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# Integrated Automotive Quality Management with Palantir

## Introducing the Quality Management OS

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Solutions Overview
Technical Whitepaper

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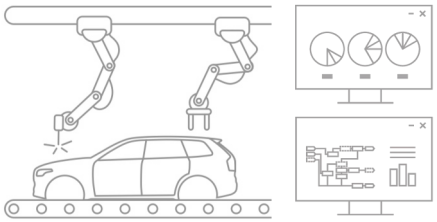
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# Platform Overview

## The future of quality management for automotive →



Today, quality issues are often detected *reactively* during customer usage in the field, leading to costly warranty and recall campaigns that can put OEM 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 more complex and interdependent, making quality management 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 to proactively address quality by leveraging the power of data and collaboration across OEM and supplier teams.

## Introducing ↘

QM | Palantir ↳QMOS

With Palantir's Quality Management Operating System (QMOS), leading OEMs and suppliers can integrate relevant data from connected vehicle telematics, warranty claims, Tier 1 and Tier 2 suppliers, dealers and more to provide a holistic view of quality — leading to faster issue identification and resolution. By creating a digital twin, or ontology, of data across organizations and functions, quality can 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 multiple critical functions for state-of-the-art, data-driven quality management:

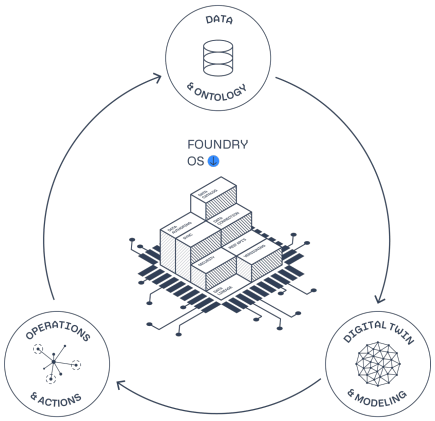
"By creating a digital twin, or ontology, of data across organizations and functions, quality can be managed proactively in the face of increasing data complexity."

- → 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

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# Introduction to Foundry



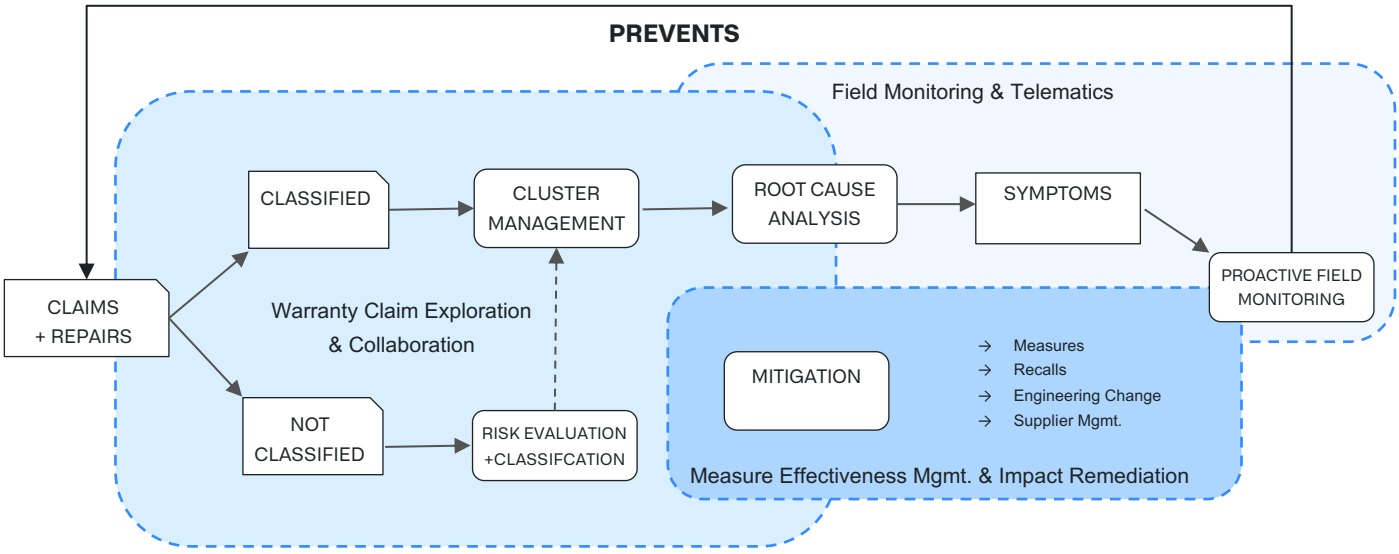

QMOS is built upon Palantir Foundry, a common platform where multiple organizations can securely analyze, operationalize, and share disparate data in a standardized format and collaborative environment. Many of the world's most critical organizations trust Foundry for secure data sharing and decision-making,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

QMOS is rooted in Palantir's 15+ years of experience supporting secure data and workflow sharing in mission-critical environments, in addition to years of development knowledge with automotive companies building an end-to-end quality solution. It offers the technical and organizational elements OEMs and suppliers need to revolutionize quality in an ever more complicated, connected, and competitive automotive ecosystem.

## How everything comes together→

Palantir QMOS can be customized 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. With QMOS, reduce time to identify, investigate, and root-cause issues — then prevent those issues from happening in the future.

A common QMOS workflow is represented below:




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# The Ontology

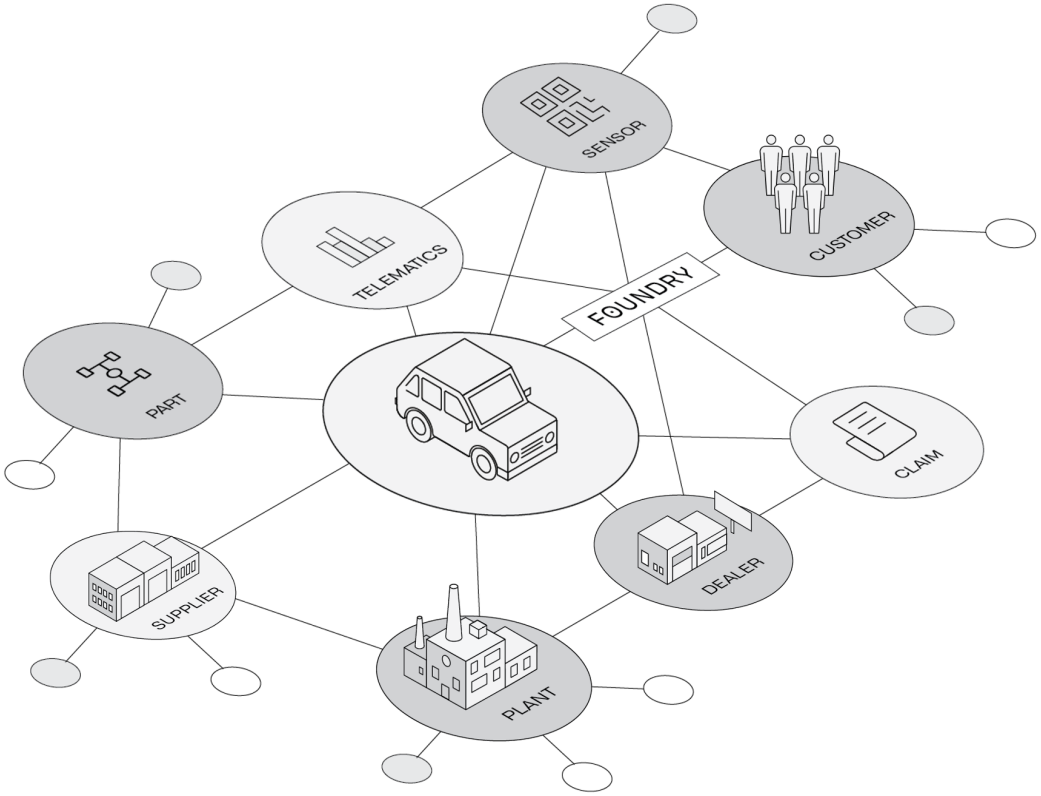
“ QMOS stems from Palantir’s 15+ years of experience supporting secure data and workflow sharing in mission critical environments, in addition to years of development knowledge with automotive companies building an end-to-end quality solution. ”

With QMOS, share metrics across departments at the OEM and supplier level by turning a complex quality data landscape into a common language, or ontology, that everyone can trust and safely collaborate on. Then, close the quality loop with a single standardized quality data foundation and source of truth that writes data back and captures decisions made by users.

By converging efforts across the enterprise onto a single reusable data asset that supports future analytical work and application development, QMOS enables significant economies of scale.

Enables →

- Connected Quality Digital Twin
- Issue Identification
- Root Cause Analysis
- Population Scoping
- Measure Implementation




With a single source of truth, the Ontology enables business users to easily discover and understand the data available across their business as well as view their local decisions in a more global context, providing connectivity at scale.

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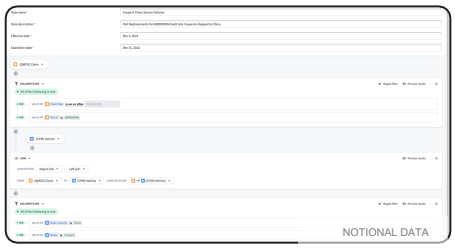
# Claims Processing & Classification

## Challenge →

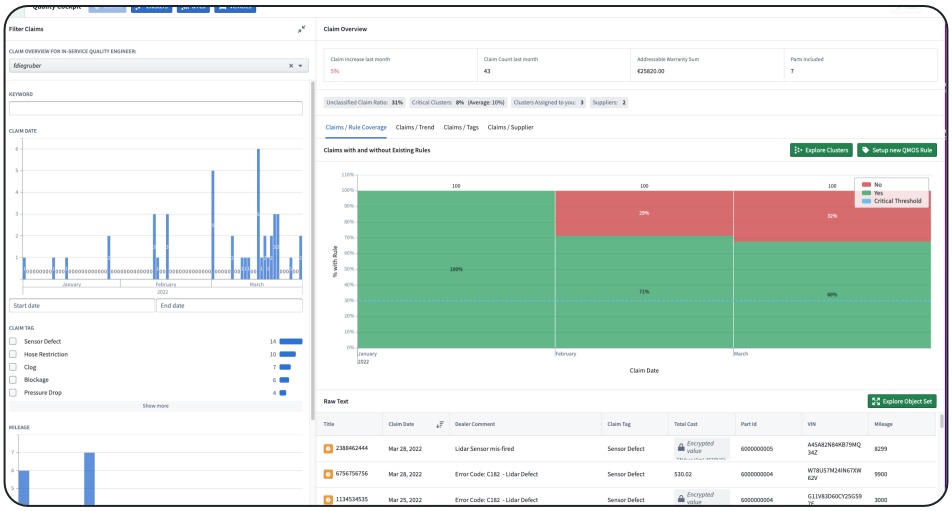
Today, quality issues are often detected reactively, and valuable time for mitigation is lost by focusing solely on known hypotheses to solve problems. Claims are often manually processed days or even weeks after they occur.

## Solution →

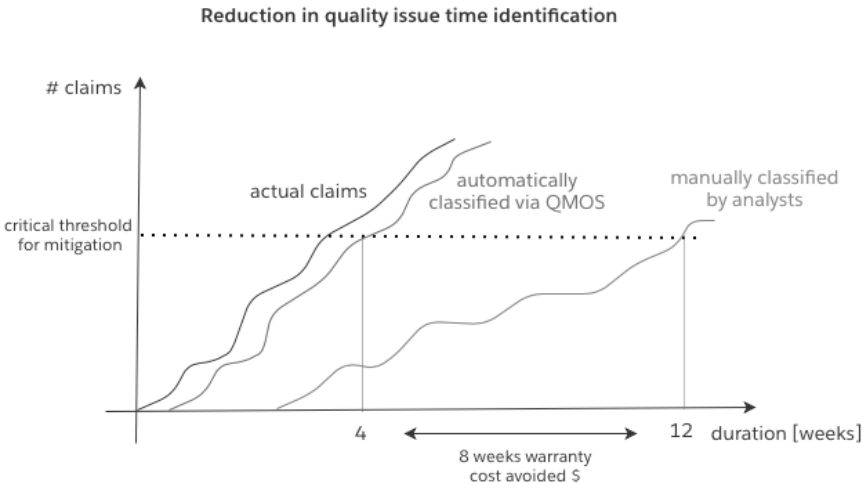
With QMOS, incoming claims are automatically classified based on user-defined or automatically-generated rules, so that quality service engineers can focus on new, unknown problems while tracking trends with existing problems in real-time.




User defined rules can be set up with the QMOS no Code Rules Engine on top of any integrated data source. This enables proactive scoping of all incoming quality issues and correct classification.




QMOS rapidly decreases time to identify new issues, while making sure that quality leadership has an accurate picture of current trends and focus areas.




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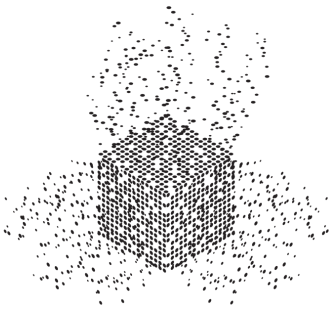
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# Cluster Management and Mitigation

## Challenge →

Quality issues are often managed reactively, and only where data sources are combined upon request and based on existing hypotheses. Therefore, the potential impact of a quality issue is mostly unknown, and estimates are inaccurate.

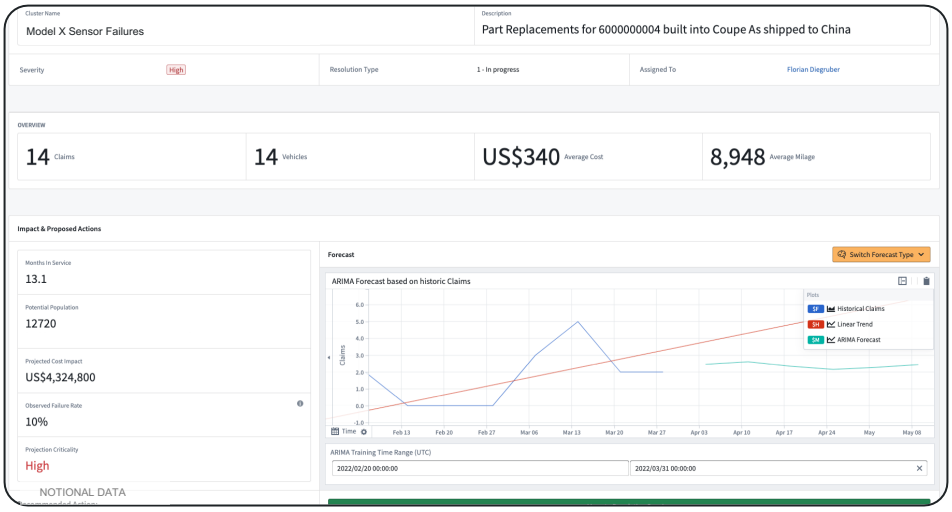
## Solution →



With QMOS, teams can collaborate on new or increasing quality issues while estimating the potential future impact using production information or projecting models.

With QMOS, leading OEMs are integrating all relevant data sources into a single operating picture allowing cross-department collaboration on identified quality issue clusters. Every new quality cluster generated automatically utilizes the quality ontology and provides a detailed overview of the potential field impact, and proposed actions to resolve it.

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 appropriate actions.



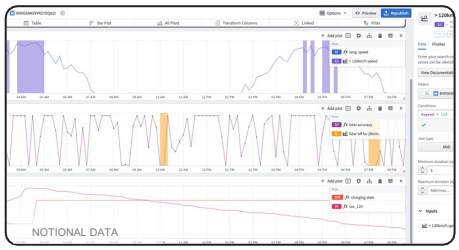

With quality knowledge management, close the quality loop by capturing standardized quality data and metrics across business units, including Cost of Non-Quality, 8D reports, and failure patterns. With QMOS, reporting feeds operational decision-making.

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# Field Monitoring & Telematics

## Challenge →

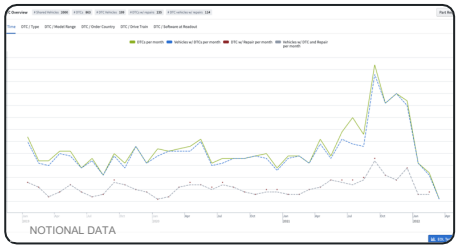



Vehicle Sensor Analytics

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 →




The Component Performance Monitor offers a secure ecosystem for collaboration across OEMs and their Suppliers.

With 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.

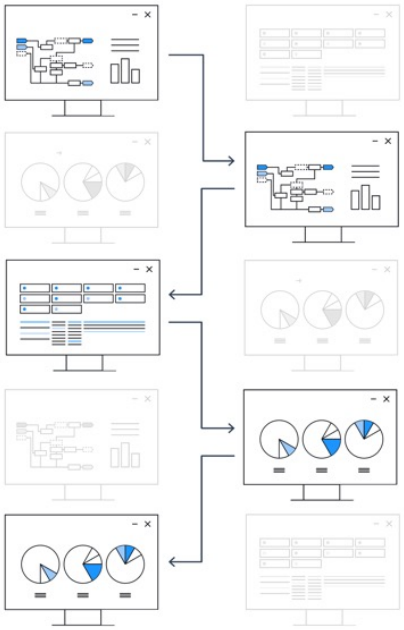



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# Conclusion

## Revolutionizing mobility 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 solution for quality management — for connected and non-connected vehicles — that is set to transform the Automotive industry.

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. Learn more about our Automotive offerings and join the automotive revolution today.


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Shape the Future of Automotive...

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