# Serverless Transformation Factory

AWS Transformation Serverless Application

Automotive Customer

# AWS Serverless Transformation

## 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. 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.
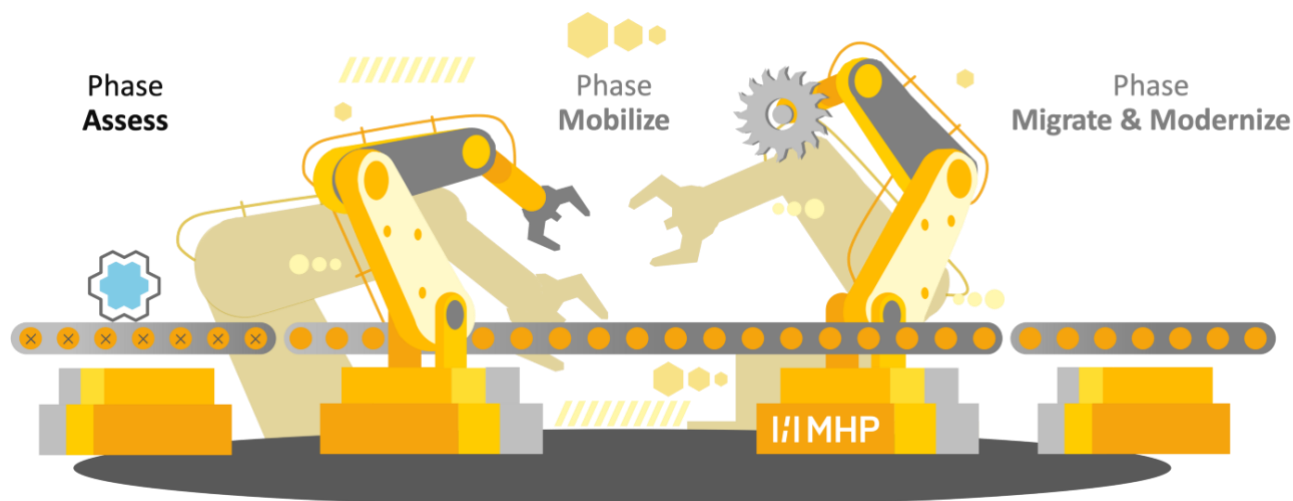


(Source: https://youtu.be/yXR9NJ_J68E)

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.

A managed AWS Landing Zone concept was chosen, and specific parts of the workload were migrated in scope of a pilot migration. For the pilot the least scalable service based on metrics from pre-executed load and performance tests was chosen to demonstrate the benefits of the refactoring strategy. The solution was modernized step by step using decomposition patterns like the strangler pattern and moved to AWS Lambda and AWS Step Functions. Databases used by the application were migrated with AWS's cloud-native purpose-built database solutions to harness the full benefits of the cloud in the data layer as well. Data pipelines were setup using Glue to prepare Amazon S3 located raw data into datasets stored within AWS DynamoDB for optimized function calls. API access was realized by means of Amazon API Gateway to have a reliable, scalable and secure entry point to the pilot for the customer's end-users.

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. 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. The final 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
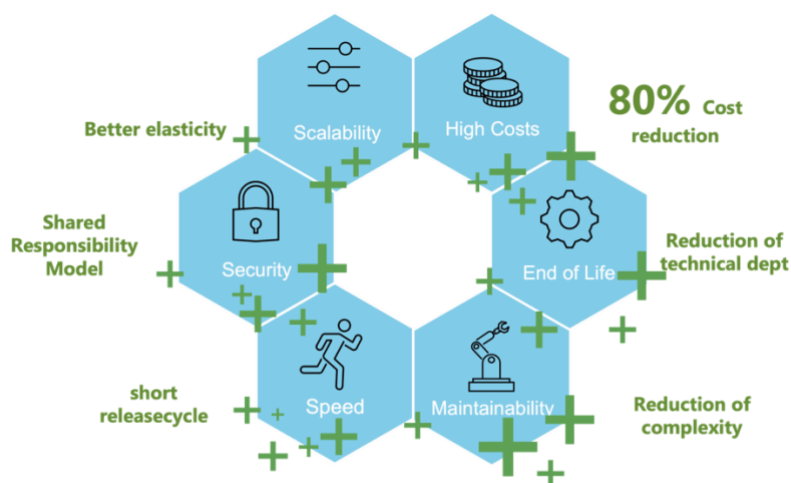
Benefits of the AWS Migration

## OUTCOMES – Server less, benefits more

After the migration was finalized, initial cost projections were able to show, that the new cloud-native, purpose-built and serverless paradigm incorporating architecture was able to reduce the operating cost by around 70%-80%. Further tests by independent 3rd parties revealed, that unlike the former, legacy platform deployment, the new AWS architecture provides consistent high performance together with scalability, a strong security posture, better maintainability, and increased availability.

## 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."