embold

The intelligent software analytics platform for the automotive industry.

Take real-time decisions, increase performance and deliver high quality products.

FOR MANAGERS

Deliver high quality code in time-critical environments.

FOR DEVELOPERS

Solid foundation so that there are no breaks.

FOR THE CODE

01

Understanding and controlling software quality is no longer a nice to have – it is impacting share price, bottom-line and most importantly reputation and liability risks to companies

THE CHALLENGES

° **Software programs are slowing down automotive industries.**
Volkswagen's Tesla Fighter, **has massive software problems**, experts at VW claim they believe the software was developed too hastily. Test drivers face 300+ errors per day that require 10,000+ software engineers to work 24/7 to mitigate these. After already having manufactured a large number of vehicles with the current system and the huge taskforce, **the launch will be delayed by a year**, is proving to be a very expensive affair.

° **Even companies with the best talent in the world, are struggling.**
Tesla's infotainment systems and touch screens are proving to be defective, within only a couple of years of use and / or high temperatures. This causes important functions such as audio alerts, defogging system and backup camera to fail. **The core of the problem has been identified to the code within their MCU that is under investigation by the US Federal Govt. Due to the high number of complaints and claims.** Tesla has not commented.

° **One of the big three automotive companies needed a recall.**
Chrysler declared a recall of over 162,000 Chrysler Pacifica minivans released in 2017 **due to an unforeseen software glitch.** The glitch reportedly caused the vehicles to stall, which had resulted in an accident that connected back to the identified defect.

OUR APPROACH

° Identify problems throughout the software development lifecycle which would otherwise cost companies and teams – money, time, degradation of quality, liabilities and reputation damage.

° Detect architectural and design issues and highest coverage of code metrics

° Create actionable intelligence derived from code, leveraging AI and Machine Learning
.
° Leave no stone unturned, work across all software platforms and adapt to use cases.

APPLIED TOOL

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OUR CLIENTS

Continental, BMW, Volkswagen, MAGNA, Task force, DENSO

THE RESULTS

° **Reduced time-to-market**

° **Adaptable systems that work**

° **Quality control – developers write high quality software every single time**

° **Maximized quality control and reports due to continuous integration through CICD model.**

° **Increased performance and accuracy**

° **Ability to take real-time decisions**

° **Code complexity issues no longer a cause of worry**

° **Legacy systems replaced with high-quality manageable software.**

02

Who we are (www.embold.io)

Out on a mission to become the de facto A PLATFORM DEVELOPED BASED ON THE LEARNINGS FROM THE CHALLENGES WITHIN THE AUTOMOTIVE INDUSTRY.

Our company

Founded in 2009 in Germany, spirited with the Silicon Valley DNA of its founders, Embold is a venture backed technology company headquartered out of Frankfurt, Germany.

Quick Facts

° Seasoned in supporting large enterprises in designing and improving their data-driven software development quality and analytics programs.

° Product-centered, with strong R&D focus, our engineers design our products from the ground up and react to the demands of the market continuously.

° Funded by leading German VCs and Business Angels, we do not intend to stop growing.

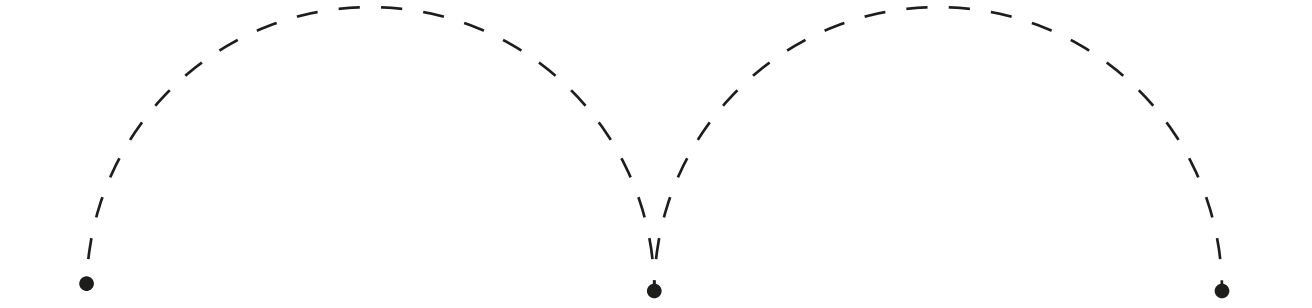
Our platform

° **Multi-dimensional, intelligent software analytics platform.**
Only solution on the market detecting architectural and design issues and highest coverage of code metrics and issues.

° **AI Driven Code Analytics Platform.**
To create actionable intelligence derived from code.

° **Built and designed to adopt to our customers use cases.**
Our software is built for customization to incorporate use cases around developer analytics and design-centric code quality analysis.

03
Global locations



Pune, India

Home of our CTO A.I.., R&D and development center.

Frankfurt, Germany

Headquarter, Home of our CEO Strategy, Sales, and Customer Success.

Tokyo, Japan

APAC HQ
Sales, partners and Customer Success

04

The biggest names in the industry are failing

CHALLENGES IN THE AUTOMOTIVE INDUSTRY

Software programs are slowing down automotive industries.

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One of the big three auto manufacturers needed a recall.

In January 2018, Fiat Chrysler Automobiles NV declared a recall of over 162,000 Chrysler Pacifica minivans released in 2017 **due to an unforeseen software glitch.** The glitch reportedly caused the vehicles to stall, which had resulted in an accident that connected back to the identified defect. The reported issue caused the vehicle's engine control module to incorrectly assess the engine's operating status and resulted in a sudden stop. The Italian-American automaker estimated from the reports that this occurred at low speeds or when the vehicle started.

Continuous Testing and Deployment is important for every sector to ensure that the software is checked and updated in real-time. Automobile sector being highly life-sensitive needs to build strategic QA and Testing capabilities.

Understanding and controlling software quality is no longer a nice to have – is impacting share price, bottom-line and most importantly reputation and liability risks to companies.

05
Global automotive industry is embracing our technology

Some of our clients


06
Our experience

We are helping leading Tier-1 suppliers and manufacturing companies in a large variety of use cases and projects. This includes in-car software, like car multimedia systems, camera or networking firmware, and corporate software, like logistics, Product Lifecycle Management and more.

Embold is the core development platform for the future car telematics system, camera systems and autonomous driving.

Embold is used to build a central supplier QA platform, ensuring shipped source code follows the same high standards as internal projects.

Let Embold help you like we have helped these global giants.

07

Our approach

TO MITIGATE THE CHALLENGES FACED BY THE AUTOMOTIVE INDUSTRY.

Identify problems throughout the software development lifecycle which would otherwise cost companies and teams.

1. money
2. time
3. degradation of quality
4. liabilities
5. reputation damage

Detect architectural and design issues and highest coverage of code metrics to allow for well designed code that is built to last. A strong base will reduce the time needed to introduce new features as the project becomes more complex, it will also increase performing and efficiency of the task force.

Create actionable intelligence derived from code, allowing real-time decision making.

Our goal is to empower you to deliver great quality and manageable products, right on time.

A Smart Software analytics platform that helps companies achieve higher software quality.

EMBOLD FITS RIGHT INTO YOUR CURRENT SYSTEMS WITHOUT MUCH HEAVY LIFTING, HOW?

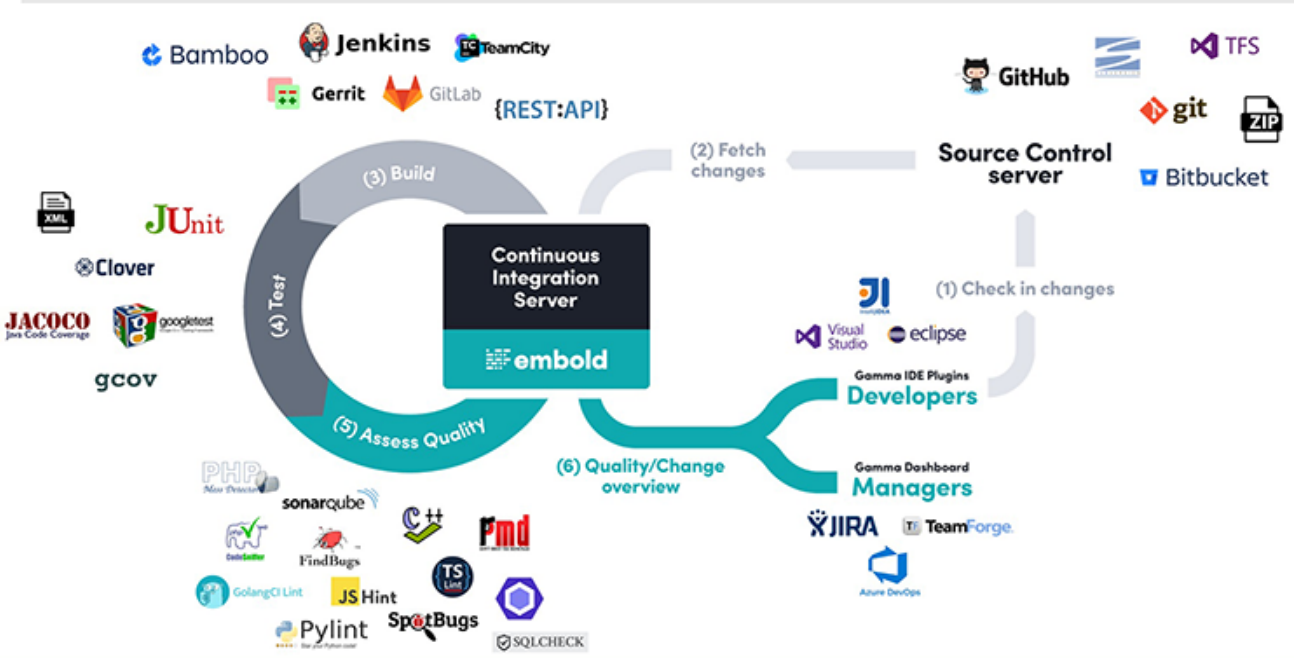
1 The platform identifies problems throughout the software development lifecycle and works within the CICD model to provide continuous integration to maximize quality control and provide better reports. Allows real-time decision making, increases performance and efficiency and mitigates degradation of quality.

2 It can be used across all major software platforms, applications, and phases of software development or maintenance.

3 It is offered both as a cloud version (SaaS) and on-premise. So you can pick what works for you and get going right away.

With Embold you can shift your focus on what you want to deliver, while it shows you how with the added bonus of great quality.

08
Enterprise Ready Integrations



09
The Platform

FIND BUGS AND FIX THEM IN REAL-TIME

SMART HEATMAPS
Visually comprehend the size and quality of every component and fully understand the state of your software at a glance.

DEPENDENCY DIAGRAM
View and navigate through all dependencies of your software components and learn how they influence each other.

COMPONENT EXPLORER
Understand issues on a component level with rich annotations and see where they are located in your code.

REFACTORING SUPPORT
Quickly understand how to refactor and split complex components by using our innovative partitioning algorithms.

Embold score

10
Gamified Multi-Sided Platform that connects the right minds

A cleanly designed, multi-sided platform around code that is simple to use, unifying and built from the ground up to meet highest demands.

C-Level

1. Responsible for delivery, quality and risk
2. Disconnected from the process
3. Wants to be in touch and control again

Software Managers

1. Pressure and Constraints to release Quality Software
2. Coping with complex, heterogeneous systems
3. Struggles in coordinating and driving teams

Developers

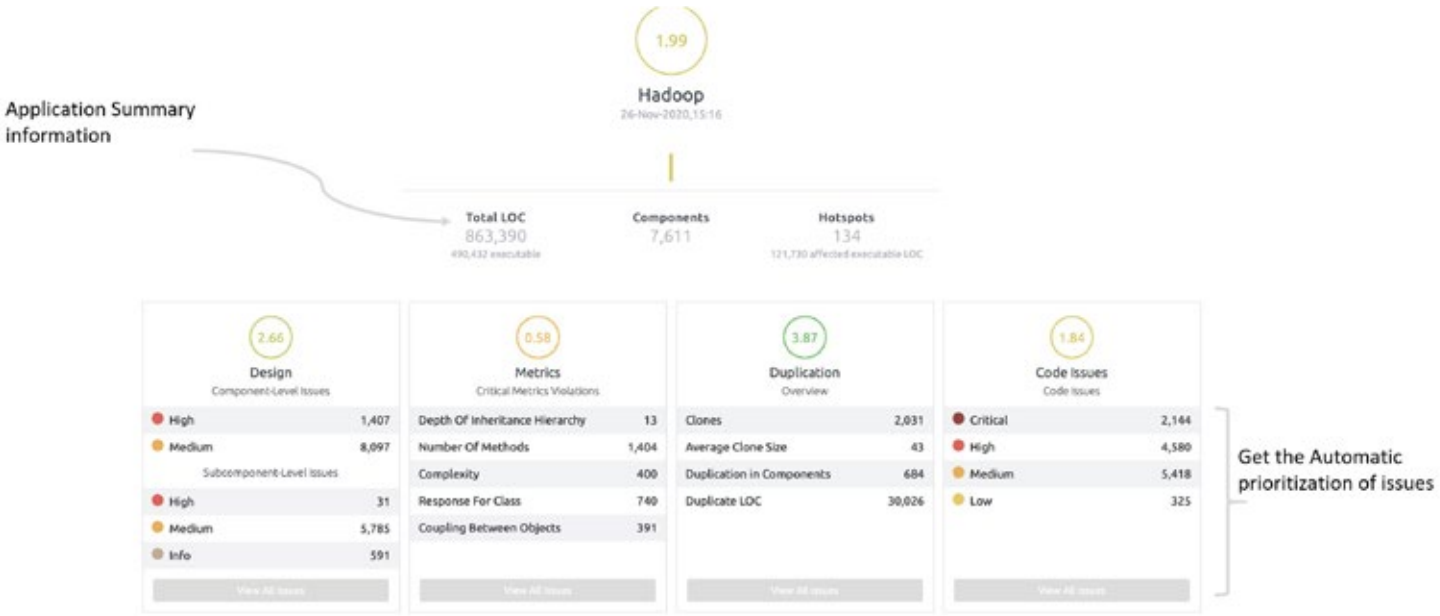
1. Brings in domain knowledge and skills
2. Often only responsible of small pieces of the code
3. Faces bug fixing and low-value cognitive activity

Code

1. Architectures break, bugs increase, maintenance
2. Becomes less secure, reliable and trusted
3. Becomes unmanagable and causes failures and damage

11
Overview & Root Cause Analysis / understood by all stakeholders.

12
Product / Complex issues simplified and explained



13
Core Use Cases

For MANAGEMENT

MANAGEMENT COCKPIT

Quickly read and react to changes made in your code base through actionable and non-technical dashboards and cockpits.

ESTIMATION AND PORTFOLIO

Estimate and bid data-driven on tasks/projects. Skip the rotten fruits and cherry pick high ROI projects. Clean out your portfolio and get access to higher overall margins.

COST & RISK REDUCTION

Embold early warning feature supports early risks recognition in the development cycle, minimizing development costs as well as risks influencing the estimated value of a project

For DEVELOPERS

PRODUCTIVITY IMPACT

Developers use Embold to drive effectiveness of their code review, improve system design and fixing bugs faster.

COORDINATION IMPACT

Embold brings a new language toolbox to your team that fosters communication and coordination beyond team level

ONBOARDING / LIFE CYCLE

Use Quality Gates, Team Composition and Embold features to get your new developers up to speed faster.

For THE CODE

CODE BASE MAINTAINABILITY

Understand how fixing architectural code issues and focusing on the Embold score drives cost of code and maintainability.

BUG FIXING PRIORITIZATION

Embold prioritizes defects by severity and identifies hot spots in your code to guide you in fixing the bugs that matter most.

QUALITY PROCESS IMPROVEMENT

Use the data and insights generated by the rich analytics engine of Embold to design your quality assurance process.

...and many more.

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What's more?
Embold is: TÜV Certified
MISRA C 2012 compliant

ID	Titel
ISO 26262:2011	Road vehicles – Functional safety
IEC 61508-3:2010	Functional Safety of electrical/electronic/programmable electronic safety-related systems, Part 3: Software requirements

14
Customer Case Studies

GLOBAL LEADERS HAVE TRUSTED EMBOLD TO HELP THEM ENHANCE THEIR SOFTWARE – AND THE PLATFORM HAS DELIVERED!

1. Embold as a crucial partner in solving the most challenging software problems for Continental's task forces.

2. Embold As A Core Software Development Platform for Valeo Peiker

3. Embold as a taskforce support platform - Automotive head unit stereo camera

4. Embold As a taskforce support platform - Genivi - Head-up Display

5. Embold Audit - Supplier Software Quality Assessment for Volkswagen

15

Embold and OEM Tier 1 Collaboration – Key Engagements

Embold has supported Continental in solving its the most challenging software problems in Task Forces to secure the SOP date in a very short timeframe in several Continental's programs.

Example 1 : A Radar (ARS) system was analysed for a leading German OEM. Embold was tasked with a software assessment project to support the Task Force. Detailed findings were presented together with in-depth code level recommendations. This help to achieve the SOP goals.

Example 2 : A large program (KaFAS3) for a leading OEM system was analysed. This included static analyses via Embold of all its components. Again detailed findings and recommendations could be presented after a very short timeframe to help secure the SOP

Embold has supported Magneti Marelli in some of their challenging SOP Programs including for Infotainment systems under the Genivi program.

16

Case Study 1

Embold As A Core Software Development Platform for Valeo Peiker.

The problem.

A large automotive supplier wants to fasten the time-to-market and increase the software quality of its products to strengthen its market position .

For this, the R&D department is introducing a modern, state of the art continuous integration platform, with Embold and Jenkins at it's core.

The supplier wants to create a centralized platform for all builds as well as quality control, including quality gates.

Many 3rd party tools need to be integrated to maximize the quality metrics and reports that are available to the developers, including Eclipse, Junit, Clover, Gtest, Gcov, Gerrit.

Different source code management systems need to be integrated, including Git and ClearCase.

Our approach.

Embold consulted the department with regards to the best set up for it's plans, including required software as well as hardware.

To offer first benefits as quickly as possible, Embold set up our platform as soon as the hardware has been available.

With a detailed rollout plan, Embold was extended and customized for the required integrations and reports.

Support is given through weekly calls, as well through ad-hoc meetings and calls when required.

Training is offered to onboard all developers to the new platform and processes as quickly as possible.

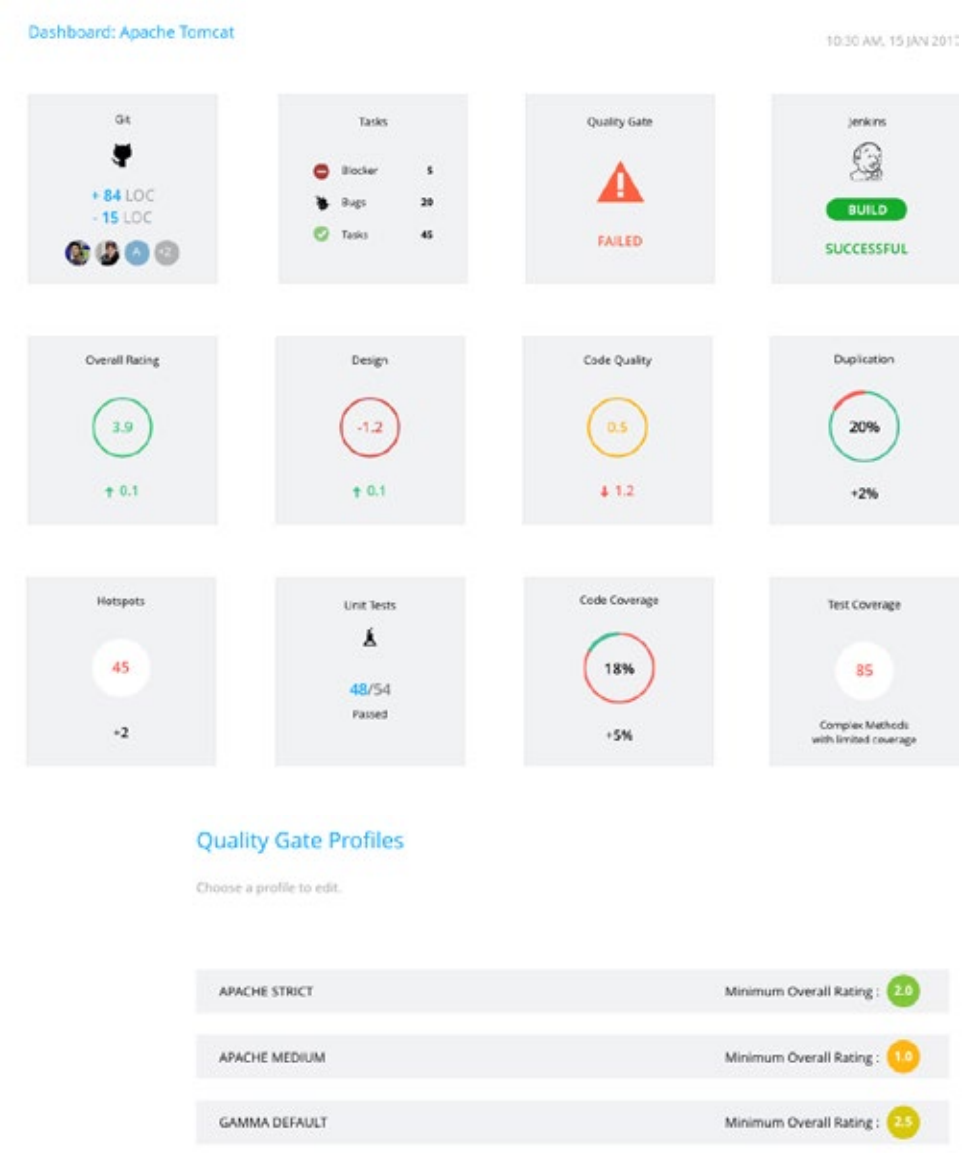
16
Case Study 1
Embold As A Core Software Development Platform for Valeo Peiker.

The outcome.

Embold Is used as a central quality platform for a large set of customer projects, thereby increasing the quality during development and decreasing the required testing time.

The built continuous integration platform became a key differentiator while pitching for projects and during external audits.

As a side effect, All developers in the company are trained on writing high quality software.



17

Case Study 2

Embold as a taskforce support platform - Automotive head unit stereo camera

The problem.

To meet the requirements of Autonomous systems the software supporting them is extremely complex especially in areas related to real-time decision systems on the camera, radar and laser technologies.

Performance, Accuracy and Real-time decisions are paramount requirements for these systems, just like technologies in F1 cars .

The complexity of these platforms are so high that even with a crack team of 400+ engineers and years of experience, building and enhancing integrated software+hardware on these platform has been a challenge for them.

After being in task force mode for a long time and consistent delays in getting reliability out of their software, Embold was called in as an emergency measure, based on strong recommendation from a leading OEM whom we had assisted previously in similar situation.

Our approach.

Embold has successfully concluded the assessment is engaging with the same customer for analysis of similar systems for other car manufacturers.

Two Assessments.

Two Analyses.

The solution

Embold identified 19 critical code components and provided concrete recommendations to fix the identified issues so that the platform can perform as per the of the end customers expectations.

18

Case Study 3

Embold As a taskforce support platform - Genivi - Head-up Display

The problem.

Despite having over 20 vendors and team size exceeding 150 developers, developing / supplying different components, our client's product development team was in Task Force mode for over a year and the team was struggling to get a handle on the complexity of the software stack (over 5 million lines of complex C/C++ code). They were up against a tight deadline (and associated penalty and liability challenges) to deliver the system in time for Start of Production.

Embold was identified to come in (very late in the game) to independently analyse the entire code stack (spread across 8 domains and 2 different processors) and tasked to not only identify the critical components in the code stack, but also provide recommendations to the product team to fix issues, so that the system could be installed in cars in time (the SOP for this stack had already been pushed by the end client by 6 months due to the delay)

Our approach.

Within 3 months our teams (along with our machine) not only diagnosed the critical hotspots in the entire code stack, but we also gave recommendations (code and architecture level), to fix those problems.

18
Case Study 3
Embold As a taskforce support platform - Genivi - Head-up Display

The outcome.

We found over 300 critical issues in less than a week and over 28% of the code were hotspots.

Based on our platform-based services we were able to provide them recommendations to fix the critical hotspots and assist them in achieving the SOP date.

We were able to provide a complete solution to assist the program meeting its SOP targets in less than 4 months.

Before we were bought it, the project was in task force mode for half a year and there were more than 10K critical issues due to the software still open, which had put the entire SOP at risk Embold assisted the client to prioritize the challenges and meet their objectives in an efficient manner.

19

Case Study 4

Embold Audit - Supplier Software Quality Assessment for Volkswagen

The problem.

A large software projects was running for multiple years with the goal to replace a business-critical legacy application.

With each release it became more and more evident that the delivered software did not meet the given business requirements and the supplier was not able to deliver the promised functionality.

Since the development was fully outsourced the client had no profound knowledge or overview on the developed software.

A solution had to be found and decisions to be taken as on how to move forward.

Our approach.

At first Embold was used to analyse the quality of the delivered software system. Special consideration was given to the used libraries, frameworks and tools and their impact on the software quality.

As an outcome, full transparency was given on the state of the delivered system, its quality, maintainability, extensibility, testability and production readiness.

The analysis showed that not only the delivered functionality, but also the quality did not meet the customer requirements and standards. With the help of Gamma alternative ways forward were prescribed and recommendations given.

One of the analysed solutions included combining individual modules and components of the new software with parts of the legacy system.