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# The Ultimate Guide to Building Your Hyperautomation Tech Stack

## How digital transformation opens up new opportunities for software developers

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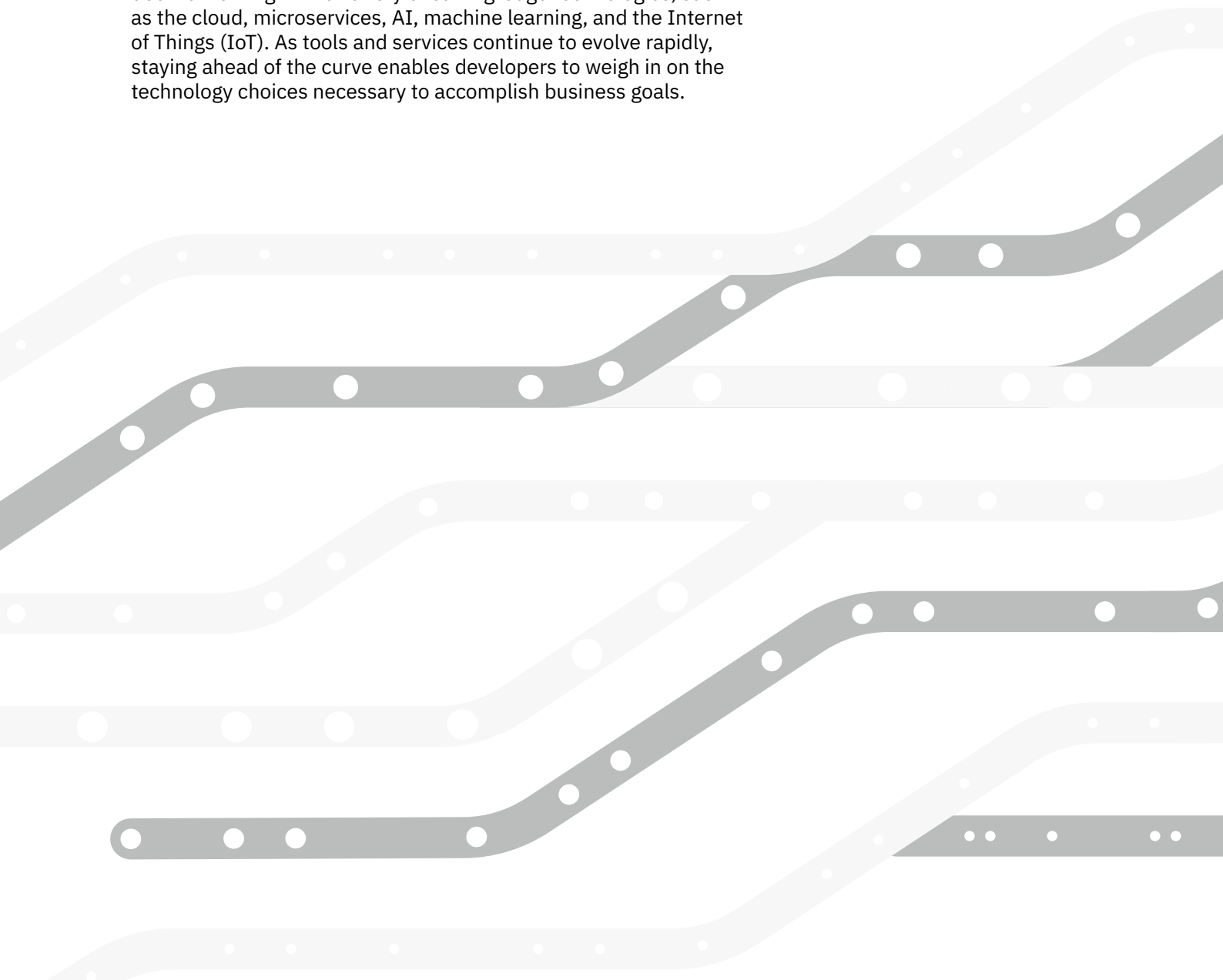
## Contents

# Introduction

Thanks to the impact of digital transformation on organizations in a wide variety of industries, software developers are under immense pressure to deliver innovative automation solutions while minimizing technical debt. Prominent technology industry analyst firm Gartner coined the term “hyperautomation” to describe this phenomenon at a high level. In short, hyperautomation is the business-driven need to automate as many business and IT processes as possible.

Hyperautomation gives skilled developers an incredible opportunity: being central to digital transformation exposes them to a range of business problems and the opportunity to work with new software that can accomplish lofty goals. Digital transformation opens the door to working with a variety of cutting-edge technologies, such as the cloud, microservices, AI, machine learning, and the Internet of Things (IoT). As tools and services continue to evolve rapidly, staying ahead of the curve enables developers to weigh in on the technology choices necessary to accomplish business goals.



## Hyperautomation in the real world

These are some examples of common hyper-automation scenarios that software developers encounter.

### Modernizing legacy systems

While most legacy systems were originally implemented to automate work, they often hinder digital transformation because of outdated architectures, proprietary interfaces, and an inability to scale up to support an increasing volume of digital business. Modernizing legacy systems as part of a hyperautomation initiative can mean replacing those systems with more up-to-date technologies or implementing an infrastructure around those systems that adds flexibility and scalability.

### Replacing homegrown solutions

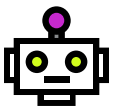
Homegrown software is also often originally implemented to automate work, especially tasks and/or processes highly specific to an organization or industry. Because homegrown software is purpose-built for a limited set of use cases, it can be just as hard—if not harder—to modernize compared to off-the-shelf legacy software. When pursuing digital transformation, many organizations choose to replace homegrown software with horizontal technologies that can be customized in a way that's easier to maintain.

### Implementing microservices

Many software development teams opt to implement a microservices architecture when automating complex processes because of the many benefits microservices offer: flexibility, scalability, fault tolerance, and more. However, the loosely coupled nature of microservices architecture can make it hard to visualize, monitor, troubleshoot, and improve a business process from start to finish. When considering microservices for a hyperautomation initiative, it's also important to consider process automation.

### Automating human work

"Human work" is any task that requires knowledge workers to do something. Common examples are compliance checks, quality assurance tasks, and personalized customer support. While hyperautomation is about automating as much of a business as possible, it doesn't take the place of work that people should or must do. Optimizing automated processes means that knowledge workers are only involved when needed and are provided with the tools and information they need to execute their tasks effectively and efficiently.



### Untangling RPA bots

Robotic process automation (RPA) bots use screen-scraping to simulate mouse and keyboard actions to automate tasks within systems that don't have an API. RPA tools are a popular choice for low-code developers and business technologists who need to automate tasks but who don't have advanced programming skills. While RPA can be a useful solution when dealing with legacy systems, it leads to technical debt because bots offer limited customization options and are prone to breaking. Hyperautomation often involves taking an inventory of existing bots, refactoring them where it makes sense, and replacing them with APIs where possible.

## Hyperautomation challenges

There are three primary challenges that software developers encounter when working on hyperautomation and digital transformation initiatives.

### Business-critical processes are complex

Business-critical processes—the ones that build and sell an organization's products and services—are complex. They involve a variety of tools and technologies, often combine automated tasks with work that must be done by people, and require process logic that goes beyond a simple sequence of steps and basic logic. Additionally, resources are scarce for even the most technically mature companies. Talented software developers with the expertise to automate end-to-end business processes at scale are in high demand.

The pressure to deliver on digital transformation goals while facing a shortage of developers often pushes business stakeholders to implement local automation using point solutions instead of waiting on IT to deliver an end-to-end automated process. When these point solutions can't support complex business processes, developers must maintain and customize them, eroding any value that might have been gained from a "quick win." Any efficiencies gained from local automation are trapped in individual tools or systems and will never scale across the business.

### IT and the business are often disconnected

The business-driven need for automation won't come as a surprise to experienced software developers. However, it's common for IT teams and the business to be misaligned on their understanding of what is required to put hyperautomation into practice and make progress toward digital transformation goals. Research shows that 62% of IT decision-makers and business leaders say that at their organization, IT and business users cannot easily collaborate on individual processes and/or projects, and 82% believe that miscommunication between teams leads to the wrong thing being built and/or rolled out to customers.[1]

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Source: **The 2025 State of Process Orchestration & Automation Report**

Disconnects slow down digital transformation efforts because many different stakeholders are essential to achieving automation success. If there's a lack of alignment around a transformation initiative, it's hard to agree on goals and timelines, select the right automation tools, and ultimately roll out an automated business process from end to end.

1 Source: The 2025 State of Process Orchestration & Automation Report

### Infrastructure and technology limitations limit innovation

The limitations of an organization's infrastructure and technology can lead to a number of hyperautomation challenges. Primarily, technology limitations often force teams to bend their process design to fit the capabilities of the tools they have at hand, instead of implementing automation using best-of-breed solutions and proven best practices.

In addition, automation tools that use a proprietary implementation or design language typically require software developers or low-code developers with specialized skills, which can be hard to find. If you can't hire the right skills, employees will need to learn them, leading to a longer time-to-value for hyperautomation projects.

Proprietary tools also lead to vendor lock-in, putting the organization at the mercy of future price increases. IT leaders often have no appetite for adding more technology to work around lock-in, even if it could help the organization innovate.

Scalability and resilience present additional limitations. As an organization transforms more and more of its business to be digital, its critical processes must be reliable, even as process volumes increase. If the hyperautomation stack can't handle high process throughput or causes outages that tie up resources, you won't be able to stay ahead of the problem. These limitations can prevent you from moving into new markets and affect the IT team's ability to support the business' growth.

## Achieving hyperautomation success

Taking a digital approach to business and looking for new and innovative ways to automate processes brings software developers to the forefront for nearly every business initiative. They're often tasked with translating business goals into what is technically feasible, which can be challenging for projects such as replacing a legacy system or homegrown software.

This is why collaboration between software developers, business users, and all other process stakeholders is essential to scoping the right use cases and selecting the right technologies. Without collaboration, organizations risk business-IT misalignment that results in failed projects and wasted time.

The challenges of hyperautomation and the need for collaboration come with a potential reward. Digital transformation projects give IT teams more freedom to work on interesting projects, solve complex problems creatively, and grow their skillset.

# Designing and implementing processes

Businesses run on processes, so process orchestration and automation are critical capabilities for a hyperautomation tech stack. In fact, 86% of IT decision-makers and business leaders believe that a company cannot have hyperautomation without having process orchestration.[2] Automating business processes starts with design and implementation tools that prioritize collaboration.

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Source: **The 2025 State of Process Orchestration & Automation Report**

## Designing processes and decisions

When designing business processes and automated decisions (also known as business rules), collaboration between IT and the business is critical. This collaboration might start with establishing business goals and choosing tools for a hyperautomation tech stack. However, it doesn't stop there; collaboration is important throughout the process lifecycle, from design to implementation to improvement. When you look for tools to help design business processes and automated decisions, prioritize collaboration features.

The Business Process Management and Notation (BPMN) standard is a common language that software developers and business stakeholders can use to design processes collaboratively that a workflow engine can execute. With BPMN, what you see is what you run—there's no translation between design documents and code that developers write.

Similarly, the Decision Model and Notation (DMN) standard enables collaboration on automated decisions. With DMN, both software developers and business technologists can encode business rules in decision tables executed within processes. DMN tables can easily be updated and deployed without changing the business process that invokes them.

Because they're open standards based on XML, BPMN and DMN are portable. You can move BPMN and DMN files between design tools, and even view their source code in any integrated development environment (IDE).

### What to look for in a process and decision design tool:

- Native support for BPMN and DMN to act as a common language for IT and the business
- Version control features with the ability to set milestones and compare versions
- Collaboration features such as commenting and sharing

2 Source: The 2025 State of Process Orchestration & Automation Report

## Designing user interfaces

Even in the age of hyperautomation, business processes often require some amount of human work; for example, many banks require a manual review of all loan applications for regulatory compliance and fraud prevention reasons. For software developers, the important thing about human work is that it requires the development of a user-facing front-end application, seamless integration with existing user-facing applications—or both, depending on the complexity and scope of the process.

When an existing application is in place, you'll often be faced with the challenge of integrating newly automated processes without drastically changing the UI that people have been trained to use. In this case, you need a process automation tool that provides an extensive API for human tasks to enable the application to retrieve pending tasks, present them to the user, allow task assignment and reassignment, collect data from completed tasks, and so on.

When a new user-facing application needs to be developed, a low-code application development platform (LCAP) can help free up developers' time and give business stakeholders a hands-on role in building the app. LCAPs enable low-code and citizen developers to build simple front-end applications that can hook into automated business processes. However, while LCAPs can empower people in the business, it's important to ensure that the apps they build are properly tested and deployed.

### What to look for when designing user interfaces:

- A process orchestration tool with an extensive API for human task management
- A single operational view of business processes that involve both automated and human work
- An LCAP that offers automated testing and deployment capabilities or that can connect to an existing CI/CD pipeline

# Testing and deploying processes

## Process simulation

Process simulation is a powerful technique for designers to verify that a process works as it should. Simulation enables teams to:

- Visualize how tasks flow through the process from start to finish
- Understand how different input data might affect the process flow
- Ensure a technical failure in another service or system won't hinder the process unnecessarily
- Discover opportunities to replace manual work with automated tasks

Business users, in particular, benefit from a process simulation tool that doesn't require technical skills to spin up a simulation environment, deploy a process to it, and experiment with the process by taking actions such as changing variable values and simulating errors.

### What to look for in a process simulation tool:

- Automated setup and teardown of simulation environments
- Features for adjusting aspects of a process in the simulation
- Detailed output when a simulated process fails or behaves in an unexpected way

## Hyperautomation and AI

Artificial intelligence (AI) and machine learning (ML) offer a wide variety of possibilities for enhancing hyperautomation. Here are just a few.

**AI-powered copilots** help boost productivity for business and IT users by intelligently suggesting actions they can take when building processes. A copilot provides a fast track to orchestrated processes by speeding up the design phase and providing immediate feedback to users, preventing process design errors that might otherwise only be detected in production.

**Intelligent processes** help teams get the most out of AI/ML tools and services by providing the toolset to orchestrate them in the same way as other process endpoints (including human work). In particular, intelligent processes enable teams to orchestrate generative and predictive AI functionality in a combined process. Operationalizing AI in this way helps organizations build critical governance for the use of AI and data.

**Autonomous AI** combines automation with AI-powered agents that can act proactively and autonomously to achieve business goals. Autonomous AI can uncover hidden value in an organization's most critical end-to-end business processes by identifying opportunities for increased automation and driving continuous improvement of automated processes.

**Learn More**

## Automated testing

Automated testing is critical in modern software development because it greatly reduces the time and effort needed to run tests and enforces consistency in what is tested and when.

There are many types of automated testing:

- **Unit tests** are very close to the application's source and often run locally on a developer's machine or a continuous integration server. They test individual functions of the classes, components, or modules used by your software.
- **End-to-end tests** replicate user behavior in a complete application environment to verify that various user flows work as designed.
- **Regression tests** are run repeatedly after application code is changed to ensure that the changes haven't introduced new bugs or broken existing functionality.
- **Performance tests** measure an application's reliability, speed, scalability, and responsiveness. The tests determine if the application meets performance requirements. They also help teams locate bottlenecks and calculate stability under peak load.
- **User interface testing** covers the aspects of software that a user will interact with to ensure usability. The tests focus on verifying the functionality and performance of visual elements against requirements.

You likely have several automated testing tools in your tech stack, depending on the type of software you typically build and the programming languages you often use. Hyperautomation initiatives might require you to explore new types of tests and testing tools. For example, if citizen developers are building front-end applications using an LCAP solution, you'll need to look at ways to test those applications.

### What to look for when automating tests:

- A process and decision modeling tool that uses open standards to make writing and reusing tests easier
- A process automation tool that allows custom code to be written in any programming language so you can use existing test tools
- A process automation platform that can hook into your existing test pipelines

# Automating and managing processes

Research shows that organizations average about 50 endpoints required for business processes, which has grown by 19% between 2020 and 2025. In fact, 85% of IT decision-makers and business leaders say the volume and diversity of endpoints used in their organization is increasing exponentially.[3]

Ensuring all endpoints are correctly integrated into business processes isn't easy. It comes down to task automation, which uses technology to perform work automatically without human intervention. However, automating a specific task, or even a series of tasks, will not give you a view into the end-to-end process flow. You need process orchestration to achieve this type of control and visibility.

## Process orchestration and automation

Process orchestration coordinates the people, systems, and devices required to automate a business process from start to finish. It can even tie multiple processes together. Process orchestration helps IT teams work with a wide variety of tools and technologies while achieving even the most ambitious goals around digital transformation.

Task automation, process orchestration, and process automation are related:

- **Task automation** is the use of technology to automatically perform tasks without human intervention.
- **Process orchestration** is the coordination of both automated and manual tasks that make up a business process.
- **Process automation** describes using a mix of process orchestration and task automation to automate a process, where the degree of automation can vary.

When you combine task automation with process orchestration, you can achieve process automation. The right process orchestration solution enables teams to automate processes today and innovate tomorrow by adjusting process design and swapping out different hyperautomation tools. That's why choosing technologies that address current business problems and can grow and scale as business needs change is critical.

### What to look for in a process orchestration and automation solution:

- A platform that offers pre-built connectors, extensive APIs, and multilingual SDKs to support integration with different systems
- A composable approach that will allow you to swap out tools and technologies as business needs change and as you identify potential efficiency gains
- Process design standards that will enable you to port assets such as process models and application code to another platform if needed

3 Source: The 2025 State of Process Orchestration & Automation Report

## Task automation

Task automation, also known as local automation, is the use of software to automatically perform certain tasks without human intervention. Task automation is needed to automate the many individual tasks that make up an end-to-end business process.

**Point solutions** automate a specific type of task. For example, many tools on the market that can automatically execute business tasks, such as:

- Sending a welcome email to a user who signs up for a service
- Routing customer help requests to the right support team
- Adjusting retail stock levels in real time after a sale occurs
- Approving employees' expenses based on company policy

**Robotic process automation (RPA) tools** implement a specialized type of task automation: they use screen-scraping to simulate mouse and keyboard actions in order to automate tasks within legacy systems that don't have an API. RPA tools are a popular choice for low-code developers and business technologists who own processes that require legacy systems. Typical use cases for RPA processes that require interaction with mainframe systems and document-driven processes such as invoice processing.

**Intelligent document processing (IDP) tools** help automate document-heavy business processes. They use technologies such as optical character recognition (OCR), natural language processing (NLP), and machine learning (ML) to extract, classify, and process data from unstructured or semi-structured documents. IDP goes beyond basic document handling by understanding the context of a document. When combined with the context of a business process, IDP is a powerful capability. IDP is often used to automate the processing of invoices, loan applications, insurance claims, medical records, and legal documents.

### What to look for in task automation tools:

- A focus on delivering fast, reliable task execution without feature bloat
- APIs that enable an automated business process to call the tool when needed
- AI/ML features that enhance task execution within your organization's guardrails

### Humans in the loop

Long-running business processes often require both manual and automated work to create a unified, end-to-end workflow. For example, loan origination, insurance claim processing, and many legal processes usually require specially trained staff and often take weeks or months to complete.

When automating business processes involving people, you need the ability to orchestrate their work in the same way you would orchestrate automated tasks. As mentioned above, you need a process automation tool that provides an API for human tasks to enable the application to retrieve pending tasks and present them to the user. You also need access to performance analytics that will help business stakeholders address inefficient workflows and identify opportunities for task automation.

## Analyzing and improving processes

Hyperautomation is about the business-driven need to automate processes, but it doesn't stop there; to fully benefit from hyperautomation, organizations need a variety of analytics that help both IT and business teams understand process performance and find ways to continually improve.

There are many types of process analytics to consider:

- **Process performance analytics** such as process duration, P75 and P99 duration, and the percentage of SLAs that were met
- **Process branch analytics** that show which parts of a process are likely to be executed and which branches might lead to dead ends or suboptimal customer experiences
- **Task performance analytics** that enable teams to drill down into individual tasks that might be degrading overall process performance
- **Human task analytics** that highlight user tasks that generate the highest effort or cause the most operational friction for employees

### What to look for when humans are in the loop:

- A process orchestrator with an extensive API for human task management
- Data management that will ensure people have what they need to perform their tasks
- Process performance reports that highlight bottlenecks caused by manual work

### What to look for in a process analytics tool:

- Data visualizations that present data in the context of business processes
- Branch and task analysis that helps drive continuous improvement of process design
- Human task analysis that highlights opportunities for enhanced automation

The most effective tools present data in the context of a business process that was executed; this is an important difference between business process analysis and the types of application performance monitoring tools you might be accustomed to using as a software developer.

Identifying bottlenecks is a critical part of business process analysis. Look for a heatmap visualization that aggregates performance across all process instance executions so that

business teams can immediately see where the most impactful improvements can be made. For example, reducing the execution time for an automated task from one second to 500 milliseconds might not impact customer experience much, but automating a money transfer that could previously only be done by a loan officer during bank operating hours could provide a competitive edge.

An effective process analysis tool will also highlight patterns and outliers. For example, an analysis that correlates slow-performing tasks with external factors—such as longer processing times when a credit check involves a specific bureau—can help identify targeted process improvements that can be driven by the IT department, a business division, or both, working together.

## Conclusion

The need for a hyperautomation tech stack that supports a business' digital transformation goals is clear. Businesses run on processes, so process orchestration and automation are critical capabilities for the tech stack. This is a challenge and an opportunity for software developers to compose a stack that supports business goals and is future-proof for whatever comes next. With the right hyperautomation stack, you can overcome challenges and achieve lasting digital transformation success.

## About Camunda

Camunda enables organizations to orchestrate and automate processes across people, systems, and devices to continuously overcome complexity, increase efficiency, and fully operationalize AI. Built for business and IT, Camunda's leading orchestration and automation platform executes any process at the required speed and scale to remain competitive without compromising security, governance, or innovation. Over 700 companies across all industries, including Atlassian, ING, and Vodafone, trust Camunda with the design, orchestration, automation, and improvement of their business-critical processes to accelerate digital transformation. To learn more, visit **camunda.com**.