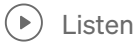


From pilot to maintainable AI technology stack



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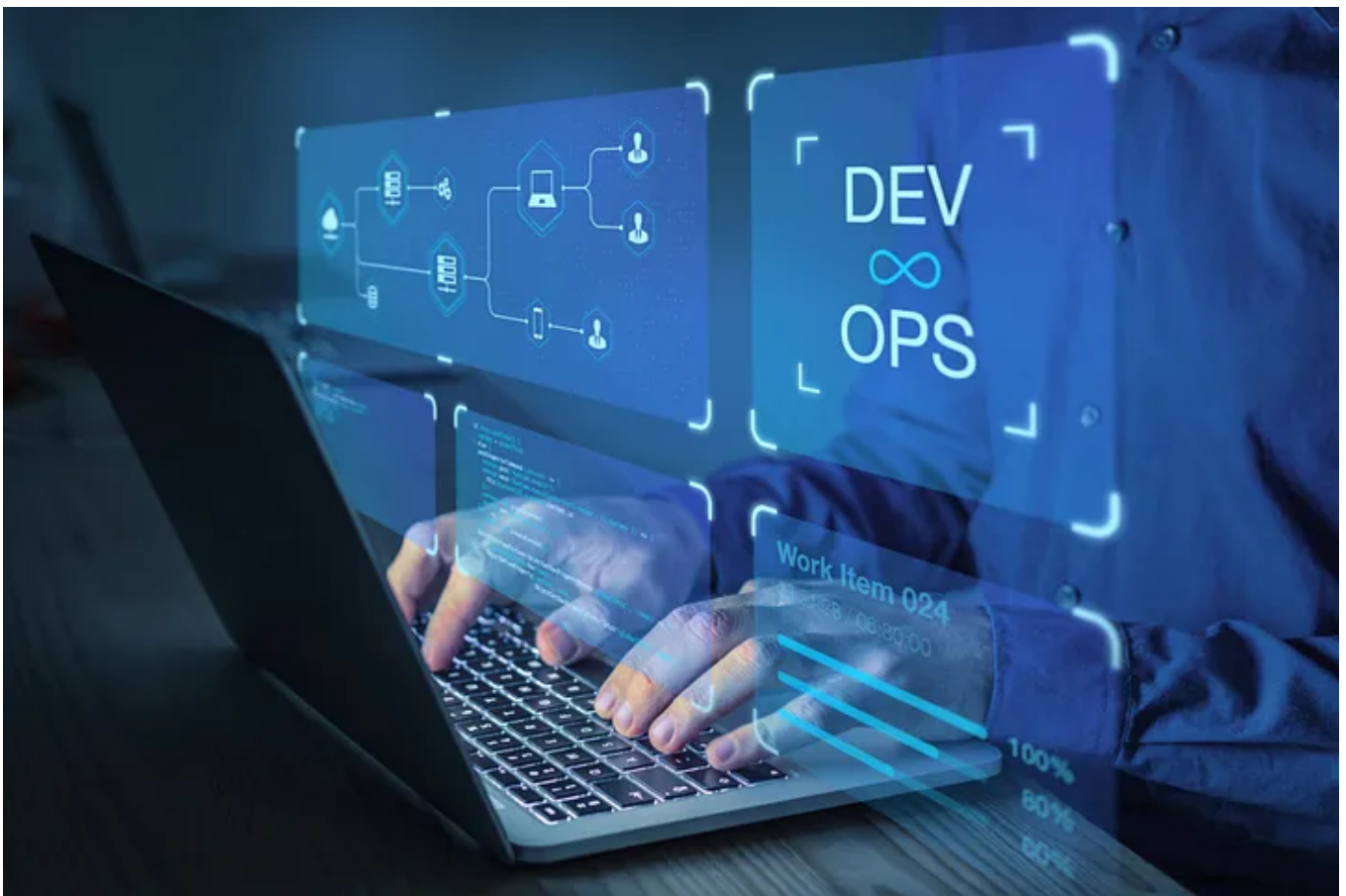


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Only 54 % of artificial intelligence (AI) projects from the pilot phase are deployed in a production system, according to [Gartner 2022](#). This number only increased slightly from 53 % in a previous [report 2020](#). *

What are the reasons for this? What is your guess on that? Let us first review the key findings of the 2022 Gartner report.

Organizations report that they are struggling to get the desired business value from their AI projects. We highlighted the importance of this issue in our [previous article](#).

Interestingly, security and privacy concerns were not seen as a major barrier to adoption, cited by only 3% of executives. Nor was a lack of talent.

The latter is something we see in our own market: When developing AI models, many companies already rely on a mix of in-house developers and external specialists to solve specific problems. This is not surprising, as many of the talents have recognized the possibilities of AI and data-driven jobs, and want to develop their careers in this direction.

In general, two of the biggest adoption issues of industrial AI are the availability of machine-readable data and what we will highlight in our next article: how to get ML into production, i.e. machine learning operations, MLOps.

However, today we're going to look at a different topic: how to manage the multitude of algorithms and projects in a meaningful way. What is your role as a manager in the development of AI models?

Governance of AI models

In the last article, we highlighted the importance of pausing for a moment after getting excited about the first working proof(s) of concept with AI. We compared this to the pause moment in a play.

This deliberate moment of reflection should be used to have the technical specialists explain the technology in detail to you, the business leader. As data scientists, we know this from our daily work: we write code in our sandbox, download tool X or Y, take this new library or test that algorithm. In the end, we put it together, and bam... it works!

For you as an executive, it is now time to understand the developers' design decisions and to question them constructively. This also means that you must be able to understand and evaluate the content of the technology being used. Conversely, technical specialists must be able to explain their content in a way that non-technical people can understand. A simple "explain it to me like I was a 7-year-old" often works miracles!

It also requires a thoughtful approach to knowledge preservation. In our company, maXerial, we have implemented some key points for such governance issues from the very beginning: We store AI models in a systematic way. We also link to the datasets used to train the model. Or we note the exact version numbers of the libraries we use. All with the goal of keeping the models reproducible.

Choose your AI technology stack wisely

In addition, we have established company-specific best practices when choosing our own AI technology stack. What do I mean by that?

We always write our code in Python or C++. Of course, there are many other good languages and tools out there. But whenever possible, we stick to this basic choice, even if it sometimes means rewriting a module. This may mean some additional work or slightly higher costs, but we believe that in the long run we can compensate for this by improving the maintainability of the models by orders of magnitude.

Conversely, we are not closed-minded if something really does not work with the design choices we have made. But then we make the decision consciously and only for the smallest unit needed.

For the AI modelling work, we stick to established frameworks to develop our models. When we chose them, we made sure that the next step was also possible: How easy (or difficult) is it to finally deploy the models in a production environment? By developing a [1-Click AI Trainer](#) for the industrial shop floor, we have shown that we take this goal very seriously.

Focus to build

The third important point we see is the need for focus and scarcity of resources. As a manager, you are often the interface with the customer. Therefore, you always ask yourself: What is the benefit to the customer? Where is the added value?

We have seen that areas of focus emerge. Of course, I can do (almost) anything with AI. But does it make sense? Not every problem is ChatGPT — to put it a bit casually. Some are, but is there a market advantage for your company to solving them?

Our focus areas also allow us to build the necessary depth of content and expertise. For instance, one of our focus areas is the application of AI to industrial image data. We have written our own tools to do AI on 3D data. That doesn't come off the shelf.

As a startup, our resources are limited. That's why we prefer to work on topics that we can reuse. Github is our daily friend. We believe that this allocation of resources is where the industrial manager is needed to provide guidance in any manufacturing environment. Don't leave this work to specialists, even if the technology is new and somewhat obscure.

Executive Summary

There are a number of issues that need to be considered in order to successfully transform the pilot into a maintainable AI technology stack. We have selected three of them and looked at them in more detail:

- 1) Systematic consideration and governance of AI models and datasets
- 2) Choosing a maintainable AI technology stack. Do it wisely.
- 3) Focusing on competence areas and resources to build expertise with real added value for your customers.

Thank you for reading and for your time. We look forward to seeing you again in the seventh and final part of our industrial AI article series.

Further reading

This is the sixth article in our series on industrial artificial intelligence (AI). More articles in this series (list updated on release):

- (1) [How to bring AI to your manufacturing company](#)
- (2) [Get machine-readable data for industrial AI](#)
- (3) [Build sandboxes and let them play](#)
- (4) [What kind of problems can you solve with ML in your company?](#)
- (5) [Your route to success in industrial AI: Think big, start simple](#)
- (6) [From pilot to maintainable AI technology stack](#)
- (7) [What you can learn from your smartphone for industrial AI](#)

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