

Everything-as-Code:

The Unprecedented Innovation Potential of Cloud-Native Software Development



Including
Customer Stories
of Mendix and
Covestro

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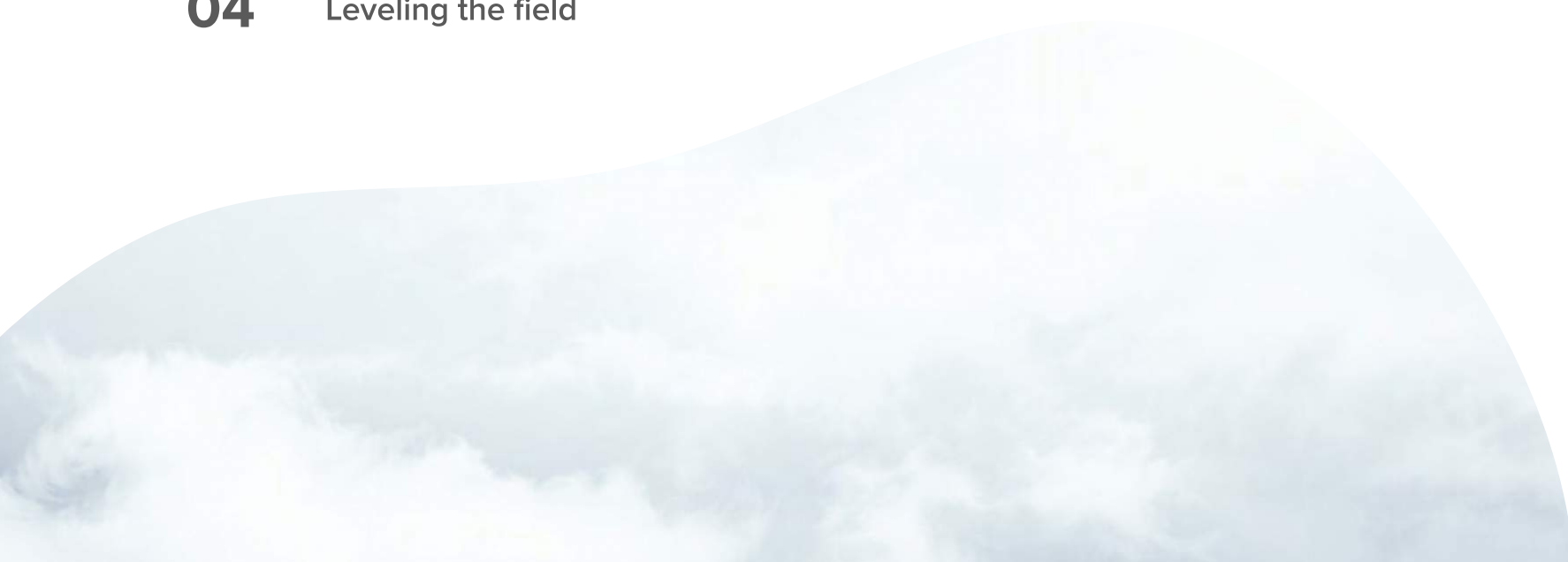
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About the Authors

Very few projects do not involve the cloud, requiring expertise in both software development and cloud engineering. To better understand how these roles overlap and gain insight into how they will evolve, three experts:

Luca Cavallin and **Maarten Baijs**, Binx cloud engineers, and **Léon Rodenburg**, Xebia software consultant/Alibaba Cloud MVP, share their thoughts.



Luca Cavallin - Cloud Consultant

Luca is a software engineer and a certified Product Owner with full-stack experience ranging from large-scale distributed systems to cross-platform apps, and a fan of maintainable software and automated tests. He believes the cloud helps building applications painlessly, so he decided to dive deep into the atmospheric world of Google Cloud. He is currently interested in Serverless architectures, Machine Learning, IoT, React Native, Golang and Rust.



Maarten Baijs - Cloud Engineer

Maarten Baijs is a full-stack cloud consultant with a background in software engineering. Maarten holds four GCP certificates (Professional Data Engineer, Professional Cloud Developer, Professional Security engineer, Professional Cloud Architect).



Léon Rodenburg - Alibaba Cloud Specialist

Léon is a software development consultant at Xebia and a big fan of new technology. In his daily work, he helps organizations get the most out of their development teams by challenging the known and uncovering the unknown.

With a background in Chinese linguistics, Léon is also known for his frequent travels to China and a general fascination for Chinese IT.

What Is Cloud-Native Software Development?

“Cloud-native software development means that you start a software project directly in the cloud, so you utilize one or more cloud providers to their fullest extent,” Léon explains. Rather than creating from scratch, companies leverage the infrastructure and services provided by the cloud. Developers may then start a project by writing and refining business logic and integrating different data sources, rather than creating the base infrastructure for their application.

The benefits offered by this approach are more than an expedited workflow. “Cloud-native development is all about improving quality and reducing risk,” says Maarten, because you can leverage products and services of hyperscalers, like Google, Amazon, Alibaba, Tencent or Microsoft. These services allow you to make powerful, scalable applications that you probably wouldn't be able to create on your own. Essentially, the cloud provider's extensive team of engineers and developers supports clients by continually releasing new services and revising and improving existing services and applications. In this way, anyone can innovate at nearly the same pace as the hyperscalers.

This form of remote support is even more pronounced when using serverless technology. Luca describes this dynamic, “If you are using serverless technologies, you are offloading most of the infrastructure work to the cloud platform's own engineers. The advantage is partly being able to focus on what matters in your business, and partly getting access to cutting edge technology.” Developers then have access to technology they do not have to create or maintain, enabling them to apply their skills in other ways.

Serverless technology is a misleading term because it implies that there are no servers. That is not the case. Instead, serverless computing means that a cloud provider offers server space on-demand, maintaining and storing servers on behalf of their clients. Léon explains the advantages of this model, “There's endless scalability because the complete computer with all the software and the operating system is abstracted for you. The only thing you give is a piece of code to be executed in the cloud.”

Software Development Versus Cloud Engineering

The two distinct roles, software developers and cloud engineers, are gradually merging as the cloud becomes more prominent. With so much infrastructure already provided in the cloud, company's needs are changing. Léon describes the impact he's observed in his clients, "It used to be the case that there was a platform team responsible for the cloud and there was another team that built the software, the two were totally split. I don't see a lot of customers still adhering to that approach because it doesn't take full advantage of cloud development. Mixed teams are becoming more common because clients don't need to address the underlying infrastructure as much."

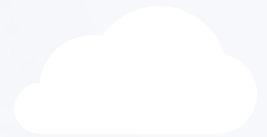
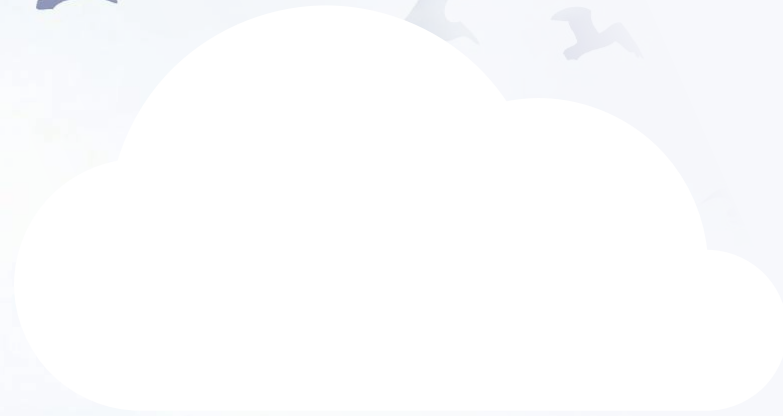
Companies, and the field at-large, are still adjusting to these new possibilities. "At the moment, a lot of these technologies and patterns are very new, like serverless operations," Maarten explains, "so there still isn't much knowledge around these applications in the field. That's why there's still a big need for cloud engineers." How the roles will evolve and merge is not yet clear.

This lack of clarity is partly caused by the different knowledge required. "It is very important that people who work as cloud consultants have some sort of certification to demonstrate their knowledge because the field is still relatively new," Luca says. Different cloud providers offer certification programs, enabling professionals to show their skills meet that provider's standards.



Implementation Obstacles

Theoretically, any company can reap the benefits of cloud-native software development. However, services and applications offered vary between cloud providers, presenting limitations and logistical issues. If one cloud provider cannot meet all of a company's needs, it can be difficult to navigate operating within multiple providers or migrating applications from one provider to another. Léon anticipates this situation will change, "I have a feeling at some point there will be such a big demand from the market to create more tools to move between cloud providers. On a higher level, there might be a standard coming for serverless technology, like an open application framework, that will standardize the way you can deploy services and applications across clouds."



Leveling the Field

Cloud-native software development levels the field by enabling companies to operate with the same resources. In other words, companies have the same toolbox. One significant benefit, Maarten explains, is that companies do not need to hire as many experts, “If you can leverage the services that have been tested and refined for a reasonable price, that will save you money in the end. If you don't have access to the cloud, you have to make everything yourself, which requires a lot of experts. Using the cloud gives companies that only have a few engineers access to world-class technology.” A small team using the cloud may then be as effective as a large team doing everything from scratch.

It is essential to think long-term when considering whether or not to adopt cloud-native operations. Luca has observed that some companies are deterred by the costs associated with cloud providers. He advises these companies to see the bigger picture, “If you don't go to the cloud, you will need to hire experts that know how to build the infrastructure, maintain it, and buy your own servers, which will be even higher costs over time.”



Innovative Distribution Channel Turns Excess Stock into Revenue

Leading polymer and high-performance plastics producer, Covestro saw an opportunity to innovate the way they bring products to the market. With excess stock being a challenge for them and many others in this market, the company aimed to turn excesses into revenue through a unique distribution concept. Xebia, together with Binx.io, helped Asellion improve response time, scale the platform, and connect directly to the Chinese market. Today, Asellion is a successful global distribution channel.



“In considering options, we looked at alternatives, for example hosting in free trade zones like Hong Kong using AWS. However, running directly in China turned out to be the best option. To do so, we set up an additional legal entity and applied for an ICP license.”

– Léon Rodenburg

The Challenge - Innovating Distribution

In 2016, Covestro started to explore ways to 'use' excess materials. Asking customers for input and applying design thinking principles led them to launch the prototype of Asellion, named Select. A low-effort high-value business that is not focused on tailor-made produce but merely making materials readily available. This highly innovative distribution channel is unique, as it enables users to:

- *sell a new kind of produce – surplus stock*
- *in a new way – directly instead of via a partner*
- *to a new customer group – buying small batches instead of bulk*
- *on a new scale – global instead of regional.*

In the following two years, the company scaled and rebuilt the platform (using Ruby on Rails, Java EE, and CI/CD) with a new architecture to increase capabilities and weekly deployments. However, Covestro had little experience in this field and asked Xebia and Binx.io to support and accelerate development using cloud technology.

The Solution - Prepare for Growth and Global Expansion

Covestro's ask was two-fold. On the one hand, the company wanted Binx.io to implement a scalable infrastructure for the platform. On the other hand, the platform needed to become available in China.

To prepare for global expansion, a mixed team of Xebia and Binx.io consultants – Peter Klijn, Edze Knol, and Dennis Vink– laid the foundation. Together, they improved coding standards, shared knowledge about software development best practices, set up automated pipelines for applying infrastructure changes, and made the European platform scalable, highly available, and ready to move to China. The Chinese market is important to Covestro, and Asellion having a direct link to China was crucial. Together with Xebia, the company gained access to this market by adding an Alibaba extension to the existing AWS platform.

Alibaba Cloud

The obvious expert to see this job through to completion was Xebia's Léon Rodenburg – the only Alibaba Cloud MVP in the Benelux. Léon shortened the website's response time – which was several minutes for some pages – by setting up Alibaba Cloud as a separate instance for Chinese customers, parallel to the existing AWS infrastructure, also developed by Binx.io. Data generated by this specific part of the platform runs through the backbone of Alibaba Cloud in Frankfurt to Covestro's SAP in Leverkusen, where its headquarters is located. Doing this enabled both platform instances in Europe and China to share transactions while still ensuring that all customer information is stored in each locality per local regulations.





“If a long-term strategic partner requires a specific material, we naturally prefer face-to-face contact over the platform.”

– Thorsten Lampe, CEO Asellion

Diversifying the Customer Base

Asellion’s users are mainly small and mid-sized businesses, offering high-end coatings, plastics, foams, automotive products, and lighting. The Chinese market consists of many smaller producers, who can now use Asellion to sell directly to a global customer base instead of via a distributor.

As an online distribution channel, Asellion does not aim to replace strategic relationships, but rather provide a wider audience access to Covestro’s products, at the best prices for their industry.

The results - A Team-Based Software Development Process

Xebia and Binx.io both helped Covestro with Agile coaching, user-story-driven product development, and enabled them to scale into China (where most of Asellion’s users are located) through cloud-(native) engineering, the development of critical features, and acceleration of the software delivery process.

Thorsten adds: *“Our product development needed a boost. We were stuck in the process and moving slower than desired. Xebia and Binx.io’s skills gave us the confidence to partner with them. They introduced a software development process that is more visible, controllable, and based on a team approach.”*

As the platform evolves, Xebia is still here to help. From a brief chat over coffee to getting a consultant involved full-time. Especially with regards to entering the Chinese market and helping us with AWS, the consultants’ capabilities and attitude – a mix of problem solving and persistence -were of great value.”

A Globally Scalable and Feature-Rich e-Commerce Platform

In just four months, Xebia and Binx.io helped Asellion develop into a globally scalable and feature-rich e-commerce platform. The platform’s response time significantly decreased from several minutes to a few seconds. Both in Europe and China, the architecture is completely automated with Infrastructure-as-Code, so no manual work is needed. Moreover, the platform’s scalability and high availability ensure Asellion can continue growing and expanding its business worldwide. Today, Covestro has reached 75% of its transaction target, with 600 active, mostly recurring customers.

Bringing Mendix's Low-Code Platform to the Chinese Market

Mendix' North Star is to have as many Makers creating and running apps. This is why Mendix offers very economical deployment options, enhancing Low Code with Low Ops. Servicing makers in China meant making a specific Mendix Cloud available on local infrastructure. Xebia and Binx, proudly part of Xebia, were asked to take a leading role in the development of the Mendix Cloud, based on Tencent's cloud platform.



The Challenge - Making the Plan

Expanding its services to the Chinese market presented Mendix with both technical and cultural challenges. When exploring the options to bring its platform to China, Mendix discovered that it would be best to work with a local cloud platform partner.

Smeets: *“It would take more time to bring our entire platform to AWS China than to Alibaba Cloud.” Additionally, in China, speed is way more important than ‘first time right.’ “We needed to enter the market as quickly as possible, gain market share, and then iterate on the service.”*

“This approach suits the company well, but at the same time, moving a huge platform built on fifteen years of experience within a concise time frame is challenging nonetheless.

“We needed to take it step-by-step, and the first step was the on-premise deployment of a Mendix app based on Kubernetes, which has been on the market since March 2020.”

The next step was to bring Mendix’s platform to China by adding capabilities one by one.

Smeets: *“One of our capabilities is a global marketplace where partners can publish their integrations. Due to regulatory concerns, providing Chinese customers access to this marketplace content requires more than a lift and shift.”*

The Solution - Joining Forces With Xebia and Binx.io

“We initially came into contact with Xebia and Binx.io through my network,” Smeets starts. “Also, we had attended a China seminar by Léon Rodenburg (senior consultant at Xebia Software Development and Alibaba Cloud MVP) in the past. We exchanged some ideas back then, but now it was time to bring what we discussed into practice.” Mendix asked Xebia and Binx.io for help on three levels: technology, culture, and communication. “China is far away, we are dealing with different technology, and we needed to set up a local team with many self-managing capabilities,” Smeets elaborates.

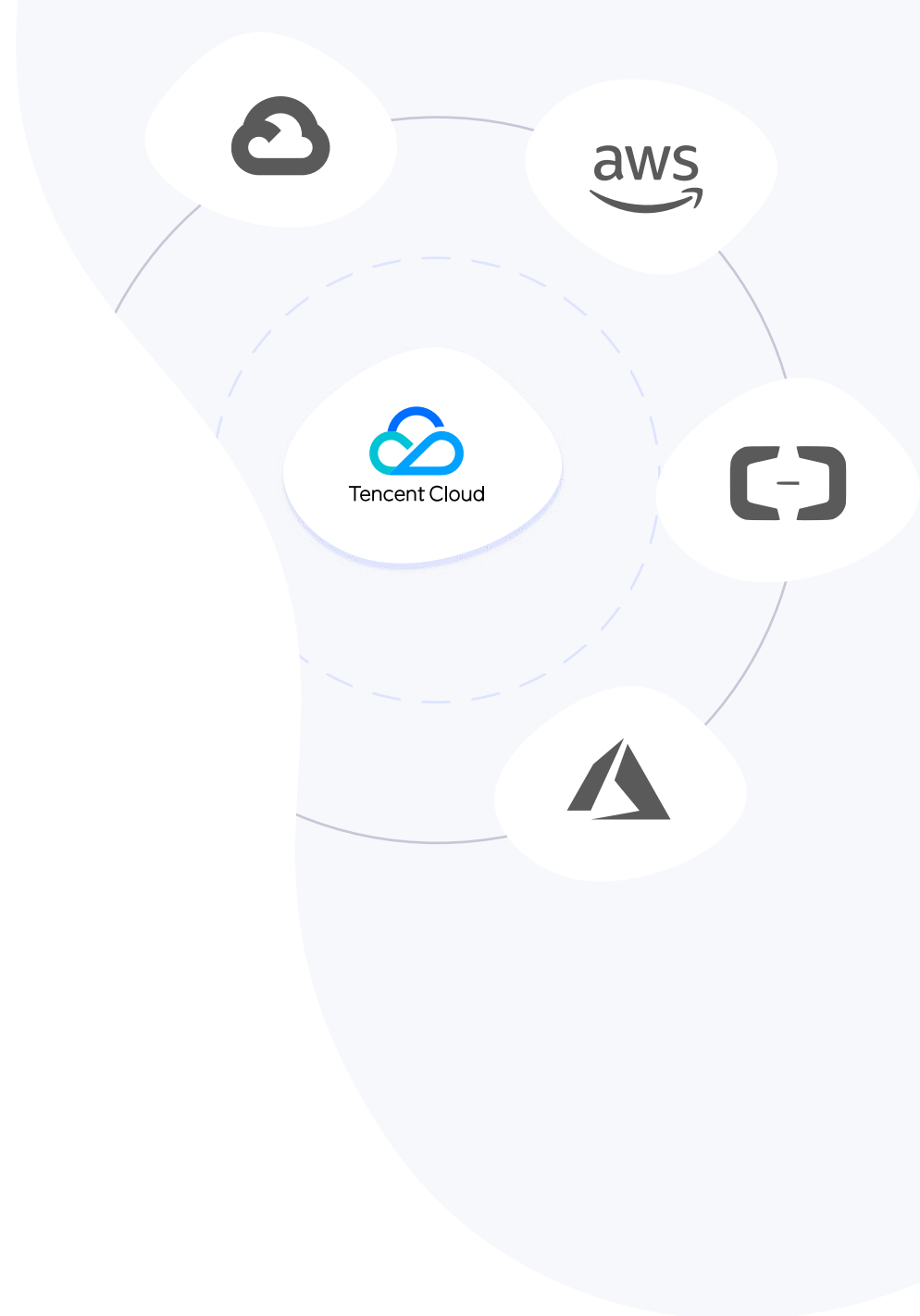
Selecting the Best Cloud Platform

Initially, Léon worked out the scenario on Alibaba Cloud to provide Mendix with more insight on what bringing the platform to Shanghai would entail. There were some issues, but they were overseeable and solvable. However, Mendix China ultimately decided to collaborate with Tencent instead. Smeets: “Although initially, the technical fit with Alibaba Cloud is a bit stronger, Tencent showed a strong willingness to jointly address B2B. Most importantly, the company did not have its own low-code platform proposition. With Tencent, we entered into a partnership that is beneficial to us both.” To support Mendix in their decision, Léon carried out a technical POC and provided a list of things that had to be arranged on Tencent’s side. Smeets: “I presented this list to Tencent as a list of requirements, and a few weeks later, they were all fixed.”

The Added Value of Xebia & Binx.io

“Léon speaks Chinese, knows the culture, is technically well versed, and has great communication talents,” Smeets says. “Now we can’t travel, his skills are proving to be exceptionally instrumental in bridging the distance gap.” Mendix also set up a team of six people in Chengdu. “The team understands Kubernetes like no other, but Mendix was new to them. Léon contributed enormously in sharing expertise and encouraging autonomy within the newly minted team in China.”

Two other consultants helped Mendix with software engineering and platforming challenges. Jeroen Rosenberg, a senior consultant at Xebia Software Development, joined Mendix’s Identity Services team to help accelerate its development. As a core product for everything related to authentication and authorization, re-platforming Mendix’s identity provider to be suitable for migration into China was a large task. At the same time, it still needed to adhere to the highest security standards and ensure full isolation for European and Chinese customer data. Jeroen helped get the team onboard and managed to deliver on time.



Dennis Vriend, Cloud-Native Software Engineer at Binx.io, helped rebuild and re-platform another component that was moving to China soon, namely the Mendix build server. The build server compiles customer applications and turns them into an executable ready for deployment. The new version of the build server was built from scratch, made scalable and cloud-agnostic, and moved to China successfully. The new build server will soon also be rolled out by teams in Rotterdam for usage by European customers.

A Future of Global Growth

When entering the Chinese market, the company's first proposition was 'Mendix for Private Cloud', which many customers are using today. On March the 31st of this year, Mendix went live with its public low-code cloud platform.

Smets says: "We launched four of our fourteen capabilities. We needed a baseline and will continue to add the App Store, project management, Data Hub, and more – by either relocating or rebuilding."

The Results

For Mendix, three things were essential in expanding to China: standardization to be able to scale, flexibility to be able to meet challenging customers' requirements and speed, to be able to keep up with the Chinese way of working. By partnering with Tencent and Xebia/Binx.io, using cloud technology and Kubernetes, and taking a phased approach to introducing the platform to the Chinese market, Mendix has managed to tick all these boxes.



For more information about
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