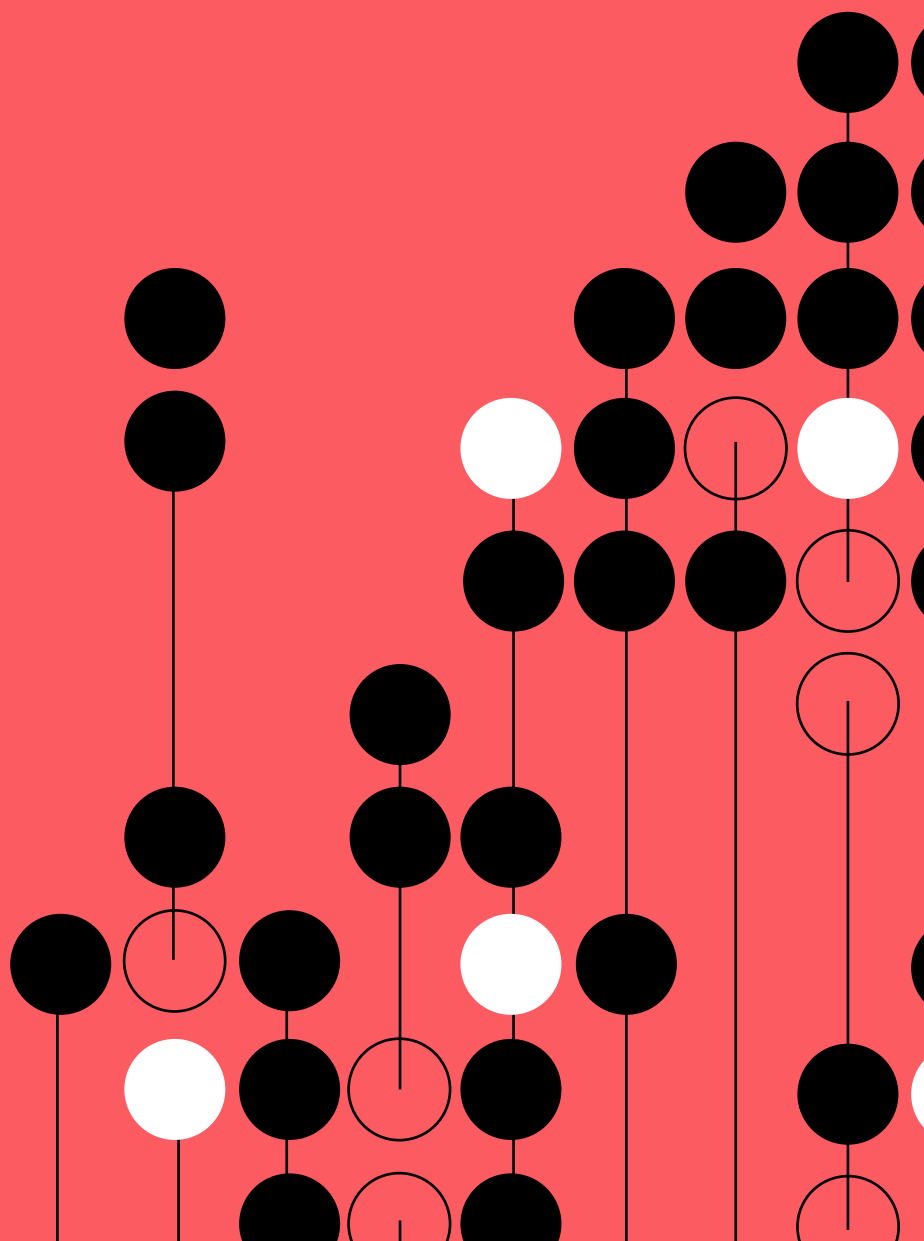


The top 10 AI skills your team needs to put your cloud to work





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The top 10 AI skills your team needs to put your cloud to work

When it comes to the cloud, man's reach tends to exceed its grasp. Our brains ask, "What if?" much faster than your development team's AI skills can catch up.

While the cloud enables faster release cycles, global business operations, and lower costs, many cloud projects and migrations crash and burn (or sit on the shelf waiting for access to the correct data). An AI project is an expensive endeavor. Broken and abandoned AI projects can quickly cost an organisation millions—and that's just for the projects that don't work.

With the wealth of data in the cloud, AI is perfectly suited to speed up everything from development to security. However, anyone who has spent time in a large organisation knows that the existence of data and access to data are not the same. The technology, infrastructure, and team needed to parse and make sense of data is often inadequate or nonexistent.

How do AI Skills impact cloud computing?

AI and cloud computing are common buzzwords in the SaaS world, but it's important to understand how they complement each other.



AI is when a machine uses simulated human intelligence to perform non-menial tasks. This is achieved by feeding massive amounts of data into machine learning models.



Cloud computing is also data-oriented but is more concerned with providing services like storage, software, and databases over the internet.

But you probably already knew that.

When the powers of AI and cloud computing combine, they can exponentially increase each other's capability. Cloud systems can provide the data to scale machine learning while serving as the infrastructure to deploy AI models. Conversely, those AI models can automate cloud computing tasks to streamline and automate complex processes or optimise UX and system performance.

The Top 10 AI Skills Your Tech Team Needs

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02 Machine Learning (ML) Expertise

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09 Supervised, unsupervised, and reinforcement learning

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How does your team combine the power of AI and cloud computing?

Start with one skill at a time.

You shouldn't jump into a six-figure AI project without building a smaller network of skills and projects first. The truth is that most teams don't have what they need to take on larger AI projects at this point in the technology's lifespan. We wouldn't see so many AI implementations left unused if they did.

"Doing AI" isn't enough. You must "do AI" well to create and implement models that deliver positive organisational outcomes.

Starting with a few AI skills, your team can reap AI's benefits while providing proof of concept to the rest of your organisation as to what is possible.

With a bit of **planning, intentionality, and AI skills training**, your team could:

- Monitor cloud platform security for breaches
- Increase network efficiency with resource and load balancing
- Reduce costs through usage pattern analysis
- Provide end-user experience personalisation.

01

Data Science and Data Analysis

Data is the raw material that AI uses to learn, predict, and perform tasks. Knowing what data is vital to which desired outcome or business goal is a crucial first step in building any AI model.

By using AI to power your data analytics, you can find patterns and observations that will inform IT and cloud operations and, in some cases, high-level operational and organisational decisions — much faster than humans could. The quantities of data held in the cloud are simply impossible to analyse without the use of AI.

Data science is a foundational building block of using AI and understanding the value AI can bring to your organisation. Using AI for data analysis is an essential AI skill on its own. But it's also a crucial first step in almost any AI project since data processing is a critical machine learning component.

“You can't just jump into the world of training AI models without some technical background and an understanding of basic foundational elements. Mathematical and data science knowledge are foundational to understanding how all of this works.”

“There's two sides: the template side and the technical, heavily customised side. To truly tailor AI models to your business, you need someone with a development or programming background.

Stuart Scott,
QA's AWS
Content Director

02

Machine Learning (ML) Expertise

People use AI, machine learning, and deep learning interchangeably, but AI is the umbrella. While foundational to the umbrella, machine learning is a smaller subset of the AI skillset.

Machine learning seeks to teach computers concepts and apply them uniquely to non-identical problems. Software that can do the same thing over and over isn't AI. Software that can use past information and adapt to solve differing problems is AI, and that adaptation is made possible by machine learning.

Currently, tools on the market allow you to build and train machine learning models with no coding experience. However, these pre-built models have limited capabilities. Think of it like a no-code website-building service like Squarespace. They make it easy to build a templated site, but the complex needs of larger organisations are hard to solve in pre-built environments.

Half the skill of building an AI model is knowing what you need to achieve the desired outcome. While templated machine learning tools may be helpful for smaller businesses, large and enterprise organisations will almost always need a deep level of customisation.

When developers have machine learning in their AI skills toolkit, they can help your organisation build models that analyse complex datasets for patterns, positively impacting security, costs, efficiency, logistics, and nearly every aspect of business.

And like with data analysis, understanding machine learning is just one piece of a complete AI skills toolbox.

03

Deep Learning

Deep learning is an even more specific AI skill within machine learning using neural networks, which are algorithms modeled after the human brain. Deep learning can accomplish more complex tasks like describing images and transcribing a conversation into text.

When trained well, neural networks can learn and improve their ability to spot patterns, make predictions, and interpret data over time. **The better you can train neural networks,** the better they will be at dealing with imperfect data and edge cases.



Within deep learning, there are two primary neural network architectures.

- **Convolutional neural networks** process spatial data, like image recognition.
- **Recurrent neural networks** are better suited for analysing data on a timeline or sequence, like text and video.

04

Natural Language Processing (NLP)

Natural language processing is the AI skill powering most mainstream generative applications like ChatGPT. An NLP is built to process commands, even when they use informal, conversational language.

It's the difference between giving a friend instructions and writing a command prompt.

Because of its mainstream adoption, this AI skill has the flashiest and most common use cases. Early instances of NLP were website chatbots that could assist in the customer service process or programs that scanned meeting transcripts for action items.

Then came content generation, which can help write code, create images, and even churn out website copy (but nothing this good).

AI vendors are even publishing programs that allow organisations to train their own models using existing text material. This allows non-technicians to train their own AI specifically suited to their needs and parameters.

"Thanks to ChatGPT, everyone's gone crazy for generative AI. Anyone can use it, but we can really make a difference if we understand this technology better, at a deeper level. Only then can we harness what it can do for us."

Stuart Scott,
QA's AWS
Content Director

05

Computer Vision

Computer vision isn't why you paid for blue light filters on your glasses. Computer vision is when an AI can understand what it sees. This has massive implications, including self-driving cars and cancer detection.

Just like with NLP AI and text, computer vision is an AI skill that requires you to teach your AI model through images using varying object recognition techniques, including:

- **Template matching** teaches an AI to look for new objects based on known objects.
- **Color-based matching** is used when color is the primary object differentiator.
- **Passive recognition** means an algorithm can find an object in an existing image.
- **Active recognition** involves analysing a live image or video feed.
- **Shape-based recognition** is, well, you get it.

Primarily, computer vision involves object detection, object recognition, and object classification. Once an organisation has skilled up to this level of AI deployment, AI training is paramount. Because of computer vision technology's live, real-world applications, developers must have strong AI skills in this area.

06

AI Ethics and Bias Mitigation

As developers approach large-scale applications of AI models, the virtual environments begin to have real-world implications. It's easy to imagine those implications when we talk about self-driving cars, but even how AI is trained to parse data can affect real people's lives, autonomy, safety, and well-being.

We can't assume that an AI will be trustworthy or unbiased. AI is trained on data collected by imperfect humans based on algorithms written by imperfect humans, so it's not automatically accurate, ethical, or unbiased.

And, because these AI models are processing data at a scale most of us cannot comprehend, there is little transparency on how a particular data point will influence the AI's output. That process is a black box for now.

Then there are the more significant questions like:

- Should we be able to create an image of whatever we want?
- Who owns AI-generated content?
- Is the data used to train AI compliant?

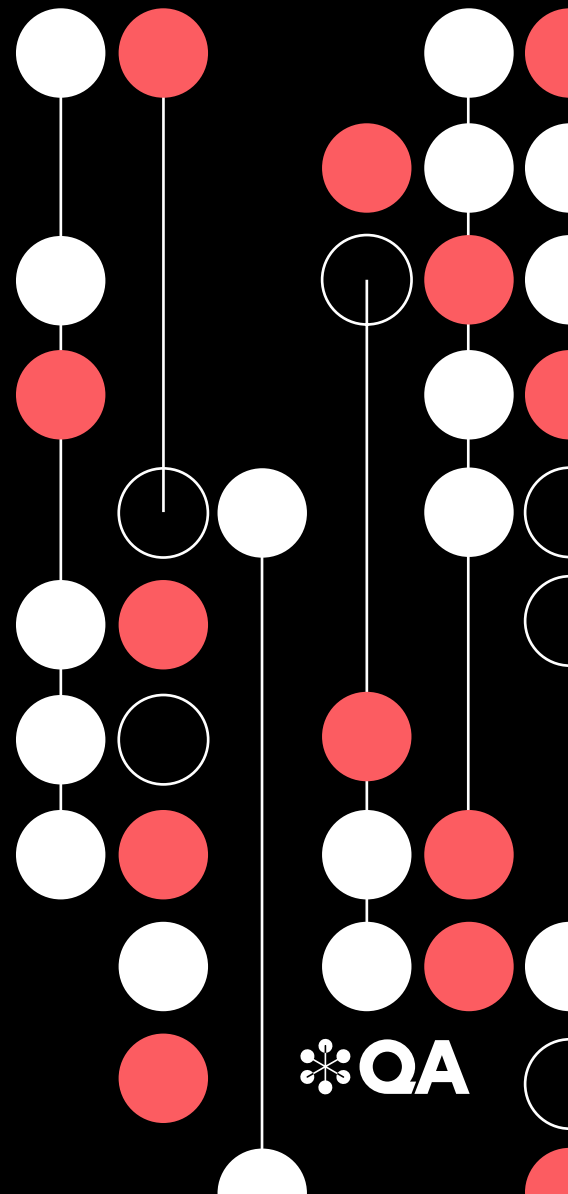
"Ethics in AI is coming up a lot more now, simply because so many people are using it and pushing boundaries. Transparency is a huge piece of it, because people are essentially using data without knowing where it came from."

Stuart Scott,
QA's AWS
Content Director

The power of AI is immense, and **organisations need to consider the more significant ethical implications of its use before deploying and scaling models.**

Researchers at the University of North Carolina, Chapel Hill, found that once data is fed into a large language learning model, it's nearly impossible to delete.

Many companies have already made mistakes as critical as revealing trade secrets and releasing customers' and employees' personal information.



07

Supervised, unsupervised, and reinforcement learning

This trio of AI skills gives developers flexibility in the complexity to which they implement machine learning.

Supervised learning involves manually pointing out things within a dataset that an AI model is processing, commonly known as labeling datasets.

This process may involve less complexity and can give developers more influence in the process.

Unsupervised learning detects patterns in data sets that aren't previously classified or labeled and is great for exploratory data analysis.

In reinforcement learning, developers assign values to specific goals and outcomes, including negative values for undesired outcomes. These values help AI move through the subsequent data in a way that achieves the highest organisational value.

Engineering the AI's learning and interpreting progress can be incredibly nuanced. An AI model is only as good as its training, and its training is only as good as the developer's AI skills.

08

AI Model Deployment

One of the biggest AI skills missing in the current AI landscape is the ability to bring an AI model online and actually use it.

During a 2019 panel at the Transform Conference in San Francisco, Deborah Leff, CTO for data science and AI at IBM, and Chris Chapo, SVP of data and analytics at Gap, discussed the many barriers that keep nearly 1 in 10 AI projects from deployment.

Chapo said: "Oftentimes people imagine a world where we're doing this amazing, fancy, unicorn, sprinkling-pixie-dust sort of AI projects.

The reality is, start simple. And you can actually prove your way into the complexity. That's where we've actually begun to not only show value quicker but also help our businesses who aren't really versed in data to feel comfortable with it."

AI models take a wide range of skills to complete and require specific AI skills to deploy and maintain. To make this happen, your organisation needs someone skilled in software engineering and data science. Luckily, you can find an AI skills training partner to help upskill data scientists to learn tools like:

- TensorFlow Extended (TFX), an end-to-end platform to manage production for machine learning applications.
- Mlflow, an open-source platform for training and managing machine learning models.
- Kubeflow, a platform for deploying machine learning workflows through Kubernetes.

09

Problem-Solving and Critical Thinking

As nuanced as the ethical and futuristic conversations around AI are, as it stands, **AI can only complete the prompts humans enter**, making critical thinking and problem-solving the most essential AI skill of all. Every organisation must have a creative mind when looking at its processes and imagining where AI could offer the most considerable improvement.

The ability of your developers and data scientists to connect AI skills with business outcomes is more critical than the building and deployment.

Any AI undertaking will likely be a big, expensive project. "Doing AI" isn't enough. "Doing AI" results in sunk costs and unused models in deployment purgatory. Training your team to find business-relevant problems that AI can solve is crucial to harnessing the benefits of AI in a way that's valuable to the business and makes the most of its AI and cloud investments.

10

Interdisciplinary Collaboration

To understand how you can best apply AI to your organisation's process, project leaders must deeply understand the workflows and journeys of customers and business users. During the previously mentioned Transform Conference, Leff addressed the difficulties of interdepartmental collaboration when it comes to AI skills:

"This is a big place that holds companies back because they're not used to collaborating in this way. Because when they take those insights, and they flip them over the wall, now you're asking an engineer to rewrite a data science model created by a data scientist. How's that work out, usually?"

Building AI based on assumptions will create a solution in search of a problem rather than an impactful tool for the business.

"Customers know what they want to do, but don't know how the technology fits together to achieve it."

Stuart Scott,
Cloud Academy AWS
Content Director

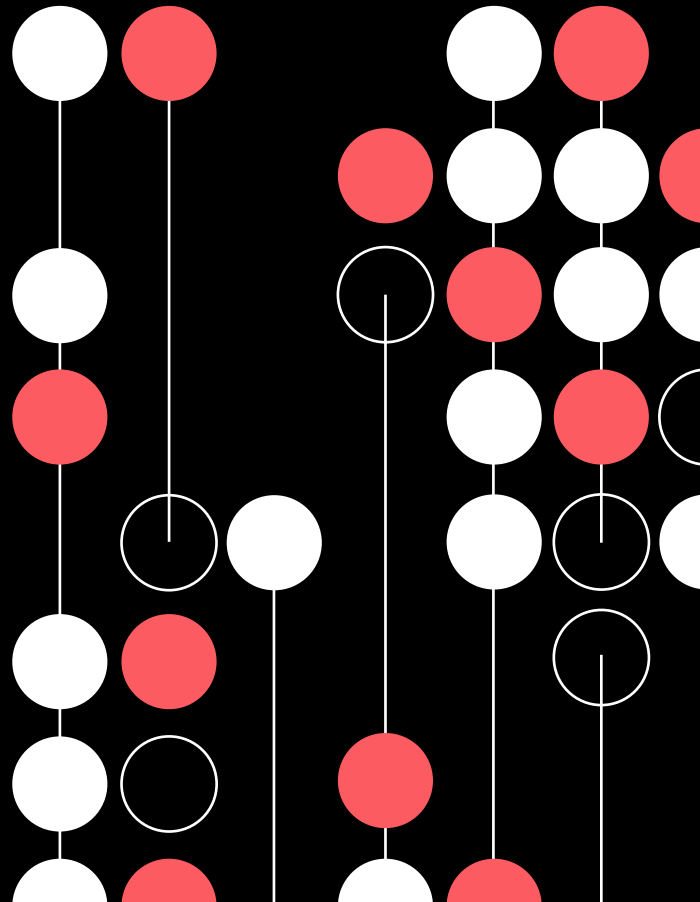


Recognising AI Skill Gaps

Your team likely contains diverse degrees, skill levels, and platform familiarities. Employees with experience in programming, development, data analytics, and business analysis are already on their way to having the AI skills they need to benefit your company. These are great building blocks for an AI team.

But are they ready to start building tools for the business? Maybe, but maybe not... yet. We've addressed some of the first steps your team will need to take in developing their AI skills and your organisation's AI models. However, your first step as the team lead is to benchmark your team's skills and define a vision for where they need to be.

Benchmarking allows you to find strengths and weaknesses before assigning equitable and personalised training programs to bring your entire team up to speed.



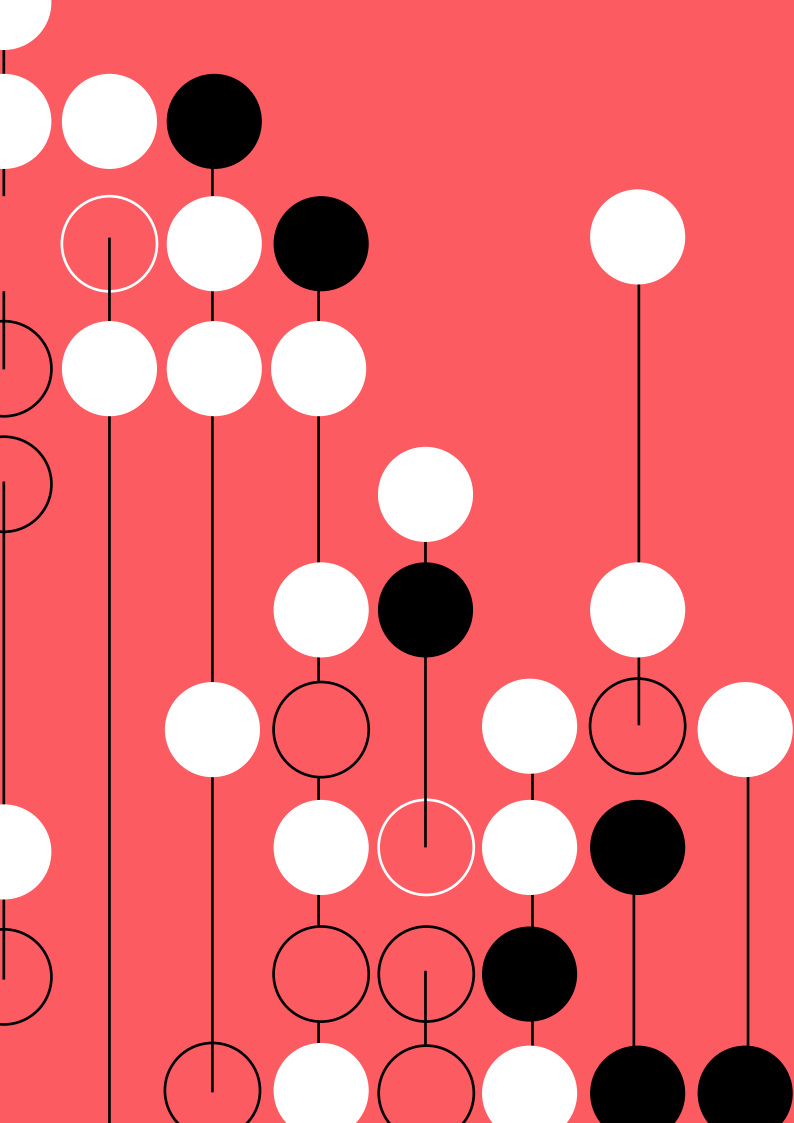
Strategies for Developing AI Skills

We've discussed the most crucial skills to begin your team's AI development capabilities, but now you're probably wondering, "How do we attain those skills?" You can create a training program from scratch, or you can assign team members to go out and find their own training. But these approaches come with a few pitfalls.

Building from scratch takes a huge amount of effort, planning, and cost — not just on the front end, but in perpetuity. The next time a goal emerges, you must create new training material. You must build labs and maintain sandbox environments. You must project manage training initiatives and track learning progress. You must update existing material every time the tech landscape changes. Few organisations have the resources for this.

Having team members DIY their training amounts to a shot in the dark at best. You have no oversight or insight into what they're doing or how well they're doing. Even in the best possible scenario, you'll still suffer gaps in learning that are necessary to fill for your particular goal.

For most organisations, it makes sense to seek out a training partner. But most training platforms take the wrong approach to learning. Your environment and goals are so unique, it's practically impossible to find an out-of-the-box solution that covers the full spectrum of your needs. Plus, solutions that operate largely on the watch-a-video, take-a-test paradigm aren't engaging enough to build the true competencies needed to make your transformation happen.



Conclusion

Building an AI tool for your organisation is no small endeavor, but those who take the time to become truly competent can leverage AI to its fullest extent. You can't expect your team to dive into the deep end immediately.

AI deployment takes time, training, and interdepartmental buy-in. If you start small, training and deploying one or two skills at a time, your team can develop increasingly complex AI models over time.

"Customers know what they want to do, but don't know how the technology fits together to achieve it."

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