

**MIT SMR CONNECTIONS**

STRATEGY GUIDE



# Pinpointing the Problems: Which Ones Are Right for AI?

Part 1 in a series on the journey to AI success.

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ON BEHALF OF:



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This guide is first in a series on AI readiness. Learn more at [sloanreview.mit.edu/SAS-AdoptingAI](https://sloanreview.mit.edu/SAS-AdoptingAI)

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# Pinpointing the Problems: Which Ones Are Right for AI?

**Executives in just about every industry are talking about artificial intelligence** — and those conversations come with plenty of questions. This four-part series of Strategy Guides, produced by SAS and MIT SMR Connections, provides answers, offers advice on overcoming challenges and avoiding pitfalls, and shares expert insights designed to help organizations find the best ways to harness the power of AI. In this first Strategy Guide, you will learn how to identify problems and use cases best suited for AI and how to recognize when AI isn't the right solution.

## Does AI Even Apply?

If you're intrigued by artificial intelligence's potential to transform your business, you're not alone. And if you're not sure exactly where to start, or how to gain the most value from the efforts you've already got underway, you're in good company.

While nearly two-thirds of the more than 2,200 executive respondents to [our recent survey](#) reported increased spending on AI in the previous year, only 5% indicated that they had implemented AI broadly. Even some AI startups use surprisingly little AI: In 2019, fully 40% of 2,830 European AI-related startups used no AI at all, according to research by MMC Ventures, a U.K.-based venture capital firm.

Experts say those findings may reflect a widespread misconception that AI is today's best approach to solving just about any problem. The reality is far more complex.

## Picking the Problems Best Suited to Solving With AI

"A lot of people want the AI hammer so they can whack things," says Michael Wade, professor of innovation and strategy at IMD Business

**"We can show a clear impact:  
The models are helping us retain  
and graduate more students  
successfully. But humans still have  
to act on the model data."**

Pete Smith, chief analytics officer and professor of modern languages,  
University of Texas at Arlington

School in Lausanne, Switzerland. "But it's an expensive hammer, and it takes time, and the right people, to get up to speed. So the first question people have to ask, before they hire people and invest a lot of money, is whether they really need AI — because in many cases, they don't."

AI consultant Ronald van Loon offers similar advice. "You can't throw AI at every problem and expect to gain value from it," says Van Loon, CEO and principal analyst at Intelligent World.

Problems most likely to benefit from AI typically share these characteristics:

**They're rooted in business, rather than technology.** "Typically, the problem you're trying to solve has nothing directly to do with AI. It's a business problem," advises Tom Schneider, executive vice president and chief risk officer for Ford Motor Credit Co. His organization uses AI to assess "credit-invisible consumers" — nontraditional consumers who might still qualify for automobile loans — to approach as potential new Ford customers. The company also relies on AI to predict when a current customer might be ready to trade in an existing vehicle and offer a similar or upgraded model that's available at their dealership.

**They're meaningful and complex enough to justify use of AI.** Problems that are a good match for AI are those that are core to your business, rather than quick fixes or tasks that can easily be completed with existing tools. For example, "there are very effective, simpler tools to solve for operational effectiveness, so this might not be where you want to use AI," Schneider says. "That could be overkill." Along the same lines, manufacturing executives seeking to estimate how much new equipment they need for a planned expansion probably don't need AI for that task, van Loon says: "They can potentially

examine their historical data and spreadsheets and make a valid estimation based on that data instead.”

**At the same time, they’ve got clear boundaries.** “AI is best suited for dealing with situations that are fairly well structured,” says Wade, of IMD. “You’re looking for problems that are somewhat constrained, without too many extraneous factors, where the inputs are relatively controlled.”

**AI and its technological cousins are data-hungry beasts, so the best AI-problem candidates are those with a reliable supply of fodder. But, of course, not just any data will do; AI success requires data that’s accurate, readily available, and relevant to the problem at hand.**

Among the most common use cases, he says, is reading a patient’s medical scan. “It’s well bounded; all the data you need is on that scan. And you’re pretty much looking for ‘yes’ or ‘no’ — for instance, ‘Is there a tumor, yes or no?’” Having learned from many previous cases, an AI system can provide an answer for a new patient.

Similarly, AI is also being used effectively on production lines in the automotive, aviation, apparel, and computer hardware industries, where it can take that same yes-no approach to questions such as “Is this batch of textiles up to the standards we’ve established?” or “Is this part defective?” In addition, banks and credit card companies use AI to detect potential fraud by monitoring customer spending patterns for abnormalities and asking, “Are these transactions legitimate?”

**They’re data rich.** AI and its technological cousins are data-hungry beasts, so the best AI-problem candidates are those with a reliable supply of fodder. For instance, organizations looking to provide contextualized consumer experiences use machine learning to gain insight into customer preferences and behavior from a variety of sources, ranging from purchasing and browsing histories to call-center transcripts to reviews posted on social media and

## AI Defined

**What exactly is AI?** Well, definitions can vary, but the term typically encompasses a variety of technologies, including machine learning, deep learning, computer vision, and natural language processing. That said, if you ask any 10 people for definitions, you may get as many different answers.

For that reason, rather than focusing on specific techniques, IMD Business School professor Michael Wade finds it helpful to identify AI as any computer-based system with the following characteristics:

- **Observation.** “AI can’t just take in data that is given to it; it has to make connections with data that’s relevant to the problems that it’s solving,” he says. In other words, AI must be able to respond to changes it observes in the data it receives, increasing its base of knowledge with new information and insights.
- **Analysis.** “If you have a system where you put something into the input and you always get the same output, that’s typically not AI,” Wade says. “AI has to have the ability in the analysis to consider other things that may impact the transformation from input to output so that it’s not always the same.”
- **Learning.** Wade calls this the single most important aspect. “It goes back to the fact that AI won’t always give you the same output. It learns. It changes the algorithms that it uses. It gets better; it gets more accurate.” ●

websites. But, of course, not just any data will do; AI success requires data that’s accurate, readily available, and relevant to the problem at hand.

**They happen at scale.** No question: AI tends to be costly in terms of money, time, and effort. So it makes the most sense to avoid using it for one-off projects, and instead focus on problems that occur at a scale that makes the investment worthwhile. Typically, this involves decision points or actions that are core to a product or service, occur frequently, are repetitive, or occur at a volume or speed that benefits from analytics augmentation or automation. For example, the University of Texas at Arlington runs a nightly machine learning model to gauge the progress of each of its 60,000-plus students via data in the school’s student information and learning-management systems. The resulting next-day reports provide faculty and advisers

with information for reaching out to individual students who may be struggling — or to praise students who are doing well so that they'll be motivated to keep up the good work.

### Enabling Factors

A successful AI project typically reflects four key enabling factors:

**Strategic alignment:** The project delivers on business priorities. The AI projects most likely to succeed address problems that your organization genuinely cares about solving. For that reason, it's critical to ensure that your AI initiatives clearly align with your organization's overall strategy and goals, rather than operating in a vacuum. As Schneider puts it: "You need alignment across the organization — from strategy to operations — to be successful with AI."

At Mercy, a St. Louis-based health care network of more than 40 hospitals in four states, AI figures prominently in the organization's overall five-year plan, Strategy 2025. "Analytics and automation have

big callouts in that plan, and AI is a big part of that," says Curtis Dudley, Mercy's vice president of data analytics.

The University of Texas at Arlington has a clear strategic plan with defined student-success metrics, and AI and machine learning efforts — including that nightly progress report covering all students — play a critical role in helping the school meet those goals. "We can show a clear impact: The models are helping us retain and graduate more students successfully," says Pete Smith, the school's chief analytics officer and a professor of modern languages, adding one key caveat: "But humans still have to act on the model data."

**People: The project is supported by diverse specialists.** Smith's last point — the role of humans in turning data into meaningful action — is essential to AI success. That begins with ensuring that you have the appropriate mix of technical and business resources and expertise on your staff. As Wade puts it: "Good AI people are hard to find." While AI-specific staffing needs vary from organization to organization, he suggests focusing on three areas: analytics specialists who can build the algorithms, programmers who can code them into the organization's infrastructure, and "people to translate between those first two and the rest of the organization."

**Governance: The project has effective oversight.** Successful AI deployment also requires clear, strong governance that addresses issues such as bias, ethical considerations, and compliance.

It's no secret that data can be inherently biased — and, of course, using biased data will yield biased results. For that reason, it's important to ensure that data used in AI accurately and fairly represents the population in question, and that it's used ethically, without violating confidentiality or privacy. It's equally important to ensure that your organization's use of AI complies with all legal and regulatory requirements.

**Infrastructure: The project is well integrated with operational systems.** Finally, it's important to consider the organization's overall infrastructure. "It's not the sexiest thing, but most people perhaps don't realize how embedded AI is in other systems and processes in an organization," says Wade. "It's not like AI doesn't talk to anything else. It needs stable, reliable, secure IT infrastructure. It needs sources of reliable data. It needs consistency in processes." And that support must extend throughout the entire data value chain, from initial capture through cleaning, analysis, and storage, while also accounting for security and governance. ●

## AI: Hidden in Plain Sight?

**Here's a little secret:** You, or at least your company, may well be using AI without realizing it.

"A lot of conversation is focused on how to build AI from the ground up in an enterprise; that's what people think they need to do. But lots of companies are already using AI," says Monica Livingston, senior director of AI sales at Intel. "They're using it through enterprise software and tools that incorporate AI in all sorts of areas, and they're not even necessarily aware that they're using it."

For example, your HR department probably uses a résumé-scanning app that relies on some form of AI, she says. Sales, customer service, IT operations, accounting, finance, and research and development are among the other functions whose systems may include AI applications.

So, that's a better place to start the AI conversation, Livingston says. "People often say, 'How do I get started with AI?'" Her response: "If your enterprise vendors are building AI into your applications, you might not need to build from scratch." In other words, a trusted, experienced partner can augment and provide the targeted expertise required to deploy AI. In any case, it's an issue worth exploring before breaking out that costly "AI hammer" for enterprise-level initiatives. ●

# CHECKLIST:

## VALIDATING AI USE CASES

Following is a quick checklist for validating your AI use cases.

- [✓] Pick problems that are small yet strategic.** Don't try to pound everything with that high-priced hammer. Instead, start by solving one or two individual problems that clearly contribute to what the organization cares about — and that align with your overall organizational goals and strategy.
- [✓] Establish that AI is the right tool for the job.** Identify problems with characteristics that make them especially promising candidates for solving with AI, such as complexity and controlled inputs. Zero in on those problems that can't be solved with existing tools.
- [✓] Determine AI-specific objectives and metrics for success.** It's important to clearly define your AI project's desired outcomes — such as reducing production defects, improving fraud detection, or identifying potential sales leads — as well as its intended audience or environment, and the metrics for gauging the initiative's success. All are critical for responsibly designing and deploying AI in ways that deliver those desired outcomes safely, fairly, and equitably.
- [✓] List data requirements.** Before launching your AI initiative, ensure that you've identified the kind of data you'll need — and that you have enough of it. "AI requires a lot of data," says Monica Livingston, senior director of AI sales at Intel. "There have been projects we've had to stop because there wasn't sufficient data." It's also important to make sure the needed data assets are clean and easily accessible, an effort that may involve eliminating silos and creating or streamlining data warehouses and data lakes.
- [✓] Identify the resources and expertise needed.** Different use cases require different technologies and techniques and, of course, have different implications for users. AI projects require diverse collaborative teams, so it's important to bring together the right mix of talent for the specific initiative you're undertaking. That includes representation from business, IT, operational technology, and, of course, the data science staff — and, depending on the project, the necessary legal, ethical, and management expertise as well. (Note: Subsequent Strategy Guides will explore this issue in more depth.)
- [✓] Pinpoint potential challenges and pitfalls.** Make note of any regulatory, compliance, or ethical considerations, and even any potential areas of sensitivity, such as confidentiality, for your AI initiatives.

For a webinar based on this Strategy Guide, visit [http://bit.ly/MIT-SMR\\_SAS\\_AdoptAI\\_1](http://bit.ly/MIT-SMR_SAS_AdoptAI_1).



**Gavin Day** oversees technology development in the SAS R&D division. He is responsible for defining and communicating the company's technology vision based on market research and ongoing customer interactions. The technology team includes product management, corporate development, industry solutions, technology governance efforts, SAS's innovation center, and the centers of excellence. Previously, he served as senior vice president of U.S. commercial sales, where he oversaw the financial services, health and life sciences, energy, manufacturing and midmarket business units and the presales and operations teams. He has more than 20 years of experience in sales, consulting, presales, technical support, IT, and operations.



## SPONSOR'S VIEWPOINT

### A Q&A With Gavin Day

**In this Q&A, Gavin Day, senior vice president of technology at SAS, shares real-life examples of AI at work, discusses picking the right problems to solve with AI, dispels a common misconception about AI, and defines AI success.**

*This conversation has been edited for clarity, length, and editorial style.*

#### **Q: Could you describe some especially interesting AI use cases?**

**Day:** Two major truck manufacturers use sensor data and SAS AI solutions to predict maintenance issues and prevent unplanned downtime, which takes a tremendous toll on the fleet operators and customers that are expecting these deliveries. They monitor the data from each truck; if something is wrong with a vehicle's major systems, such as the engine or transmission, they can take it out of service before it breaks down on the road somewhere.

Another customer, a major aerospace manufacturing company, predicts potential failure of airplane parts before they fail. But they're also using it to see where they need to have parts distributed around the world. That's because knowing something is going to fail is one thing — having a part ready and available where these planes are in flight is the second part.

Then there's an organization focused on supporting healthy bee populations. They provide video footage from inside the hives, and the machine learning algorithms decode bee movement so teams can better understand where bees are finding food. This real-time monitoring of bee movement allows beekeepers to establish hives in optimal locations to maintain strong colonies.

One last example is that machine learning and AI are showing great promise in advising analysts when to review and make manual overrides to their forecasts in the financial industry. We're in testing with a large global consumer goods company, and the approach has reduced the number of forecasts needing manual review, which cut analysts' time in half and improved overall forecast accuracy by 6%.

#### **Q: How can organizations pick the right problems to solve with AI?**

**Day:** They need to start with understanding and doing an honest assessment of their AI maturity and skills. If they're just starting out, they need a project that has a limited scope and that will benefit from a single AI capability such as machine learning or conversational AI. If they're advanced in their maturity and have AI skills, they can choose to tackle more complex projects that bring multiple AI technologies together.

Specifically, "next best" recommendation engine capability is becoming required now for marketing and sales. So, that's a place for some organizations to start.

**“Don’t solve a problem you don’t have. Some organizations will read articles about how helpful AI is and then decide to start solving problems that aren’t core to their business. So, you need to make sure — as with the adoption of any technologies, but for AI in particular — that it’s solving a problem you need to solve.”**

**Q: What kinds of problems should organizations avoid tackling with AI?**

**Day:** My initial advice: Don’t solve a problem you don’t have. Some organizations will read articles about how helpful AI is and then decide to start solving problems that aren’t core to their business. So, you need to make sure — as with the adoption of any technologies, but for AI in particular — that it’s solving a problem you need to solve.

**Q: We’re hearing that some companies think they need to build AI from scratch — but, in fact, they may already have AI capability without realizing it. Could you speak to that?**

**Day:** There’s definitely merit to this thought. If an AI application is extremely specialized, then a custom approach is the way to go. But, for the large majority of those types of tasks, we have found incorporating AI capabilities, object recognition, and conversational AI into your existing tools and workflows is the right approach.

There’s often discussion of AI being the bespoke application sitting “over there.” The SAS approach is different. We want AI capabilities in everything we do. We use the saying “Sometimes it’s hidden in plain sight.” The capabilities could already be present in what you have, even if you don’t realize it.

As an example, we have customers using SAS technologies to detect fraudulent transactions in real time. We’re a very common solution in the market, and we’re using machine learning and deep learning to improve fraud detection and find new threats. But sometimes, that capability isn’t transparent or recognizable to our customers.

**Q: What does AI success look like?**

**Day:** As we put technology into the market and it evolves, how do we know that it’s actually solving anything? In my opinion, AI’s real value comes from making better decisions that lead to better business outcomes. If we make better decisions at every level in an organization, from tactical to strategic, and we make those better decisions every single day, that’s a strategic advantage. That’s where I hope the use of AI and analytics continues, with the tide moving toward using both to become smarter companies and make better decisions — not just using technology because it is the latest and greatest thing.

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