

Quality Management Operating System [QMOS]



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Introduction

Today, quality issues are largely detected reactively during customer usage in the field, leading to costly warranty and recall campaigns that occasionally put brand reputation at risk. It's not uncommon for automakers to spend over \$1billion per year on total warranty spend. Meanwhile, vehicle components are becoming ever-more complex and interdependent, making quality management more challenging. Connected vehicles are introducing massive amounts of data into the picture — but this data is often left unused, limiting insight generation and issue root-causing.

A new platform is needed in order to proactively address quality by leveraging the power of data and collaboration across OEM and Supplier teams, and to intelligently react to quality problems after long customer usage in the field.





Platform Overview

QMOS is ready to go — out-of-the-box — from within Palantir Foundry.

[Introducing the future of preventative quality management for Automotive:](#)

With Palantir's Quality Management Operating System — QMOS— an out-of-the-box application within Palantir Foundry, leading OEMs and suppliers can integrate relevant data from connected vehicle telematics, warranty claims, suppliers, dealers, and more, to provide a holistic and actionable view of quality.

QMOS leads directly to faster issue identification and resolution. The application achieves this by creating a digital twin (or ontology) of data across organizations and functions. Quality is therefore able to be managed proactively in the face of increasing data complexity. Layering multiple internal and external sources of data under a single operating picture, QMOS performs a myriad of critical functions for state-of-the-art, data-driven quality management:

- [A secure data foundation and ontology](#), or digital twin, for collaborative and operational decision-making
- [Claim processing](#) including NLP based tagging and [claim classification](#) with both user defined & AI based rules
- [Failure cluster management](#) enabling root cause analysis across multiple internal and external sources of data in a single operating picture
- [Field monitoring and telematics](#) using Palantir's Component Performance Monitor
- [Mitigation and write-back](#) to core systems

By wielding Foundry's ontology (the digital twin), quality-related data can be managed proactively, despite increasing data complexity across organizations and functions in the automotive industry.



An introduction to Foundry

How everything comes together:

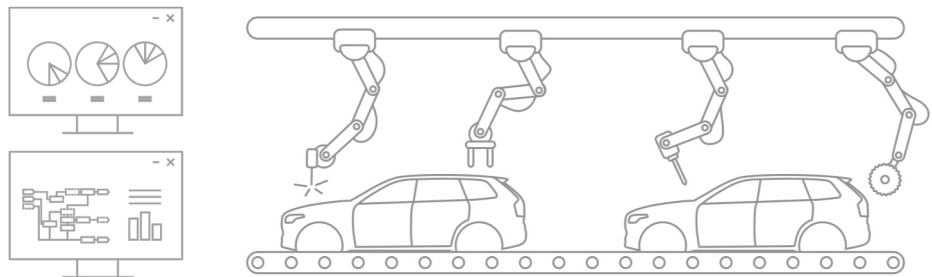
QMOS is built upon Palantir Foundry, a common platform where organizations can securely analyze, operationalize, and share disparate data in a standardized format and collaborative environment. Many of the world's most critical organizations trust Foundry for secure data sharing and decision-making, including some of the largest OEMs and suppliers.

Palantir QMOS is an out-of-the-box proactive quality manager. It is highly configurable, fully able to fit OEMs' and suppliers' existing and envisioned business processes, either as an end-to-end quality management solution or to fill relevant gaps in existing processes.

Leveraging Foundry's robust interoperability features, QMOS integrates closely with existing architectures and ingests from and writes back to core operational systems such as ERP or QMS systems without the need to replace them.

Liam Mawe, Global
Head of Automotive &
Mobility at Palantir —

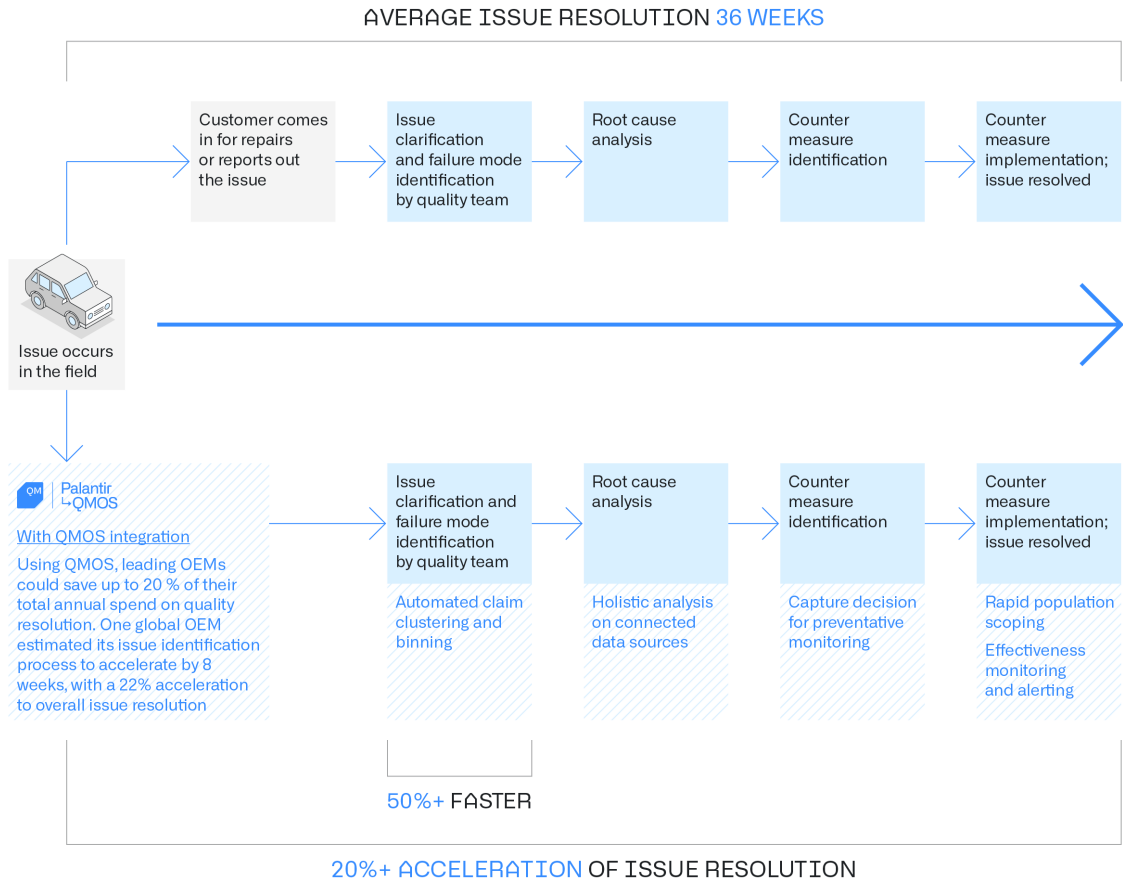
— “Fundamentally, QMOS reduces time to identify, investigate, and root-cause issues — then helps prevent those issues from happening in the future.”





A common QMOS workflow

Introducing the future of preventative quality management for Automotive:



Data presented above comes from multiple QMOS use-cases at major OEMs.



Understanding the QMOS Ontology

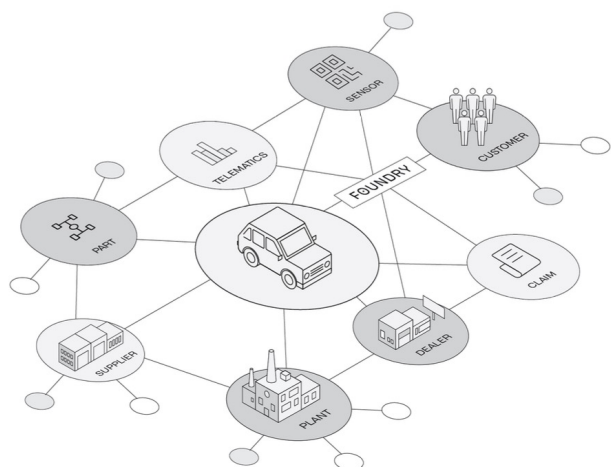
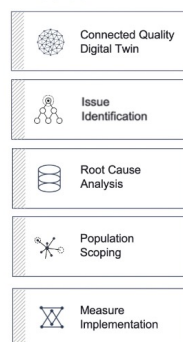
With QMOS, close the quality loop with a single standardized quality data foundation, and source of metrics across departments at the OEM and supplier level. QMOS can turn a complex quality data landscape into a common language, or ontology, that everyone can trust and safely collaborate on.

The QMOS Ontology is used not only to read data across multiple systems, but also to write data back and capture decisions made by users. It enables significant economies of scale in the construction of an operational platform by helping to converge effort onto a single reusable data asset that supports all analytical work and application development.

The Ontology sources its data from:

- Warranty and goodwill claims
- Diagnostic trouble codes (DTCs) from dealer readout
- Telemetry data including DTCs, sensor and environmental conditions data
- Over-the-air and dealer-issued software version updates.
- Vehicle data, ranging from vehicle configuration data, supplier information, and production data such as end of line tests
- Part replacements and investigation data
- Aftersales call centre data

Enabling:





Claims Processing and Classification

CHALLENGE

Today, quality issues are often detected late (often, over 15 weeks after the fact) and / or reactively. Crucial time is therefore often lost that could've been spent resolving the issue. Claims are often processed manually, days or even weeks after they were filed, without systematic learning in place to find patterns and detect underlying problems.

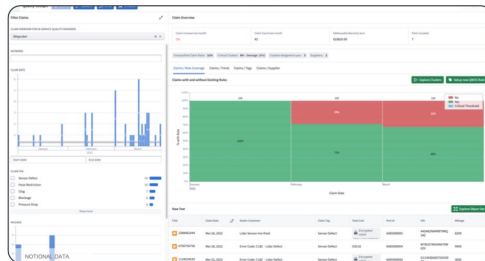
SOLUTION

With QMOS, incoming claims are automatically classified based on user defined or automatically generated rules using the QMOS no-code rules engine, so that quality service engineers can focus on new, unknown problems while tracking trends with existing problems in real-time. Natural language processing (NLP) is used for claim tagging to automate claims clustering.

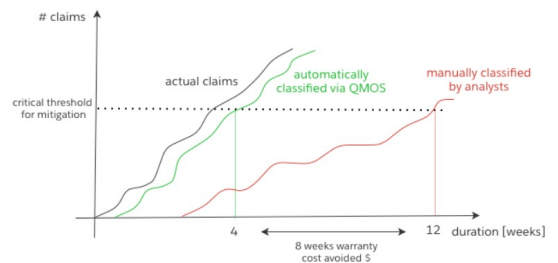
IMPACT

At one flagship European OEM, with QMOS and Foundry, the average issue identification and verification process was accelerated by 8 weeks or 50%. Moreover, within 8 weeks of the pilot, 37% of claims were classified in an automated way, freeing up time that had previously been painstakingly spent manually categorizing warranty claims across the global fleet. At another OEM, quality teams automated 40% of claims within one week of deploying QMOS.

The no-code rules engine means user defined rules can be set up on top of any integrated data source. QMOS also rapidly decreases time to identify new issues, while making sure that quality leadership has an accurate picture of current trends and focus areas.



Reduction in quality issue time identification





Cluster Management and Mitigation

CHALLENGE

It's not uncommon for Quality issues to be managed reactively, and only where data sources are combined upon request and based on existing hypotheses. For example, connected vehicle data such as diagnostics and sensor data are seldom used since the tools suitable to handle the large data size are unavailable, or they are siloed and not combined with other useful data sets (such as claims or vehicle configuration information). The potential impact of a quality issue is therefore largely unknown, rendering estimates inaccurate.

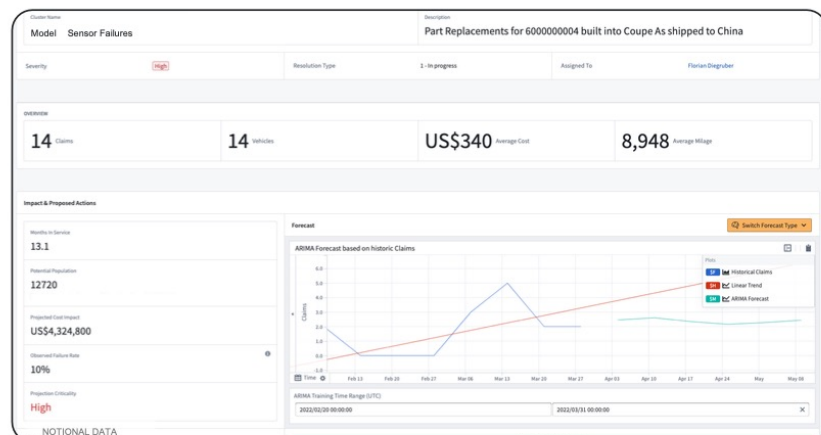
SOLUTION

Every new quality cluster generated automatically utilizes the quality ontology and provides a detailed overview of the potential field impact and proposed actions. Investigating and identifying critical DTC patterns are used to form early warning systems. These clusters are also enriched using DTC patterns which are then used to monitor the fleet of connected vehicles to identify unknown issues early.

IMPACT

Palantir worked alongside a flagship OEM's operational teams and together identified potential savings of upwards of €190 per vehicle on warranty spend with the help of QMOS. Thus, impact estimates can be run using both production as well as vehicle telematics data to apply identified symptoms to the global fleet in order to take relevant actions.

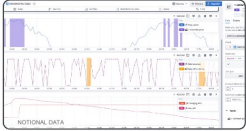
With quality knowledge management, close the quality loop by capturing standardized quality data and metrics across business units, including Cost of Non-Quality, 8D reports, and failure patterns. With QMOS, reporting feeds operational decision-making.





Field Monitoring and Telematics

CHALLENGE



Hidden in vast quantities of vehicle telematics data are valuable insights regarding the performance of vehicles and components. In real time, sensors are registering information regarding temperature, speed, pressure, and more. By integrating and analyzing the data for meaningful connections, trends and patterns can be revealed to help improve component reliability and vehicle quality.

SOLUTION



With the out-of-the-box application, QMOS, vehicle telematics can be seamlessly integrated into quality management processes. Users can manage large vehicle cohorts at scale with operational tools built right from vehicle IOT sensor data. They can monitor and improve the performance of individual vehicles by tracking symptom occurrence or by comparing the historical performance of vehicle groups. Additionally, vehicle cohorts can be actively monitored using the Component Performance Monitor — an ecosystem for OEM and supplier collaboration — enabling secure collaboration between suppliers and OEMs on top of a shared data basis.

[More information on the CPM can be found here, including a full video overview.](#)

IMPACT

A large European supplier used CPM traceability enabled precise issue identification, reducing the number of affected vehicles and potential cost by 98.5%. Precise down scoping of the affected vehicle fleet from initially 2 million vehicles to 35 thousand vehicles. Reduction in quality cost: €490m to €8.5m.

By analyzing large scale field data in CPM, a supplier down scoped potentially affected vehicles of a breaking quality issue by 99% and consequently avoided a costly warranty extension of ~€20m. First analysis results were achieved after days compared to months without CPMs capabilities. Precise down scoping of the vehicle cohort was from 1.4 million vehicles to 15 vehicles.



Conclusion

[Revolutionizing quality management through data:](#)

Despite receiving terabytes of field quality data from connected vehicles, automotive companies lack the tools to make this data usable for warranty analytics and cross-company quality management. QMOS changes that paradigm with a new end-to-end preventative quality management solution — for connected and non-connected vehicles — that is set to transform the automotive industry. Moreover, being an out-of-the-box application, it is rapidly deployed across OEM's entire fleet showing actionable results quickly.

Based on Palantir's Foundry platform — our operating system for the modern enterprise — QMOS is inspired by our company's 15+ years of cross-industry learnings across 100+ deployments. Now, companies collaborating under a shared data fabric using Foundry are pioneering the future of mobility and uncovering new opportunities to generate economic and social value through data.

QMOS can be a gateway for implementing data-driven insights and operations into every-day decision-making, but Foundry can go much further — opening the door for use-case development far beyond quality, from supply-chain management, to net-zero solutions.

[Join the automotive and mobility revolution today.](#)





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