MHP
A PORSCHE COMPANY

DevOps

DevOps for Serverless Application

Automotive Customer

DevOps for Serverless Application

CUSTOMER — International automotive OEM

The customer is an international automotive OEM, operating a solution to aggregate and present specific data around an individual vehicle for various consuming systems in e.g., repair and assembling shops. The solution furthermore helps in compiling and assembling complex service event calculations by meaningfully enriching them with information from a number of aftersales source systems. The solution formerly started out as a calculation service providing maintenance service items and the related cost positions for one of the customer's car brands and has since developed into a central service for virtually all car brands owned by the customer with extended use cases to integrate service events, different service products and technical details pertaining to a specific vehicle like e.g., related oil norms.

CHALLENGE — It's all about scalability

Due to a steady increase in users and resulting increased unpredictability of the solution's workloads, scalability and startup times were already causing a bad user experience in some cases. Based on prior load and performance tests, specific bottlenecks within the product were also identified. Furthermore, the on-premise systems on which the solution was hosted had already been deprecated.

The customer had to make a decision, therefore, MHP was approached for support with the explicit ask to find a solution for the scalability problem, that also addressed the solution's increasingly global footprint. Based on MHP's previous experiences with the cloud as an adequate platform for such requirements and the customer's IT strategy asking for future workloads to be preferentially deployed to cloud, a feasibility analysis for a cloud migration from a business and technical perspective was to be done. As the customer's data was sensitive in nature and its security a top priority, AWS was chosen as the most-secure cloud platform.

SOLUTION — Fast and secured development with modern methods

An MHP team consisting of business and cloud technology specialists went with the structured 3-stage approach "Assess", "Mobilize" and "Migrate & Modernize" to analyze the customer's current solution and DevOps readiness. During the **Assess**-phase MHP created the high-level business case for staying on-premise as opposed to different AWS cloud migration options according to the 7Rs. MHP also made a first assessment of the customer's overall readiness for a cloud migration in general by means of a Migration Readiness Assessment (MRA). Furthermore, MHP did several Well-Architected workshop sessions with the customer's technological staff, to understand the solution's current buildup and state. The examinations rendered, that the current solution was created following a micro-service architecture approach and was being operated on a self-hosted open-source platform, which entailed a lot of undifferentiated heavy lifting. Additional cost data was provided by the customer and a first calculation for a possible AWS architecture with and without modernization was done. Since the business case for the AWS cloud migration & modernization as well as accompanying architecture workshops showed significant cost saving benefits plus an increase in performance, operational efficiency, reliability and security, the customer agreed to migrate and modernize the predictive analytics application to run natively on AWS in scope of a re-factoring approach.

As part of the migration and modernization of the predictive analytics application on AWS, the customer has agreed to adopt a DevOps-based approach. This is to benefit from cost-saving benefits, operational efficiency, reliability, and security. Infrastructure automation tools such as templates, AWS Cloud Development Kit (CDK) with Typescript, Git, AWS CodePipeline, and AWS CodeBuild were utilized. This allows for a streamlined process, greater adaptability, scalability, and transparency. By adopting this approach, the customer can achieve faster time to market for their applications and services, ultimately improving their business outcomes.

During the **Mobilize** phase, the MHP team, in alignment with the customer, laid out a detailed plan to move the application to native AWS Services to minimize future operational overhead. Especially the combination of cloud-native, purpose-built and serverless AWS services allowed for significantly better scalability of 30%-40% faster scaled functions, which was one of the customer's main concerns. A load and penetration test performed on the pilot by MHP-independent resources revealed very good results of 40%-50% faster responses, that convinced the customer to give the MHP team the go-signal to fully **Migrate and Modernize** the application in several waves including the agreed DevOps practices and services. The full-scale migration waves were performed according to the concepts of the MHP Serverless Transformation Factory consisting of people, tools, runbooks and processes for a respective

workload as well as AWS Prescriptive Guidance where applicable. Additional external load- and performance tests, penetration tests and open-source audits were executed as well as additional Well-Architected Reviews to identify possible high risks for the Go Live and future enhancements.

The architecture construct was realized using the following AWS services:

- **Amazon API-Gateway** for API management
- **AWS Lambda** for the application logic
- **AWS Step Functions** for orchestrating the solution's workflows
- **AWS Certificate Manager** to manage domain certificates
- **Amazon Route53** to manage the DNS
- **Amazon DynamoDB** for data persistence
- **Amazon S3** for storing historical data and import destination of raw data
- **AWS Glue** for data preparation of provided raw data for calculations
- **GitHub + GitHub Actions** as VCS and CI/CD pipeline for automatic deployments
- **AWS CodePipeline and AWS CodeBuild** for automating the continuous integration, delivery, and deployment of infrastructure changes
- **AWS Cloud Development Kit (CDK) with Typescript** for creating infrastructure templates
- **AWS X-Ray** integrated into StepFunctions to allow detailed monitoring
- **AWS CloudWatch** for logging, monitoring metrics and alarms

OUTCOMES – Server less and DevOps based, benefits more

After the migration was finalized, initial cost projections showed that the new cloud-native, purpose-built, and serverless architecture on AWS was able to reduce operating costs by around 70%-80%. Further tests conducted by independent third parties revealed that the new architecture provides consistent high performance and scalability, a strong security posture, better maintainability, and increased availability. By adopting a DevOps-based approach and infrastructure automation tools such as templates, AWS Cloud Development Kit (CDK) with

Typescript, Git, AWS CodePipeline, and AWS CodeBuild, the customer was able to achieve a more efficient and streamlined process for managing their infrastructure while also reducing costs. The benefits of serverless computing and infrastructure automation allowed the customer to achieve more while managing less, ultimately improving their business outcomes.

ABOUT THE PARTNER - "ENABLING YOU TO SHAPE A BETTER TOMORROW"

Functioning as a technology and business partner, MHP digitalizes its customers' processes and products, and guides them through IT transformations along their entire value-creation chain. MHP is a digitalization pioneer for the mobility and manufacturing sectors with expertise that can be transferred to a wide range of industries. MHP is a distinguished AWS partner, currently holding the Advanced tier status and offering Consulting as well as Software services to its customers. Additionally, MHP is a member of the APN Immersion Day program as well as AWS Well-Architected Partner and to date obtained 10 AWS Service Delivery Program Validations (SDPs), two of which MHP achieved as a launch partner.

MHP serves over 300 customers worldwide, including large corporations and innovative SMEs. MHP advises on both operational and strategic issues, offering proven IT and technology expertise as well as specific industry know-how. MHP operates internationally as OneTeam with headquarters in Germany and subsidiaries in the USA (since 2011), UK (since 2016), Romania (since 2014), and China (since 2013).

The MHP Group has been shaping the future alongside its customers for over 25 years. The MHP team of over 3,300 employees is united by the company's promise of excellence and sustainable success. This promise continues to drive MHP – today, tomorrow, and in the future.

"MHP: DRIVEN BY EXCELLENCE."