

March 5th 2021

Why Google's Apigee for HeidelbergCement?

An overview of Google's Apigee API Management Platform and its value for HeidelbergCement's digital transformation journey





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Preamble by Gabriele Eder, Segment Leader Manufacturing

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Dear HeidelbergCement executives,

I hope that you and your families are well and healthy during these challenging times.

Thank you for inviting us to be part of your API Management Request for Quotation (RFQ), which we feel honored to answer with the questionnaire attached to this document.

We believe in the upside potential - beyond this RFQ - through a collaboration between HeidelbergCement and Google Cloud. Therefore, we have prepared this document to outline how we can empower HeidelbergCement to reach and exceed the goals defined in your corporate strategies **Beyond 2020** and **HDigital**.

HeidelbergCement is a leader in the building materials industry for more than 150 years and has set up a solid foundation to be the **industry leader on the path to carbon neutrality**. At the same time, the digital transformation is an opportunity to impact top and bottom line results through simplifying business processes and enabling operational excellence. Thinking and acting long-term - as one of your cultural cornerstones - unites HeidelbergCement with Google.

Your extraordinary engineering and innovation capabilities will generate even more impact when combined with the best of Google's technologies and innovation culture. To accelerate our potential partnership, we are prepared to co-invest in new products and services which enable HeidelbergCement to unlock Building Information Modeling ecosystems for a sustainable future.

Our Google Cloud bid team is 100% committed to serve you today and in the future - and so am I.

All the best,



Gabriele Eder
Segment Leader Manufacturing



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1 Joint DNA: Sustainable Thinking and Acting



This RFQ, with its primary focus on API Management within HDigital for the strategic pillars HConnect, HProduce, and HCore could serve as an important cornerstone for the HDigital strategy in 2021. Together with Google, HeidelbergCement has the potential to not only build a solid foundation with an API first approach but also to drive value with API Management on a holistic approach with Enterprise Architecture, Manufacturing applications like IoT and Edge, and the upcoming S/4 HANA transformation. Before we show in great detail Google's unique API approach in the next pages - we want to emphasize that HeidelbergCement and Google have much more in common than it may seem at first glance.

"We build technology that helps people do more for the planet." is a core element in Google's Mission. Google has been carbon neutral for 14 years and became the worldwide first major company to be carbon neutral. "Thinking and acting long term" is key to Google, so is it to HeidelbergCement. A worldwide leader in the building material industry. HeidelbergCement has been enabling for one and a half centuries human progress. HeidelbergCement helps the world to be mobile, connect each other and provide human beings with a home.



With the new corporate strategy Beyond 2020 HeidelbergCement is ready for the next step to lay the foundation for the future. Rethinking the way of working, sustainable solutions for customers and the environment, and solving challenges before they arrive are key for HeidelbergCement. Google has shaped the new style of working, being carbon neutral and heading to carbon freedom until 2030, and organizing the world's information and making it universally accessible and useful are in our DNA. Observing that HeidelbergCement counts on combining forces across regions, Google strongly believes that a strategic partnership of HeidelbergCement and Google could be a key substance for the transformation with Beyond 2020. Accelerating the journey to become the one leader that turns the building material industry CO² neutral.

2

Google's Unique Approach: Best of Google with Apigee



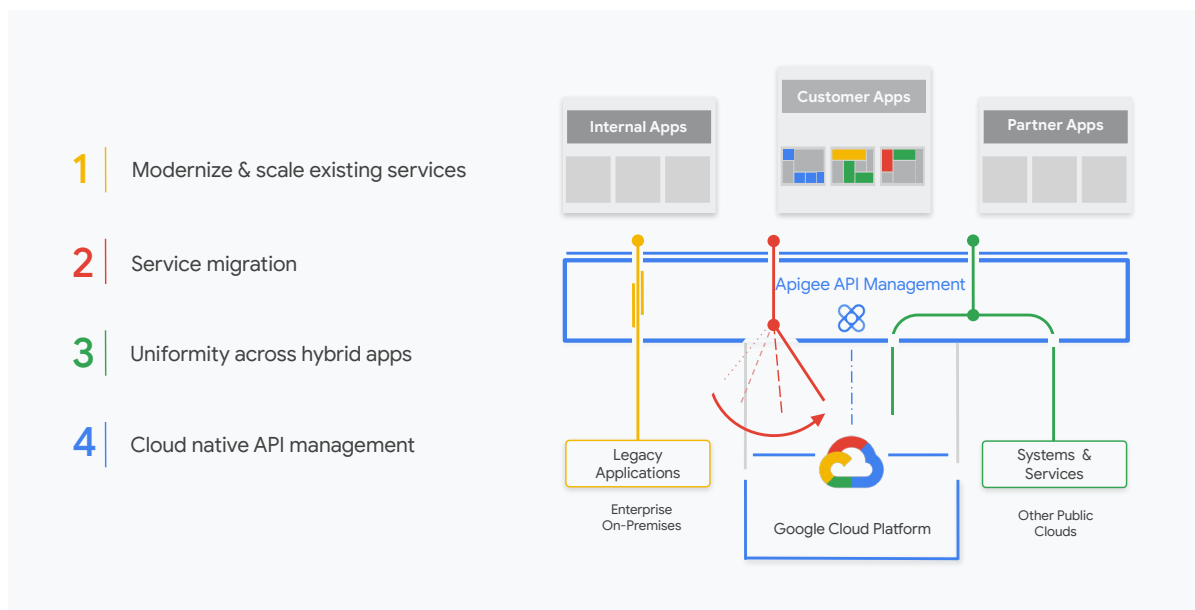
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Google Cloud: More than Apigee



Google Cloud accelerates organizations' ability to digitally transform their business with the best infrastructure, platform, industry solutions and expertise.

With Google Cloud as your Cloud Service Partner we can help HeidelbergCement on your digital transformation journey to become the first industrial tech company in your sector. Google Cloud and HeidelbergCement can directly work together on strategies and solutions to achieve a complete End-to-End integration.



With a wide range of solutions and products in Google Cloud we bring additional value within your projects as for example SAP S/4HANA transformation, customer service center optimization, better real-time insights into data and the achievement of business excellence.

Having observed HeidelbergCement's digital strategy HDigital, in the next paragraph we have put our forces and expertise together and started to collect some great ideas to sustain HeidelbergCement on its digital transformation within Beyond 2020. We believe that everything is possible with Google Cloud. Therefore, we are happy to offer a workshop with our Google experts combined with the industry experts of HeidelbergCement in order to lay a strong foundation for a strategic partnership.

Contact Center AI

Improve customer service with AI that understands, interacts, and talks

Use **Apigee** and leverage the data in your customer service centers to make sure those inquiries are fulfilled with real-time data and automation. Apigee is already a key part in the connectivity and data-source layer of Contact Center AI. Create value on your **HService** journey to step change in shared service center efficiency **Contact Center AI** delivers exceptional customer service and increases operational efficiency using AI-powered conversation. It helps to enable your virtual agent to converse naturally with customers and expertly assist human agents on complex cases, thus improving customer satisfaction while reducing handling times and agent training costs.

AppSheet – No-Code Platform

Enable everyone in your organization to build and extend applications without coding

Accelerate your customer experience in upcoming **HConnect** projects with AppSheet. **Apigee** and **AppSheet** are natively connected and APIs can be used as a datasource to speed up digitization efforts. Empower all of your employees to build mobile and desktop applications without coding, in a secure, IT-governed environment. Leverage cutting-edge AI-powered, intent-based app development to enable everyone, everywhere to build apps. Recent advancements in no-code app development, however, make it possible for the average business to leverage robust business productivity apps designed to support their unique workflows. As a result, more and more apps are flooding into manufacturing facilities changing the way workers engage with their jobs, team members, and environments.

HService



Our ambition:
Cost leadership in
back-office administration

HConnect



Our ambition:
Most widely used customer
experience based on real-time
insights and highest possible
degree of automation

Edge TPU

An open, end-to-end infrastructure for deploying AI solutions

Edge TPU can be used for a growing number of industrial use-cases such as predictive maintenance, anomaly detection, machine vision, robotics, voice recognition, and many more. It can be used in manufacturing, onpremise and IoT scenarios. Bring **Machine Learning** to your construction sites at the Edge.

Google Cloud Architecture Framework

Best practices architectures and implementation guidance on products and service

With Google Cloud as a partner you get access and guidance on how to make best practice design choices in the cloud to improve your operational efficiency. These include approaches for automating the build process, implementing monitoring and disaster recovery planning. On your way to optimize your operational excellence to reach your **HProduce** goals.

BigQuery

Bringing multi-cloud analytics to your data

Break down silos and gain insights on data. Accelerate your journey in **HInsight**. Power your business across clouds with a flexible, multi-cloud analytics solution. There's no need to move or copy data from other public clouds into Google Cloud for analysis. Tap into the power of BigQuery to cost-efficiently break down data silos and make analytics work for you.

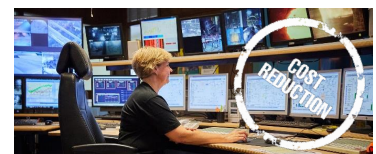


HConnect



Our ambition:
Most widely used customer experience based on real-time insights and highest possible degree of automation

HProduce



Our ambition:
Transfer our best-in-class production management to the digital age

HInsight



Combining state of the art tools and expertise to speed up our "time to insight" with real time and consistent data



SAP on GCP

Optimize your SAP business applications with Google Cloud

With Apigee you can wrap standard SAP interfaces into modern APIs, provide reliable interfaces to SAP systems and monetize access to your data.

Google Cloud is not just another place for HeidelbergCement to run SAP on, we believe it's a place to innovate SAP based on comprehensive cloud native tooling and platform capabilities and help you on your way in the **HCore S/4HANA transformation** project. Google is not only an industry leader in key areas such as AI / ML, API Management, as well as Data Management at scale, but it's also a strong partner to its customers in working together to develop new and innovative ways to apply its technologies to existing enterprise solutions such as SAP. This is exemplified through the strength of the partnership that Google has invested with SAP, including private datacenter support and embedding Google technologies into SAP solutions with Machine Learning at the Edge for IoT scenarios and API management, as well as continuing to provide a scalable set of cloud capabilities to extend SAP's existing portfolio of solutions. With Apigee API Management you are best equipped to manage SAP APIs from on-premises as well as cloud.

Google Workspace

Transforming how enterprises work

Google Workspace (formerly known as G Suite) can help you to provide a consistent employee experience with cloud-based apps like Gmail, Docs, Drive, Calendar, and Meet to get things done. Work faster, smarter, and more collaboratively than ever before with Google Workspace. Workspace gives you the insights to gain the strategic advantage in your field.



HCore



Continue our journey to deploy and develop our core system backbone, whilst powering up our next generation ERP

HPeople



To provide a consistent employee experience from recruitment to retirement with continued investment in digital collaboration tools



4 Apigee: Leading Digital Innovation Platform



We have outlined our formal responses to your requirements in the RfQ questionnaire as requested. In addition, we want to provide you with deeper insights and thoughts on your use-cases and the overall value proposition of Apigee.

Apigee is a leader in the API Management space and differentiates through a couple of things:

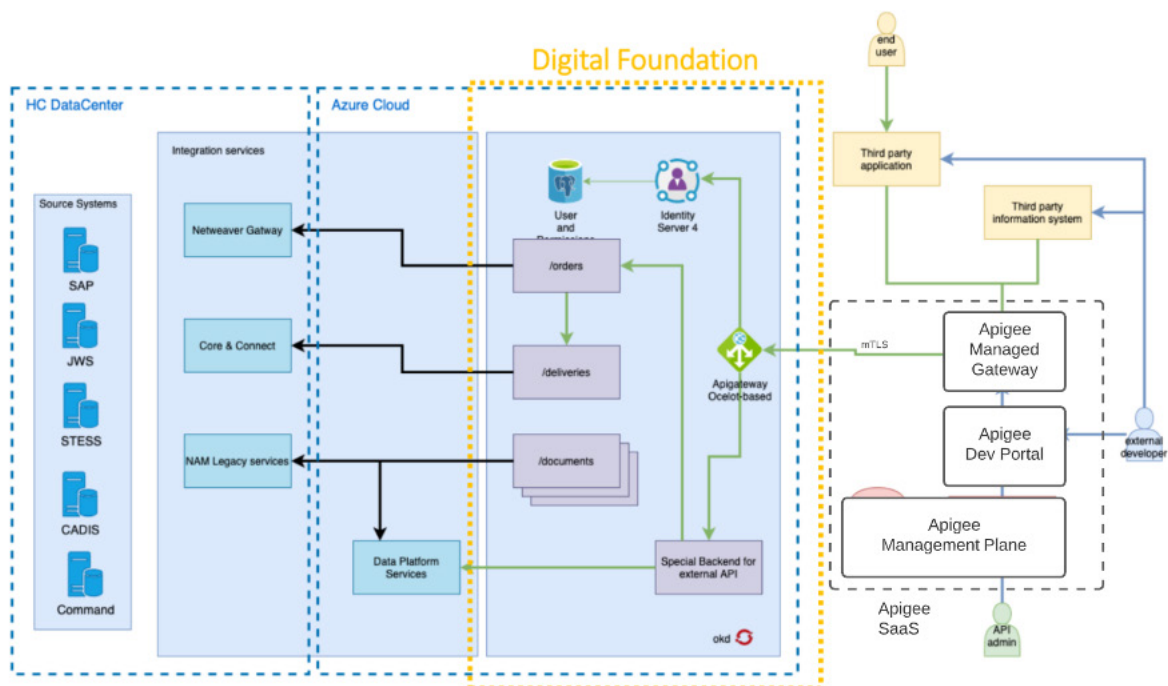
- Scalability & Reliability
 - With its 10th birthday Apigee has delivered for a decade as a market leader
 - During peak-hours on Blackfriday / Cybermonday Apigee auto-scales up to more than 250.000 API calls / second with 100% uptime in 2020 - so HeidelbergCement can confidently put business-critical workloads on the platform and rely on Apigee as your digital nervous system
- Overall TCO & Long Term Success
 - Low and predictable cost of operation, even at global rollout and scale for multiple environments and regions
 - Fast initial setup and onboarding reflected also in the implementation estimation in the questionnaire
 - Google Cloud assists HeidelbergCement with a Long Term Success plan jointly with our partner of your choice
- Speed & time-to-market
 - Achieve business excellence faster through the way Apigee manages APIs as products
 - Initial platform setup can be done in a few days and first MVPs in less than two weeks
 - API-first driven development with a full SDLC integration
- Flexibility
 - Apigee is build API-first, so anything you do can be automated and integrated in existing tooling at HeidelbergCement
 - Freedom to deploy an enterprise gateways wherever needed - SaaS, Multi-cloud and Hybrid
 - With Apigee adapter for Envoy we can deeply integrate also in "east-west-traffic" / microservices types of workloads

For either use case, we can support your existing Ocelot-based gateway however offer the option to use hybrid gateways as well for future development (see e.g. use cases 2 and 3 below). In addition, the Apigee adapter for Envoy could be interesting to look at for HeidelbergCement.

For all three use cases outlined, we propose one joint enterprise architecture which combines “managed gateways” as well as “hybrid gateways” which you can run anywhere on your own. We’ve updated HeidelbergCement’s use case diagrams with our proposed architecture in the following. In addition, we want to highlight that HeidelbergCement can manage both, hybrid and managed gateways in the exact same way. This allows to streamline the API Lifecycle Management incl. all phases like Design, Development, Security, Deployment, Monitoring, Analytics and Monetization.

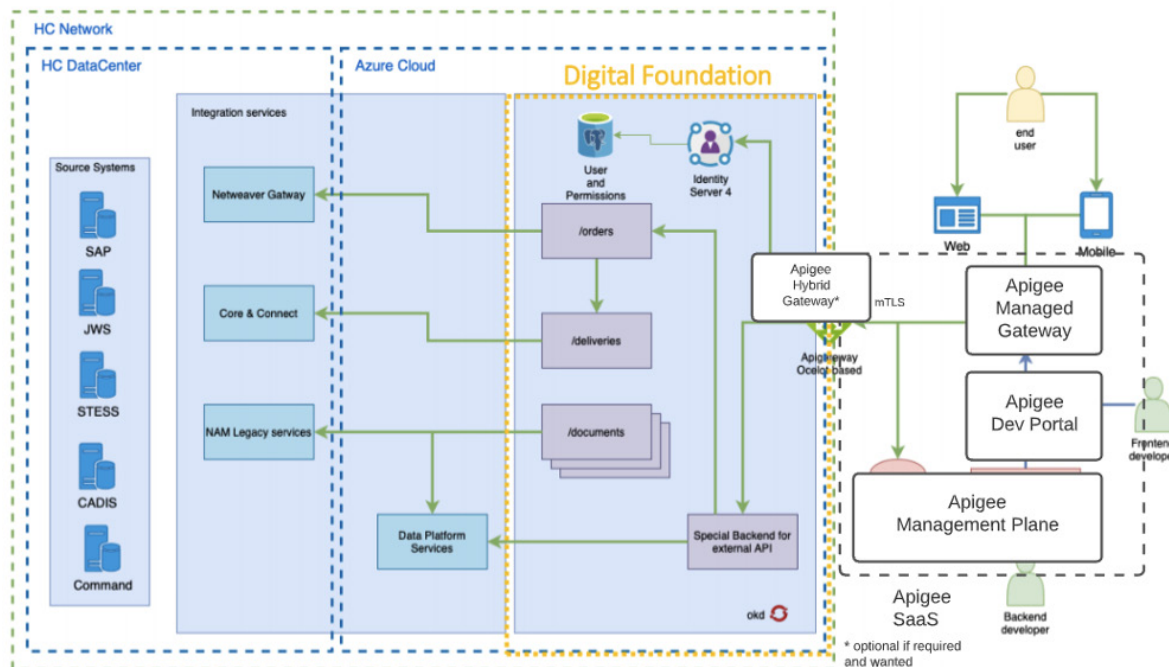
Use Case 1: HConnect, API as a Product, Data as a Service

- Apigee SaaS including autoscaling for the cloud-based gateway
- Full API lifecycle capabilities in the cloud incl. Azure AD (SAML) integration, covering all requirements mentioned in “API-Management_RfP_Use_Cases.pdf”, page 6
- Dev Portal user management via SAML integration with Identity Server 4; customization of the integrated, managed portal is possible
- Sending logs and metrics is possible on various levels - depending on specific requirements



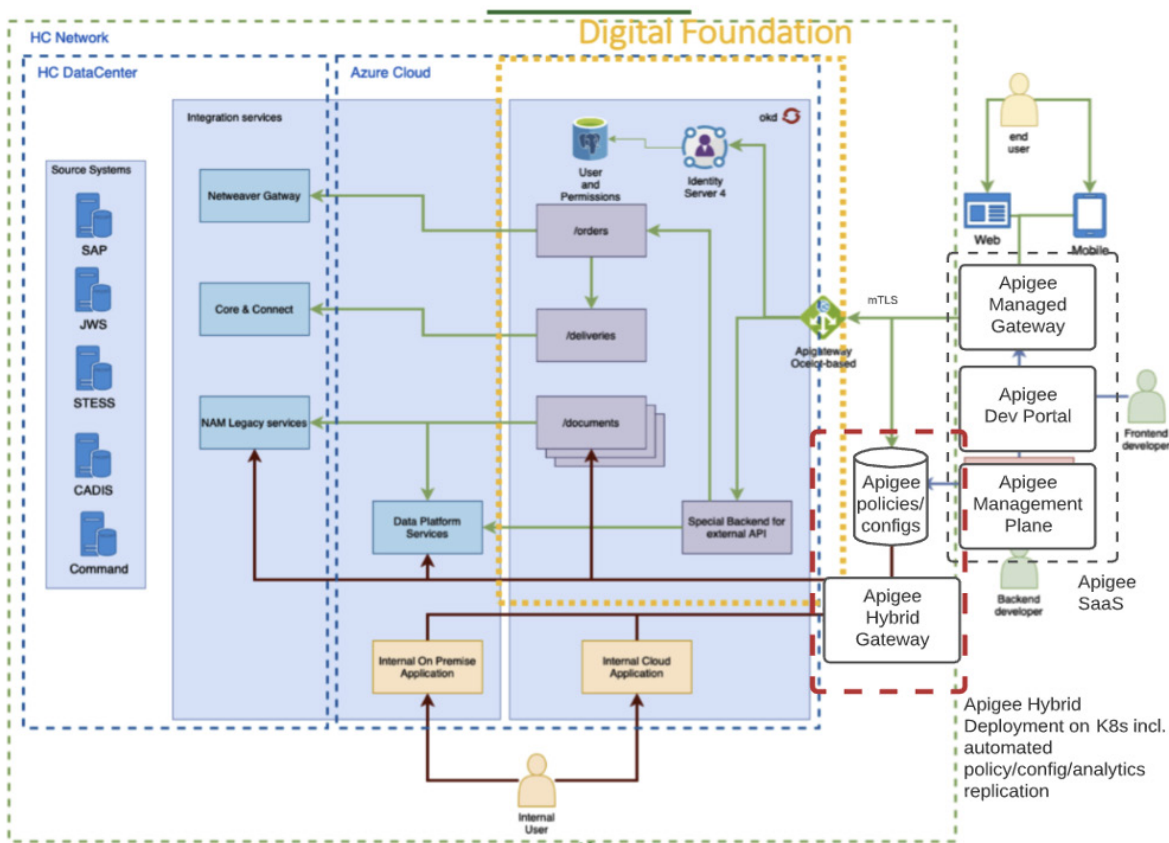
Use Case 2: HConnect, Digital Products, Mobile and Multi-Experience

- Apigee SaaS including autoscaling for the cloud-based gateway
 - Possibility to send to different (OpenShift) backends, e.g. based on location / IP / user / API key; leveraging the Google Cloud global network
 - Optionally, use of Apigee Hybrid Gateway 'behind' the Azure traffic manager
- Full API lifecycle capabilities in the cloud incl. Azure AD (SAML) integration, covering all requirements mentioned in "API-Management_RfP_Use_Cases.pdf", page 9
 - GraphQL and gRPC are supported on gateway level
- Dev Portal user management via SAML integration with Identity Server 4; customization of the integrated and managed portal is possible
- Sending logs and metrics is possible on various levels - depending on specific requirements



Use Case 3: HConnect and HProduce, Internal API Catalog, Data as a Service, Integrating using APIs

- Apigee SaaS leveraging the hybrid gateway option
 - Deployment in Azure (EKS) and on-prem HC data centers is possible
 - Optionally, use of Apigee Hybrid Gateway 'behind' the Azure traffic manager
- Full API lifecycle capabilities in the cloud incl. Azure AD (SAML) integration, covering all requirements mentioned in "API-Management_RfP_Use_Cases.pdf", page 12
 - Support of multiple identity providers is possible and "identity federation" is a very common use case for Apigee
- A separate managed Dev Portal can be deployed for internal APIs and role based access fully supported
- Sending logs and metrics is possible on various levels - depending on specific requirements



5 Selected references in the construction industry



1

Introduction

Built is one of the largest private construction groups based in Australia, privately owned since 1998. Built has employed over 1000 people working across Australia, New Zealand and the United Kingdom.

Statement of the customer

"In the past we have gone from spending two weeks to working with an app developer to get their requirements for an API, taking it away and then building it up eventually delivering the requirement. The most powerful features that I have seen with Apigee platform is really the speed and reusability. This whole process has now changed to two days and the mock can be delivered within an hour of when the request comes in."

- Aidan Giles, Head of Engineering, Digital, Built

With Google Cloud

- Maximise speed and scalability of information exchange
- Expose APIs to multiple third parties internally

Why Google Cloud?

As a construction company, Built has sites across Australia and New Zealand, each site has hundreds of subcontractors and information exchange in real time was the goal for Built. Google Cloud's Apigee platform has helped deliver information exchanges in real time.

2

Introduction

An American Fortune 100 corporation. This company is the world's leading manufacturer of construction and mining equipment. Headquartered in the U.S. - 150 locations all over the world.

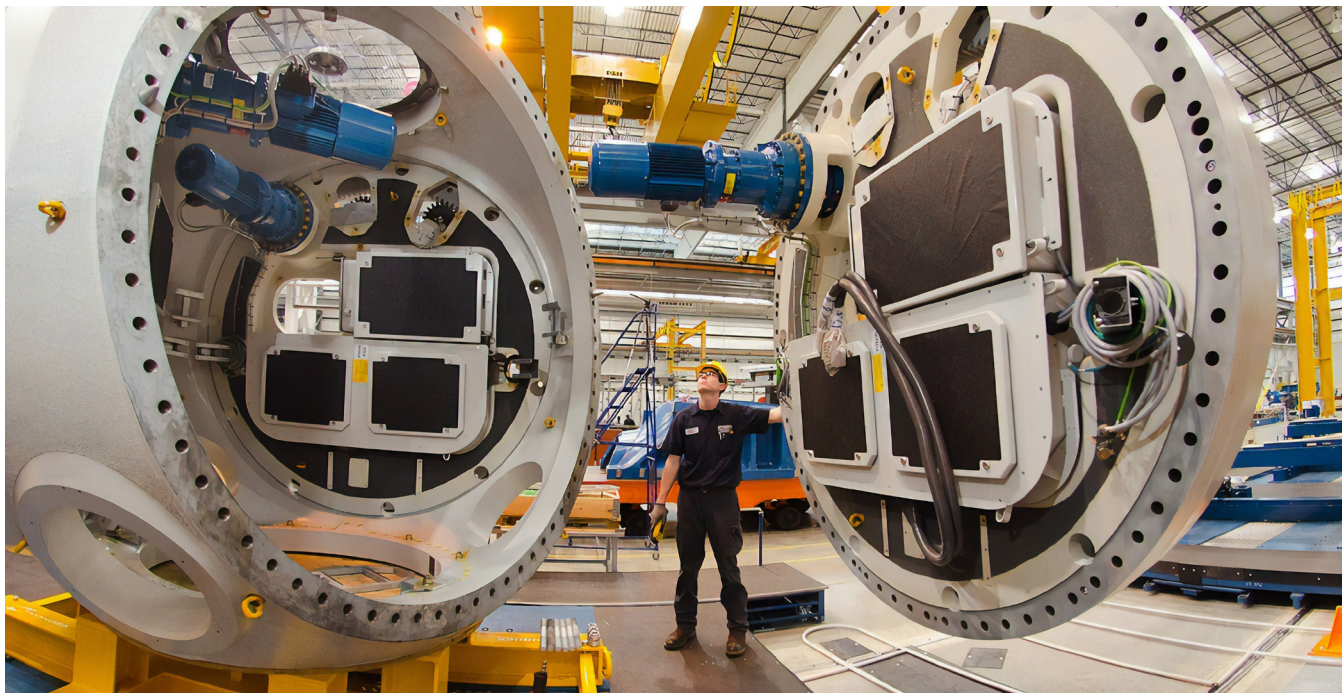
With Google Cloud

- The company's Enterprise Data Hub for IoT connected tractor and Telematics capabilities leverage machine learning to track the health of their products across the globe
- Publishing APIs to allow customers secure easy access to telemetry, health and maintenance data along with fleet insights
- The company has built a developer portal as a single source to access fleet's machine data with over 2000 APIs published on the portal

Why Google Cloud?

- Product Value Add - AI Powered Fleet Management solutions to optimally manage fleet maintenance, purchases, deployment and telematics
- Vehicle Management allows individual management of telematics for given vehicles. Insights in atomic level details
- Sales Insights - Proactive Maintenance Services, Cross/Upsell and New Orders
- Supply chain digitization, Secure Access to IOT Telemetry & Analytics, eCommerce / Order Management

6 Selected references in the manufacturing industry



3

Introduction

Festo is a leading world-wide supplier of automation technology and leader in industrial training and education programs. The company is present worldwide with 61 countries, 250 branches and 21,000 employees globally.

Statement of the customer

"Before the launch or start of the API journey, we discussed with a lot of stakeholders for more than a year to really challenge the competitors of Apigee in the market, we also discussed the migration between our integration layer in the API management, spending a lot of time. In the end we decided that Apigee fits us the best for our use case"

- *Dennis Hunt, Enterprise Architect, Festo*

With Google Cloud

- Support innovations and develop new business channels
- Migrate existing solutions and focus on consolidation of internal APIs
- Open up SAP data for IT Agility and more use cases based on the core business data via APIs

Why Google Cloud?

Festo wanted to improve security, serve new business requirements and open up new business channels. After 1.5 years of thorough research from Festo, they decided that Apigee fits all their use cases - use Apigee as the central API platform for internal and external APIs and creating shareable and reusable APIs - and reduces costs for new frontends using the available APIs.

4

Introduction

BMW is a German multinational company headquartered in Munich and is the world's leading manufacturer of premium automobiles and motorcycles, also providing premium financial and mobility services.

Statement of the customer

"In my whole history of working in IT, I've never had a better support than from Apigee along our journey!"

- *Lothar Werzinger, APIM Program Lead at BMW*

With Google Cloud

- Rapid deployment of platform offering access to BMW data systems to other partners
- Without compromising internal security guidelines, API management solution, allowing data access to hundreds of partners
- BMW complies with the EU regulation to offer the data to 3rd party repair shops for their cars and saves millions of dollars in fines

Why Google Cloud?

Google worked closely with BMW to conduct a design workshop to start with a prototype eventually building the API. The process involved establishing end to end flow of service publication in Apigee, integration of OpenAPI, creating an API product and API Proxy for this use case, finally creating a developer portal specific to the use case environment. The design workshop helped BMW gain buy-in internally to build the use case on Apigee.



Google Cloud