as a springboard for implementing generative AI solutions in 2025. On the other side of the chasm, enterprises that focused on 'lift-and-shift' migrations to secure quick wins are now paying the price."

Drew Firment
AWS Community Hero and
Enterprise Strategist, Pluralsight

Having multicloud and hybrid skills will be popular, as organizations try to manage legacy infrastructure

Anyone who's walked into an infrastructure-related position in an organization knows there's often a vast gulf between best practice design and what you're actually working with. According to Pluralsight's State of Cloud report, 85% of organizations have adopted multicloud strategies, but only 9% have multicloud experience, leading to awkward implementations. On top of this, many organizations are stuck with half of their infrastructure in their own data centers and the rest in the cloud.

For these reasons, we predict in 2025 there will be ample need for cloud engineers who can manage this mix of infrastructure.

> "Until organizations can finally get around to migrating workloads from their mainframes, most private data centers will continue to coexist in a hybrid model with a predominant public cloud provider. While using a single public cloud provider is the ideal approach to avoid draining talent and value, the sprawl of multicloud will still be prevalent in 2025 given the difficulty of unwinding those decisions."

Drew Firment
AWS Community Hero and
Enterprise Strategist, Pluralsight

Kubernetes is the new Linux and will continue to be extremely popular, along with Docker

Among tech learners, both Kubernetes (K8s) and Docker consistently remain in the top 10 searched topics. We predict Kubernetes will continue to be an in-demand skill, especially as organizations use K8s to assist with their AI/ML workloads. The need to encapsulate applications so they run in different environments with Docker will also not go anywhere.

There will be a push by some AI projects for on-prem over cloud

In 2024, some organizations have shifted to using on-premises infrastructure for their AI projects due to concerns around data security, a desire to reduce network and vendor dependence on AI availability, and to reduce recurring cloud costs for massive data sets and long-term use.

For these organizations, we predict the side effects of this shift will be an increase in demand for people with the technical expertise to run in-house IT infrastructure mixed with specialized AI skills. This trend may reverse as companies weigh up these needs against needing skilled staff, having to make large upfront investments in physical infrastructure, and the lack of quick, easy scalability.

Most popular skill IQ tests for cloud learners

On the Pluralsight platform, we offer the ability for learners to do Skill IQ tests—expert-curated tests that allow you to rate your current proficiency in a certain area. Here is the data from our learners in 2024 to inform your own upskilling journey. Why not test yourself and see how well you score?

1. Cloud computing fundamentals
2. Architecting in AWS
3. Active Directory & Extra ID Admin
4. AWS Identity & Access Management
5. AWS Storage
6. AWS Cloud Compute
7. AWS Cloud Security

Cloud and IT Ops takeaways

Here are the steps you should be taking in 2025 to prepare for these trends:

Become familiar with a number of different cloud services and working with hybrid cloud environments, so you're prepared for a wide range of different legacy infrastructure scenarios.

Study Kubernetes and Docker, as these will become more important in 2025.

Do your research into AI and its intersection with cloud computing, and be prepared to have conversations about whether or not AI should be handled in the cloud or on-prem.

Be aware of a higher impact on infrastructure as AI becomes more commonplace as an external and internal service, and prepare accordingly.

AI and ML predictions

The shortage of AI-specific talent will continue in 2025, leading to significant job opportunities

Only 12% of IT professionals have significant experience working with AI, according to Pluralsight's 2024 AI Skills Report. Meanwhile, there's a high level of recognition among executives that they need people with these skills—95% of executives believe AI initiatives will fail without staff who can effectively use AI tools.

Naturally, a low number of skilled practitioners and high demand spells opportunity. More importantly, AI projects are failing because executives themselves don't know what they need for these projects to succeed. Organizations seeking to adopt AI are planning to allocate an additional 17% of budget to AI in the next 12 months.

This presents an opportunity for AI practitioners and champions who have the following traits:

- Knowledge or experience about how to adopt AI at scale
- Awareness of different AI solutions and best use cases for each
- Can list out all the factors that are involved in the success of an AI project
- Can communicate clearly with leadership about all of the above
- Can map the actual AI product to measurable KPIs and business requirements, and knows how to measure them
- Ability to identify and work cross-functionally with all the project stakeholders

In terms of growth potential, professionals with these skills will have the ability to fill lucrative, in-demand roles as AI and machine learning engineers, AI product managers, ethical AI specialists, AI research scientists, and other AI-related roles. On the upper end, the Chief AI Officer (CAIO) role is fast becoming a fixture in the C-suite, with compensation packages averaging well above $1 million in certain **geographies**.

> "In 2025, the key to learning and evolving with AI models will be hands-on experimentation, an open mind, and a sense of humor. Artificial intelligence will continue to evolve at a rapid pace, so learners and educators will need to adapt their approach and embrace trial and error to keep pace."
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> **Hampton Paulk**
> Principal Author, GenAI, Pluralsight

Organizations will hire for Agentic RAG skills to make LLMs more useful and knowledgeable

In 2024, there were two significant advancements in AI people were talking about: **Agentic AI** and **Retrieval-augmented Generation (RAG)**. To simplify:

- **Agentic AI** are AI systems that can act autonomously, performing tasks with their own decision-making capabilities (LangChain agents are an implementation of Agentic AI).
- **RAG** refers to AI that can search an external data source to enhance the accuracy and relevance of their answers—think of ChatGPT searching the internet before giving you an answer.

In 2025, we predict organizations will be seeking specialists who can combine these two techniques to create highly autonomous AI agents that are empowered by your business data or other relevant information sources, known as **Agentic RAG**.

On the Pluralsight platform, the number of tech learners in 2024 interested in RAG increased by over 1200%. While there was no interest in Agentic AI or Agentic RAG in 2023, learners are now becoming aware of and searching for ways to learn about this technology. We expect to see a large spike in tech professionals seeking to upskill in both of these areas in the next 12 months.

AI agents vs Agentic AI

AI Agents and Agentic AI are related but separate types of AI. The main difference is between the level of autonomy and complexity in decision-making each type embodies.

AI agents are task specific and designed to accomplish predefined objectives within constrained environments. Think chatbots, recommendations, or virtual assistants.

Agentic AI are "AI with agency." They have a high level of autonomy and can pursue independent goals without specific instruction from humans. They're typically used for complex, multi-step problems.

SLMs will become the focus in 2025 with the push for efficient edge AI and embodied AI

We predict that the AI industry will shift significantly towards SLMs (Small Language Models) as an alternative to LLMs (Large Language Models). There are several reasons for this, such as:

- Running an AI on edge devices with limited hardware requirements
- Running an AI with lower cloud resource allocations
- Significantly reducing or eliminating the need for costly GPU training
- Achieving low latency for embodied AI (AKA Putting AI in humanoid robots)

LLMs will still have their place in situations such as advancing new scientific discoveries, but SLMs will be used increasingly for situations where the full power of an LLM is not needed. Put simply, you don't need a helicopter to fly to the supermarket. Practitioners should learn to work with SLMs in 2025 in order to build better fit-for-purpose solutions.

AWS Bedrock will rise in popularity as a resume skill, as AWS closes the gap with Azure's AI offering

AWS Bedrock is a fully managed service for building generative AI applications using the cloud, allowing you to experiment with different models for your use case, customize them for your needs, and create agents to complete tasks (Agentic AI). It also supports RAG to enrich FM responses, and combined with the various models to choose from, we predict this combination will pay off in a big way in 2025, particularly for organizations who have already invested in AWS as the company with the largest cloud computing market share.

As of late 2024, AWS has also invested in giving learners an avenue to take AI-specific foundation and practitioner certifications. In the past, there was only the notoriously difficult AWS Machine Learning Specialty, but now there is the beginner-friendly **AWS Certified AI Practitioner** and **AWS Machine Learning Engineer - Associate**, giving people a clear pathway to follow.

Responsible and ethical AI adoption will be a rare and valued skill, particularly in companies in or dealing with the EU

Among tech learners, there is a worryingly large gap between those seeking to learn how to implement AI and those who are interested in ethical AI frameworks. Among the tens of thousands of tech professionals who used Pluralsight to learn how to use AI, less than 2% sought how to adopt it responsibly, or one in 54 people.

Ethical AI adoption isn't just a matter of being able to sleep at night regarding your societal impact—it's a way of mitigating risks and negative consequences that can come with using AI, all the while maximizing positive outcomes. Quite a few of those risks can be the business-ending kind—such as danger to humans, breaches of consumer privacy, illegal AI use, or brand damage.

Additionally, new legislation is coming into force that penalizes organizations for not adopting AI ethically. On August 2, 2024, the EU AI Act entered into force, with potential fines of up to EUR 35 million or 7 percent of the global annual turnover of the relevant entity in the previous year, whichever amount is greater.

While this is European legislation, it applies to anyone who provides, deploys, imports, distributes, or manufactures an AI system with a link to the EU market. Notably, even if your organization is not in the EU, if the output produced by your AI system is being used in the EU, you can run afoul of this legislation. The EU AI Act is being slowly rolled out over time, with levels of enforcement increasing over the next few years.

If you are in the EU, this presents a particular opportunity, as experts involved with EU AI Act enforcement are already discussing the staffing requirements to enforce this legislation. Meanwhile, affected organizations are already seeking to hire external agencies and internal talent to help them avoid being stung with these hefty fines.
In the rush to adopt AI, we predict organizations across the globe will begin to realize the importance of having ethical AI specialists in order to protect their organizations moving forward, whether it's from legal, brand, financial, or other risks.

"In terms of concerns for the tech industry in 2025, I'd say AI and inclusivity, AI ethics, and AI and security. I think the problems will have to become more apparent for a clear solution to come forward. Don't get me wrong—I quite love AI and I'm absolutely fascinated by it—but I don't think we have a society or technical landscape that's ready for it."

Maaike van Putten
Best-selling JavaScript author, IT trainer, and software developer

Environmentally friendly AI development will be a large focus, with mixed results

We predict that in the next few years, organizations will be trying to find ways to offset or reduce the carbon footprint of their AI usage. This will be due to a range of factors such as the rise of ethical consumerism, using green practices as a brand differentiator, media callouts on carbon-intensive products, and legislative pressures on companies to reduce their environmental impact.

There are several solutions that can help achieve this: the use of SLMs over LLMs, increasing the efficiency of foundational AI algorithms, and more diligence about choosing the right tech solutions for business problems, tracking and offsetting emissions, and so on. At the same time as this is going on, increased efficiencies in AI, as well as reduced cost and accessibility, will likely drive up usage in a manner similar to Jevons Paradox, piling on top of environmental concerns.

"In the last 12 months, a trendy topic with the rise of AI is discussions about green software development and sustainability, and coding in a way that minimizes energy usage."

Maaike van Putten
Best-selling JavaScript author, IT trainer, and software developer

Most popular skill IQ tests for AI learners

On the Pluralsight platform, we offer the ability for learners to do Skill IQ tests—expert-curated tests that allow you to rate your current proficiency in a certain area. Here is the data from our learners in 2024 to inform your own upskilling journey. Why not test yourself and see how well you score?

1. AI Foundations
2. Prompt Engineering
3. Machine Learning Literacy
4. Python 3
5. Data Science Literacy
6. AWS Machine Learning / AI
7. Microsoft Azure AI Solutions

AI and ML takeaways

Here are the steps you should be taking in 2025 to prepare for these trends:

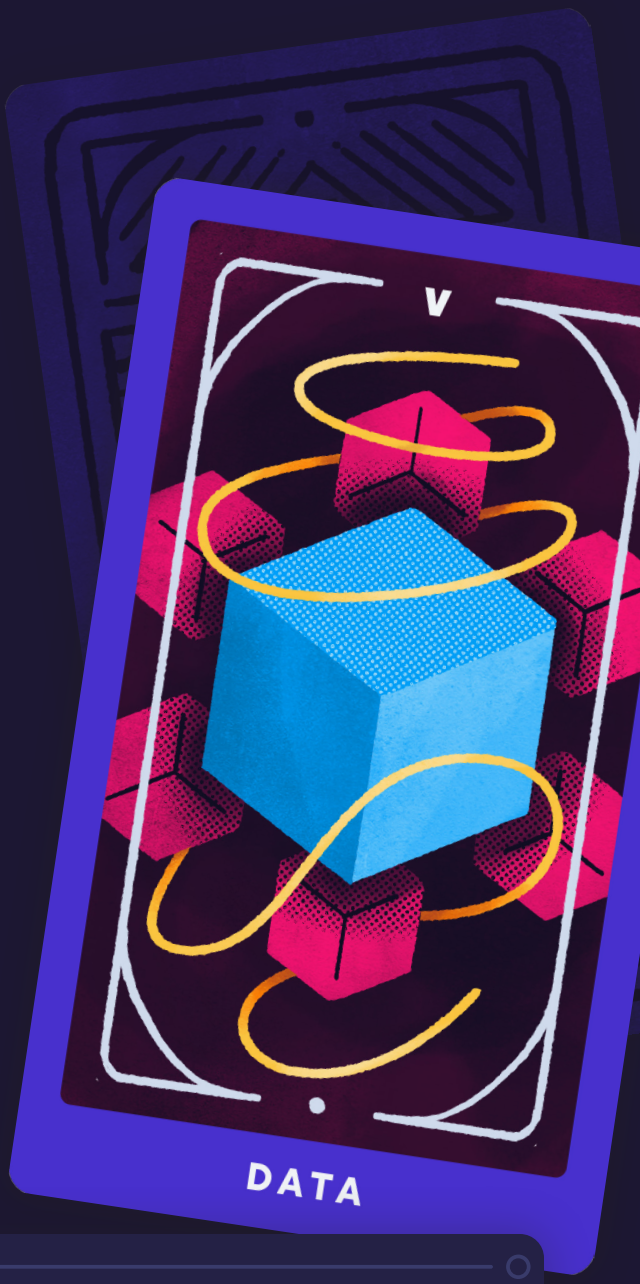
Study up on all the different AI solutions, and when it is best to use each one, or not use AI at all. In particular, research SLMs, Agentic AI and Agentic RAG, and cloud-based solutions such as AWS Bedrock.

With your AI projects, consider how to measure KPIs, map to business goals before the project commences, and communicate the risks to business leaders.

Become well-versed in ethical and responsible AI frameworks and how to implement AI in the most sustainable way possible.

Know your legislative requirements, particularly if you have customers in the EU.

Data predictions



Proper data strategy is necessary for AI strategies to succeed

"Garbage in, garbage out" is the truism when it comes to AI projects, and organizations are already beginning to realize these initiatives are frequently failing due to a lack of attention given to their underlying data. To ensure the success of these projects, there will be an increased need for data specialists in 2025 and beyond to clean up what has often been a neglected area of the business.

The scrutiny around generative AI is bound to drive increased regulations and compliance around data in 2025, leading to a rise in "Data Compliance as a Service." As usual, organizations will be still looking for ways to leverage their own data for competitive advantage. In short, it's a good time to be in data science.

"Generative AI models require massive amounts of data, which is mostly unstructured and ungoverned. Many enterprise architectures lack a modern data strategy and are not ready for the complexity and operational demands of AI workloads. As a result, the quality and integrity of the underlying data generates outcomes that are often unreliable, unpredictable, and outdated—creating significant concerns with data privacy and security."

Drew Firment
AWS Community Hero and
Enterprise Strategist, Pluralsight

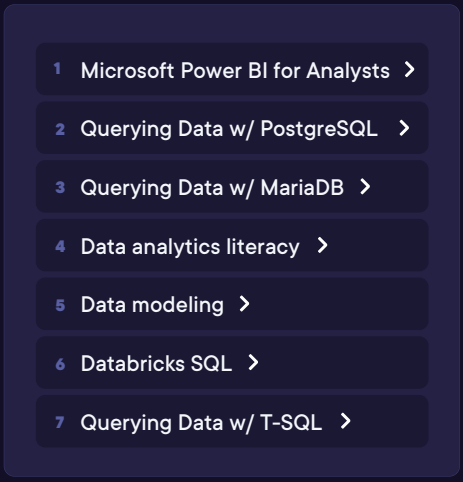
SQL is still incredibly popular among tech learners

In 2024, SQL continued to be one of the most popular upskilling topics among aspiring and existing tech professionals. Among our Skill IQ tests, SQL Essentials was our fourth most-taken test, with 58% ranking as SQL proficient and 12% as SQL experts.

Since SQL is a key skill for any data professional and is supported by the major cloud providers, we believe it will continue to be relevant for professionals in the foreseeable future.

Most popular skill IQ tests for data learners

On the Pluralsight platform, we offer the ability for learners to do Skill IQ tests—expert-curated tests that allow you to rate your current proficiency in a certain area. Here is the data from our learners in 2024 to inform your own upskilling journey. Why not test yourself and see how well you score?



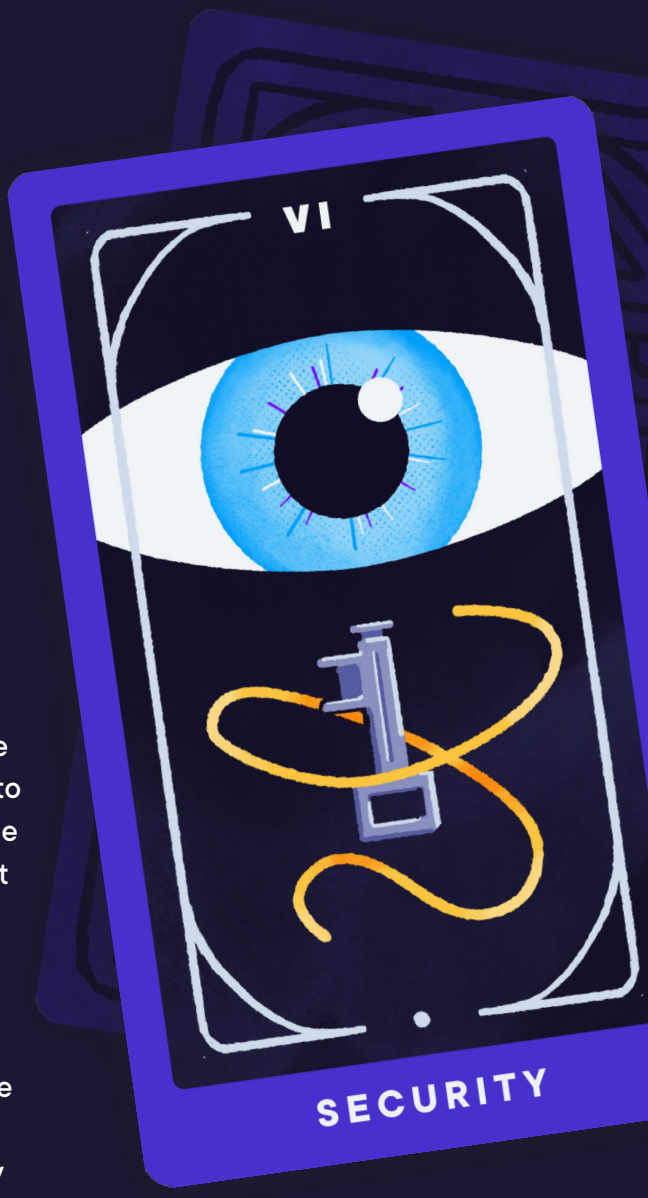
Data takeaways

Here are the steps you should be taking in 2025 to prepare for these trends:

Prepare to seize the opportunity to promote the importance of your role as a data professional and your team in regards to AI success and how companies need to invest in data hygiene.

Learn and improve your skills in Machine Learning, SQL, data visualization, critical thinking, problem solving, and most importantly, communication.

Cybersecurity predictions



Cyberattacks will be more common, as AI lowers the skill requirements for bad actors

For the last two years, the news has been filled with cybersecurity experts sounding the alarm that AI is going to fall into the hands of adversaries in a big way, and in 2025, we predict the number of cyberattacks will continue to rise. Defenders will be slower to utilize these tools due to financial, organizational, skill, and other restraints, while the other side will have ample reasons to utilize them for profit as soon as possible.

The silver lining here is that if you're looking for a career with high levels of demand, then cybersecurity will be on that list in 2025, especially if you have AI-related skills. The downside will be that there will be a lot of work to do, and cybersecurity in particular is a field where staff historically experience high rates of burnout.

> "We are going to see more attacks as AI can be easily weaponized for malicious purposes. Even attackers without a solid programming background will be able to define dangerous scripts."

Laurentiu Raducu
Founder of bitheap.tech and data and security specialist

PSA: AI alone can't still conduct a cyberattack

Over the last year, there has been a lot of coverage around the term "AI-powered attacks," which is a misleading term that indicates organizations should shift their security focus—including budgets and assets—to AI threats and attacks. However, even with all the buzz around Agentic AI, it's important to note that AI are not making cyberattacks on their own, but rather giving threat actors a way to act at scale.

> "The fact of the matter is that AI is not creating cyberattacks. The attacks are still conducted using the same methods and tactics, and AI's role is simply to increase the scale and efficiency of attackers and threat groups."
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> **Bri Frost**
> Director of Curriculum,
> Cybersecurity and IT Ops, Pluralsight

Threat intelligence will become more crucial across all areas of cybersecurity in 2025

As the threat landscape becomes more sophisticated and bad actors further hone their craft, organizations must have skilled threat intelligence teams to defend themselves. Traditionally, the security story has played out with defenses being improved and attackers thwarting them, and then this pattern repeats itself. In 2025, organizations will need to completely shift this scenario by focusing more on red teams testing their own environments against the most sophisticated threats to identify and assess vulnerabilities.

"While expertise in coding, cloud, DevOps, and other areas will remain crucial, more advanced skills like threat intelligence and reverse engineering have emerged as the most valuable advanced cybersecurity skills going forward. Furthermore, roles such as cybersecurity data scientist and exploit developers will become more prevalent and will offer more opportunities for technologists to refine their skills and stay relevant in their current roles."

Chris Herbert
Chief Content Officer, Pluralsight

DDoS attacks on LLMs, data exfiltration, and other threats on AI will be significantly underestimated

As organizations rush to implement AI, not many appear to be aware of how this significantly increases their attack surface. For example, a DDoS attack on an LLM can cost an organization millions in inference fees, while private and confidential data can potentially be exfiltrated from these models.

If you are planning to work with or are currently working with AI, or you're working in cybersecurity, it is a good idea to read up on the **OWASP Top 10 vulnerabilities for LLMs**, and the **Top 10 for APIs**, as these underpin a lot of generative AI solutions.

Modern cryptography won't be toppled by post-quantum (just yet)

If you're learning about cryptography, don't be freaked out by the premature calls that the RSA encryption scheme has been cracked and the age of post-quantum cryptography (PQC) has suddenly dawned. While this is certainly going to happen, it's a long way off.

Even when quantum computing matures enough to crack these algorithms, it's going to take decades to crack the majority of keys, barring further advancements. However, organizations will need to start thinking about implementing PQC sooner rather than later, since it's something that's also going to take years to do.

Long story short? Don't stress about PQC breaking everything tomorrow, but do start planning and upskilling for when tomorrow becomes today.

More effective anti-deepfake tools and services will begin to appear on the market

Most people are familiar with deepfakes that depict well-known public figures saying or doing something outrageous. Right now, there are not highly effective countermeasures to detect and identify deepfakes. However, as AI-generated deception begins to pose a threat against the general public, such as being used to gain access to sensitive personal data and banking information, we believe there will be a spike of investment in combating this problem.

> "In 2025 and beyond, I hope to see more techniques to defend against deepfakes, such as having the skills to create one yourself and then compare it to an authentic video. By comparing deepfakes to legitimate videos—including examining metadata and video composition—security professionals can learn how to identify and counteract deepfakes."

Bri Frost
Director of Curriculum,
Cybersecurity and IT Ops, Pluralsight

Organizations that block AI unilaterally will see rampant AI use by rogue employees

We're notorious for using anything that makes our lives easier, regardless of the risk involved. In 2025, employees who see the benefit of artificial intelligence and LLMs are going to find ways to use the technology to reduce repetitive and menial tasks in their workflows.

If organizations don't provide employees with these tools, employees are going to use them anyway, which will in turn put company data at risk.

"In 2025 and beyond, organizations must invest in enterprise-wide AI tools to support employees and ensure data privacy and security. Organizations that don't make the investment risk falling behind and jeopardizing sensitive information."

Hampton Paulk
Principal Author, GenAI, Pluralsight

Most popular skill IQ tests for security learners

On the Pluralsight platform, we offer the ability for learners to do Skill IQ tests—expert-curated tests that allow you to rate your current proficiency in a certain area. Here is the data from our learners in 2024 to inform your own upskilling journey. Why not test yourself and see how well you score?

1. Security Fundamentals
2. Networking Fundamentals
3. Web application security
4. DevSecOps Foundations
5. Spring Framework: Securing Spring
6. Fundamentals of SRE
7. AWS Identity & Access Management

Cybersecurity takeaways

Here are the steps you should be taking in 2025 to prepare for these trends:

Be prepared to be more in demand and busier than ever with the rise in AI-empowered bad actors and an increased number of attack points. As always, **prioritize your mental health** (and if you're a leader, that of your teams).

Study up on the top vulnerabilities for LLMs and APIs, so you are prepared to reduce these risks, and have conversations about them with your organization.

Start thinking about **long-term implementation of PQC.**

Keep an eye out for any **advancements in anti-deepfake technology.**

Make sure that you implement a thoughtful AI-use policy instead of an outright ban to reduce the risk of rogue AI use.

CONCLUSION

2025 is the year of AI, and expect it to dominate everything

If you didn't sense it from this report, AI is absolutely overwhelming discussions in every IT discipline right now, and this is set to continue for at least the next 12 months. Only time will tell if it will die down by 2026 and beyond. For IT professionals seeking to stay ahead of the latest trends and avoid risking skill obsolescence, learning all about this new technology is a smart bet, if only to have conversations about where or if to use it.

More fundamentally, the most important skills you can work on as an IT professional are continuous learning and adaptability. These will serve you well regardless of if it's 2025 or 2035, since you'll always be up with the latest knowledge and be prepared to adjust at a moment's notice. The only surefire way to keep your skills from lapsing and to position yourself for career success is to always keep learning, and learning something new is never a waste of time.

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