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oilQuad

Measure engine oil viscosity for efficient tracking of engine health

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oilQuad
MEASURING PRECISION, POWERING PERFORMANCE

What is oilQuad ?

oilQuad represents an innovative system featuring a bespoke viscometric device designed for the precise determination of optimal car oil change intervals. This intelligent system seamlessly transmits crucial data to a shared cloud infrastructure, enabling authorized individuals to access and analyze this information. Through informed insights on oil condition and performance trends, pertinent actions can be taken promptly, enhancing the overall maintenance and longevity of the vehicle.

Deciphering the Business Conundrum

- Frequently, the automotive industry relies on the conventional practice of adhering to fixed time intervals for car engine oil changes in the pursuit of performance enhancement.
- However, this time-based approach, while deeply ingrained, reveals shortcomings in terms of efficiency, potential harm to the vehicle's performance, and an associated financial burden.
- A pressing concern emerges from the fact that engine oil may not consistently demand replacement strictly according to predetermined intervals.
- This inconsistency raises questions about whether an immediate oil change is necessary to uphold the vehicle's optimal performance levels, calling for a reevaluation of this conventional practice.

Avoiding the Issue: Potential Outcomes

- **Financial Burden**: Neglecting an efficient oil change method can lead to unnecessary costs as frequent, unnecessary oil changes strain the budget of car owners.
- **Environmental Impact**: Overuse and disposal of engine oil contribute to environmental pollution, harming ecosystems and public health.
- **Resource Wastage**: Unnecessary oil changes result in the wastage of oil resources, which are finite and valuable.
- **Inefficient Maintenance**: Inaccurate oil change intervals can lead to inefficient maintenance practices, impacting the overall performance and longevity of the vehicle.
- **Consumer Inconvenience**: Frequent oil changes disrupt car owners' schedules and result in inconvenience, affecting their daily lives.

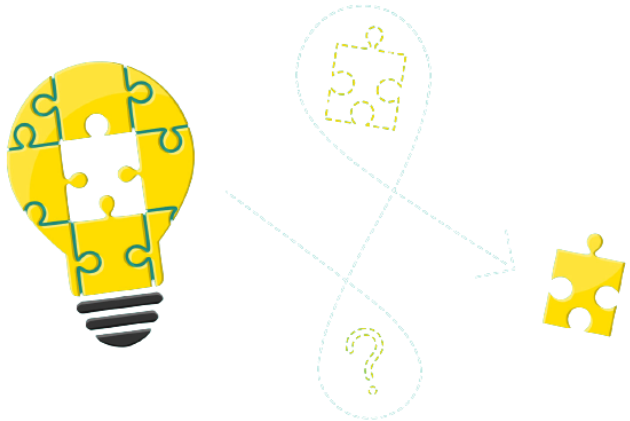
Key Stakeholders

- **Vehicle Owners**: Owners play a central role as they are directly impacted by oil change decisions and need to maintain their vehicles efficiently.
- **Automotive Manufacturers**: These manufacturers can influence oil change guidelines and contribute to developing technology for more precise interval determination.
- **Oil Producers**: Oil companies play a crucial role in offering products that align with changing intervals and environmental standards.
- **Environmental Agencies**: Environmental regulators ensure that oil change practices are environmentally responsible and adhere to guidelines.
- **Service Centers, Technology Developers, and Insurers**: These entities provide the expertise, tools, and services needed to implement efficient oil change strategies and help vehicle owners make informed decisions.

Addressing the Challenge

The proposed plan entails the integration of Thermal Sensors within the engine oil tube to facilitate the continuous measurement of oil viscosity and temperature levels at regular intervals, enabling real-time monitoring and data analysis.

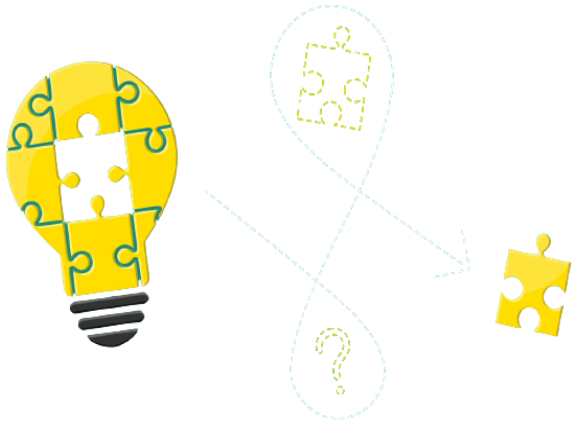
- **Utilizing Heat Transfer**: Thermal Sensors are deployed to measure oil viscosity by employing the principles of heat transfer. These sensors apply heat to a specific element and gauge the rate of cooling as oil flows through it. The rate at which heat dissipates or is conducted away by the fluid provides a precise measure of viscosity.
- **Sensor Composition**: The Thermal Sensor comprises a heating element and a temperature sensor, such as a thermistor or RTD. The heating element initiates the heating process, while the temperature sensor records the rate of cooling or temperature change, delivering a comprehensive assessment of oil viscosity.



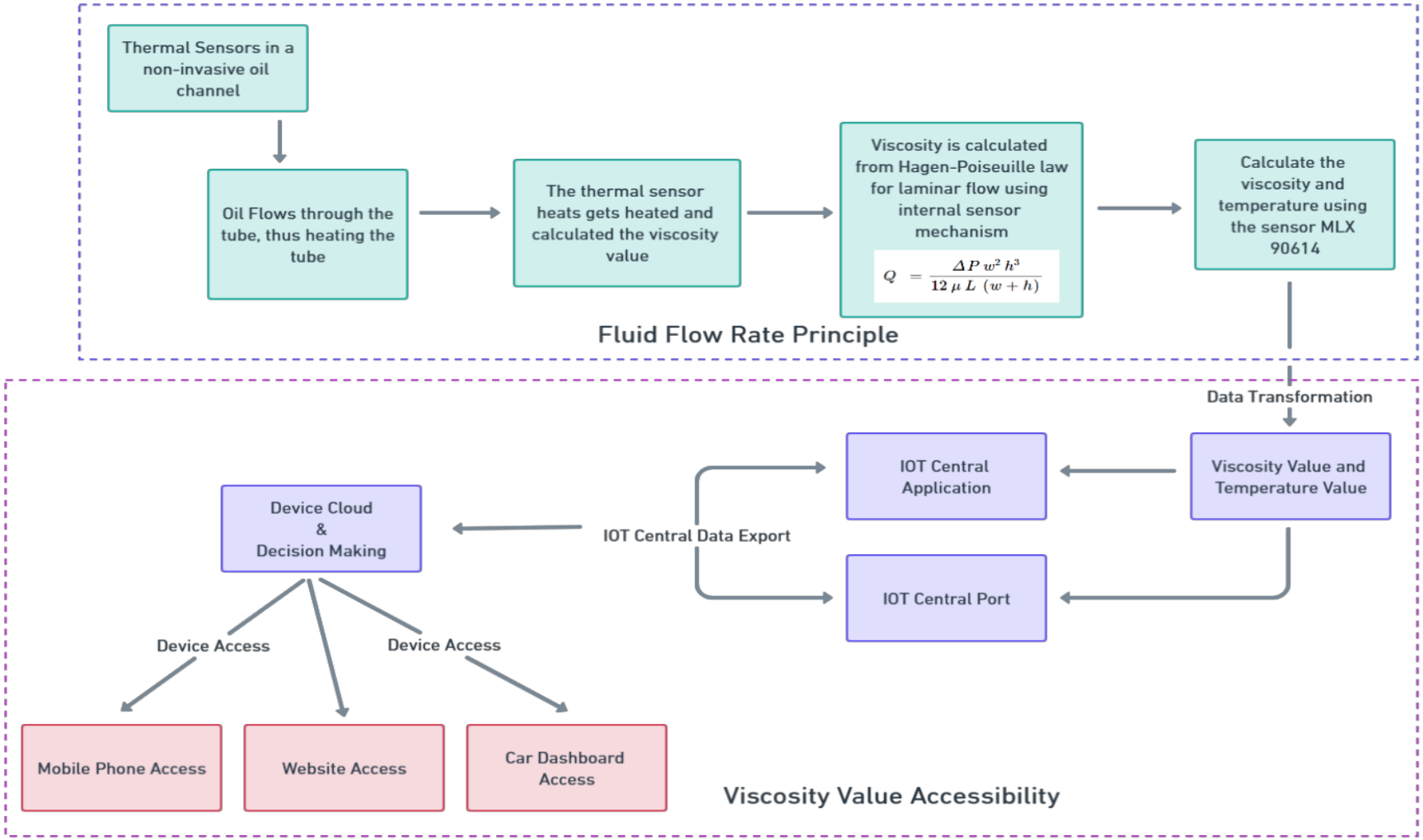
Addressing the Challenge - II

- **Viscosity and Fluid Characteristics**: Viscosity directly correlates with fluid characteristics. More viscous fluids exhibit slower heat conduction and temperature change compared to less viscous ones. Understanding viscosity is vital, as it impacts lubrication effectiveness, particularly in cold and hot engine conditions.
- **Effect of Temperature**: Heating of the oil causes oxidation, which, in turn, influences the oil's viscosity. Temperature-induced viscosity changes can significantly impact engine performance.
- **Data Transmission and Analysis**: The Thermal Sensors transmit data to the primary microprocessor integrated within the car's internal system. Subsequently, the microprocessor conveys the data to a shared cloud in a user-friendly format. This shared cloud serves as a repository for historical data, allowing for the assessment of engine oil viscosity against established ratings (e.g., 10W, 30) for both hot and cold conditions. Notifications are then generated for car owners and dealerships, enabling timely action to be taken in response to changing viscosity levels.

This comprehensive proposal outlines a sophisticated system for real-time oil viscosity monitoring, aimed at enhancing vehicle performance and maintenance efficiency.



Architectural Framework of the Proposed Solution



System Setup Procedure

- Installation of a viscosity sensor within or external to the car engine oil tube through non-invasive techniques to facilitate the measurement of oil viscosity and temperature.
- Acquisition of signals from these sensors and their transmission to a dedicated microprocessor.
- Integration of the microprocessor within the vehicle's internal system to facilitate the transmission of collected data to a shared cloud platform.
- Establishment of a shared cloud infrastructure for data storage and accessibility.
- Data retention in the shared cloud, with notifications provided to both the car owner and dealership based on the car engine oil viscosity rating (e.g., 10W, 30), which includes values for both hot and cold conditions. Notifications are triggered based on the historical trends in oil viscosity, prompting necessary actions as warranted.

Thank You