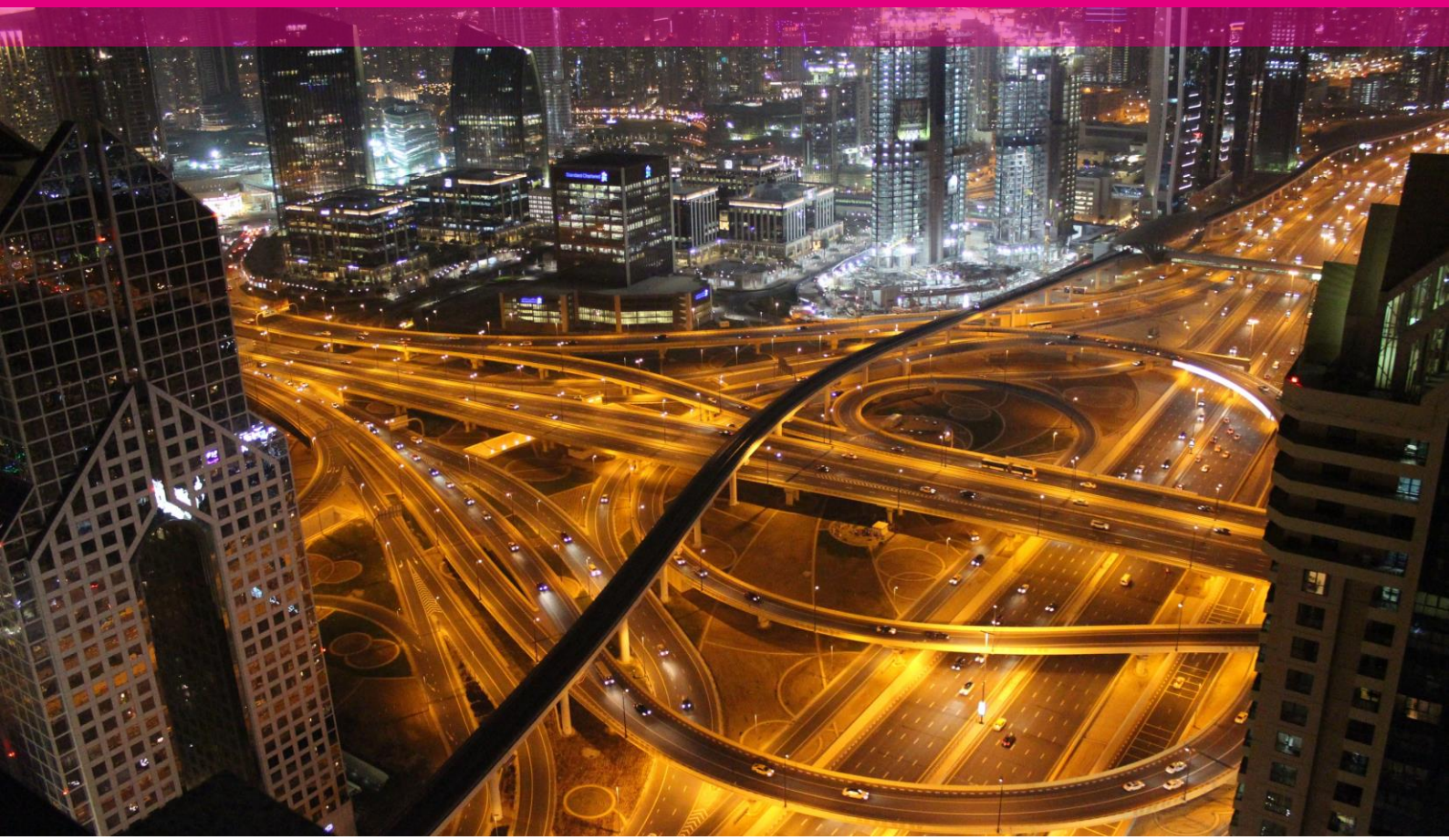
CONNECTED CAR CHALLENGES
END2END LIFECYCLE MANAGEMENT IN A VEHICLE OPERATION CENTER



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ADOPTING A HOLISTIC LIFECYCLE PERSPECTIVE OFFERS NEW GROWTH POTENTIAL FOR DIGITAL SERVICE PROVIDERS.

Digital services in the automotive industry

Automotive revenues and profit pools are shifting. Although presently vehicle sales are still the dominant revenue driver, large swaths of the automotive industry are turning towards digital services as their next big field of play. This move has various implications – the need to build up digital skills and capabilities, the adoption of agile tools and methodologies, the creation of new sales channels and ownership models. All of these well-known industry trends point to an underlying development towards a more comprehensive lifecycle management. A car is not just bought and sold anymore, with nothing but a few maintenance visits in between. Its daily usage by one or multiple customers provides valuable opportunities for interaction and analysis along the way. Business opportunities are transforming from distinct events (the launch of a new model, the sale of an individual car) into continuous processes (a service subscription, premium add-ons, micropayments). And with opportunity comes risk – the customer may have driven their new car off the lot, but what if they happen to dislike a particular premium service? What if they discover bugs and glitches? What if they completely ignore the vehicle's infotainment system and focus on their smartphone instead?

The importance of lifecycle management

Moving beyond these hypotheses and high-level visions requires more than innovative features and eye-catching apps. Automotive OEMs need an integrated lifecycle management to succeed in the digital service world. Monitoring large-scale fleets, rather than evaluating prototypes and test vehicles in a lab. Measuring customer satisfaction, rather than engaging in guessing games with dealership representatives and focus groups. These activities will be key success drivers for future automotive players.

To manifest these successes, we recommend that OEMs and connected car providers establish a dedicated lifecycle management toolchain – the Vehicle Operation Center.

Automotive lifecycle segments

Naturally, any approach at lifecycle management first requires an understanding of the particular industry and market conditions. What are key drivers and activities along the automotive lifecycle? Adopting a high-level view, one can distinguish between three main focus areas or phases:

- Product Development
- Fleet and Platform Operations
- Customer Experience

First off, the development phase. This could apply to a vehicle prototype, a specific electronic control unit, a backend platform , a mobile app or particular digital service. There are a variety of development projects involved in the delivery of any given product or service handled within the automotive industry. While they may vary in their specific development tasks, degrees of interdependence between each other and interactivity with customers and stakeholders, they typically follow a basic pattern of ideation, prototyping, requirements engineering, implementation and validation. Implementation itself may happen in stages or evolutions, but is usually separated from operations and maintenance activities, e.g. for long-term platform support. While development has always been reliant on some degree of feedback from the operational domain, this link is developing into an increasingly significant enabler. Data-driven and customer-centric development are gaining importance and momentum. Both are heavily dependent on a mixture of technical sensor data, environmental data and customer feedback. Providing these necessary datasets is often quite difficult, typically due to either insufficient collection, low quality, incompatibility or simply a lack of underlying system integration.

Development	Operations	Experience
Designing and implementing new vehicles, services and platform features.	**Managing** customer-facing vehicle **fleets, applications and platform services**.	Data-driven monitoring and improvement of **customer value and relationship**.

INTERSECTIONS BETWEEN DEVELOPMENT, OPERATIONS AND CUSTOMER EXPERIENCE ARE CRITICAL SUCCESS FACTORS.

Overcoming these challenges depends on novel approaches to fleet operations, tooling and customer interaction.

Operating connected vehicle ecosystems

Next up, there is the operational domain. Much like automotive development, operations are multi-faceted, combining activities such as vehicle, fleet and platform operations. While individual vehicles are typically under the responsibility of their owners, their operations phase still requires some effort on the part of the OEM, either through the orchestration of workshop visits or, more recently, the provisioning of software updates and platform services, as well as the underlying cellular connectivity. Taken to a macro level, this translates to an overall fleet management, for instance by monitoring the general maintenance status or the most prevalent software versions in any given market, or administering large-scale update campaigns to ensure the availability of the most recent software. These activities are typically enabled by digital platform components, such as device and campaign management services. Accordingly, operations in the automotive sector span across a wide variety of platforms, domains and digital services. While not always essential for ongoing operations, interaction between development and operational teams and domains is essential for continuous improvement of the overall system. Likewise, there is a direct relationship between customer experience and operational tasks. Well-executed operations typically lead to a more stable and consistent customer experience. The reverse is also true – a lack of operational excellence will likely lead to a decrease in overall customer satisfaction. Accordingly, well-integrated operational capabilities should be a key concern of any automotive OEM.

Managing customer interaction and experience

Finally, we arrive at the actual customer experience. This domain is primarily concerned with customer interaction – how do customers and users (i.e. potential future customers) perceive the OEM's product and service offerings? To which extent are they willing to invest time and money into these offerings? And how do they continue to interact with them once an initial investment has been made?

Embedding customer experience in the connected vehicle organization

Naturally, these are key questions for automotive providers, considering their focus on offering attractive products and services, growing their revenues and achieving efficiency gains. Nevertheless, experience is clearly the least understood and formalized domain when compared to development and operations. While tremendous technical and operational capabilities are often readily available, a direct, comprehensive line to the customer is usually relegated to traditional marketing departments. This is unfortunate, because much like the development and operational domains, customer experience stands to benefit tremendously from a consistent, integrated management framework. Understanding and influencing customer satisfaction is key towards sustained success in an increasingly self-consolidating market. Limiting these activities to a few customer-facing organizational units and entities is insufficient for a sustained impact, since development and operations pre-shape and influence the entire customer lifecycle.

Increasing parallelization of domain activities

Having had a closer look at these 3 domains, it becomes apparent that while theoretically they do constitute a succession of phases (something needs to be developed before it can be operated and customers can only start using a product or service once development and operations are in place), each domain is in fact heavily reliant on the others for maximum effectivity and efficiency. Accordingly, rather than conceptualizing them as phases, they should be treated as macro-activities which run in parallel (or at the very least with significant overlaps) throughout the overall product- and service lifecycle.

AN INTEGRATED VEHICLE OPERATION CENTER ENABLES CONSISTENT AUTOMOTIVE LIFECYCLE MANAGEMENT.

Vehicle Operation Center

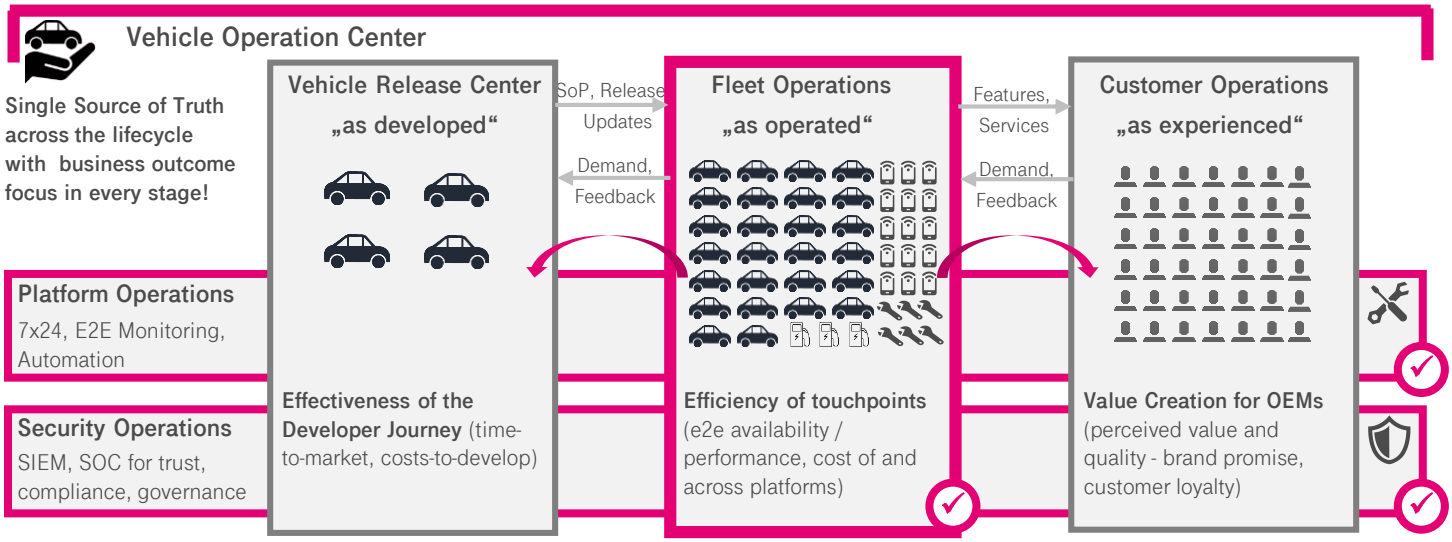
The benefits of integrated lifecycle management are clear. Despite this, the concept has yet to be implemented by the automotive industry. Which leads us to the question of feasibility. Are current systems simply not up to the task of providing this level of detailed analysis? Is the automotive product landscape too complex to allow for a common analytics framework?

As always, there are certain nuances to this question. It would be incorrect to claim that there are no suitable automotive analytics frameworks. In fact, there is quite a high number of specialized automotive analytics processes and customized toolsets out there. The issue is that these frameworks are typically specific to their target domain. An analytics framework for CAN bus data extraction will differ significantly from a system focused on digital service usage and customer satisfaction measures. At the same time, creating an entirely new system to serve all automotive domains can hardly be the answer. Relevant datasets and business processes already exist. Trying to unify them into a single platform is bound to create extreme redundancy as well as significant operational overhead and will most likely result in spectacular failures. The real question is one of integration – ensuring that borders between different systems remain permeable, allowing for cross-domain analysis and interaction. Vehicle Operation Centers solve this issue by establishing interfaces to all relevant platform components, thereby providing a complete picture of the entire connected mobility lifecycle.

At its core, a Vehicle Operation Center (VOC) is a flexible analytics suite, enabling its users to gain deep insight into various aspects of automotive product- and service lifecycles. In addition, it provides the necessary capabilities to influence all lifecycle segments through interfaces with relevant components and an automated workflow management engine. By virtue of its interconnections with other systems, the VOC serves as a central overview of the entire connected vehicle ecosystem, while also providing an entry point into the different business processes within this system.

Context-sensitive information displays

One key characteristic of the VOC is its ability to provide users with relevant context information through a number of micro-frontends. Users receive the reports that are required for them to fulfill their role and execute their assigned tasks. For instance, customer experience stakeholders may be particularly interested in fleets of individually owned vehicles, whereas development stakeholders require detailed log data from a dedicated fleet of test vehicles. The VOC frontend changes to meet these use cases, aggregating and visualizing relevant datasets as required by the specific stakeholder. Within the complex automotive ecosystem, this flexibility is absolutely essential in order to ensure a complete overview and enable in-depth analytics throughout all phases of the customer and product lifecycle.



CONTINUOUS LIFECYCLE MANAGEMENT HELPS TO ASSESS AND EVOLVE CUSTOMER IDENTITIES AND REQUIREMENTS.

Lifecycle and identity management

The ability to track, analyze and react throughout all relevant lifecycle segments is a key requirement for any customer-facing digital service business. There are many instances of this principle in automotive and other industries. Issues surrounding Customer ID management provide a particular fitting example.

Simply put, a Customer ID is relatively useless without any datasets associated to it. While this might seem trivial at first glance, it is actually a relatively complicated issue. In the automotive industry, customers are identified in various ways – through VINs, full names in dealership CRM systems or an email address in the OEM web portal. As a result, there are multiple, fragmented identities covering a single customer – notwithstanding all of the friends and family members that might be partially included in this identity if they happen to borrow the customer's vehicle.

Extending customer identity

While automotive identifiers are certainly useful, they fail to fulfill the potential of a single identity that connects all available data sources and processes. And although initiatives to achieve a consistent, unified customer ID have already been underway for quite some time, an end-to-end view into the various lifecycle segments of a given customer ID is still very hard to come by. A use-case-driven approach is needed to unlock the full potential of a unified customer ID, both from the perspective of analytical capabilities and business value creation. This is precisely what the VOC provides – a modular platform to build analytical use cases and funnel newly gained insights directly into the appropriate business processes to increase efficiency and create added value for customers, partners and internal clients.

As use case and process automation matures, this frees up resources for an iterative integration of additional platforms and services into the VOC, eventually encompassing the full automotive system landscape.

Use case overview

New platforms and services should be centered primarily around customer- and business needs. As these needs vary between different OEMs and their respective customer segments, the VOC allows for maximum flexibility and customization through intuitive onboarding of use cases and business processes. Users are given the option of defining and automating their individual use cases and workflows on-demand, thus enabling rapid low- and no-code implementations. Accordingly, the following use cases should be understood as a series of examples, rather than a fixed VOC scope.

VOC for development teams

For teams engaged in the development domain, the Vehicle Operation Center provides a structured environment for continuous interaction with vehicle and device fleets. These may be dedicated testbenches or test fleets, but also productive vehicles and devices already under regular customer usage. This enables not only a consistent fleet-level release management, but also various other development-related use cases such as targeted data collection, user-centric planning and prioritization, hybrid testing fleets etc.

Targeted data collection

Vehicle functions are increasingly data-driven. Examples for these include automated driver assistance features, but also natural language processing or general anomaly detection. Access to representative datasets from real usage scenarios is key to train and validate the underlying algorithms for these and other data-driven functionalities. While test-vehicles and simulations can deliver some of the required data, test fleets are typically very limited in size, whereas synthetic simulation data always carries the risk of limited accuracy compared to real-world occurrences. Accordingly, access to productive fleet data as well as the option to schedule specific parameter-based data collection campaigns (e.g. in case of a registered anomaly) within the vehicle operation center is a valuable tool for any data-driven development project.

INTEGRATIONS BETWEEN DEVELOPMENT AND OPERATIONAL DOMAINS CREATE GREATER OVERALL EFFICIENCY.

User-centric development planning

Development resources are typically limited, meaning that features and functionalities may need to be prioritized as part of the development planning. Without access to direct customer data, this can easily turn into a heavily politicized and poorly structured process, leading to irrational development choices that fail to meet and improve on actual customer needs. Using service usage statistics from the VOC, development goals can be categorized according to actual user preferences and needs, thereby improving efficiency and effectiveness of future development cycles.

Hybrid testing fleets

As mentioned earlier, testing fleets are limited in size, as dedicated testing activities tend to incur high costs for human- and hardware resources. In turn, this means that any testing activities done by these fleets will likely capture only part of all relevant test cases, leading to incidents and bugs in subsequent customer-facing releases. Using VOC-functionalities, upcoming releases could be introduced to hybrid testing fleets, made up of vehicles whose owners have agreed to be part of such a hybrid test plan. These tests could take the form of either a shadowing mode (the vehicle runs two systems in parallel, the existing, stable version as well as a potential updated version and logs divergences and anomalies) or an early-access type of release in the case of services which are not as safety-relevant. Hybrid testing approaches significantly boost the reach and flexibility of testing campaigns, thus increasing overall system quality.

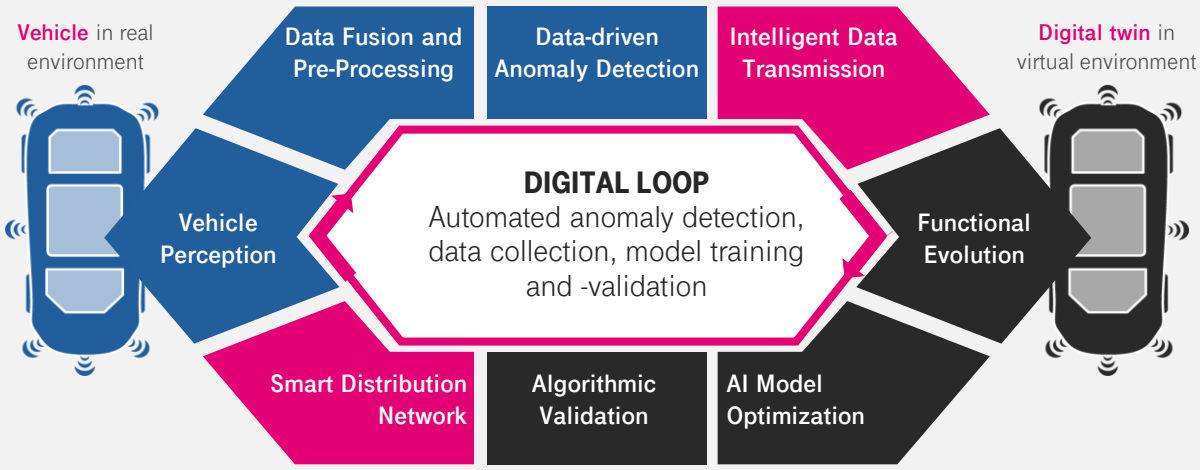
VOC for RUN teams

With their long-term responsibility for ongoing fleet and platform management, operational teams are the natural primary owners of any overarching lifecycle management system. Their access to detailed fleet data, update campaigns and device management systems provides an ideal anchoring point for other stakeholders in the development, customer experience and security domains. In particular, the VOC helps operational teams to achieve greater visibility and control over their fleets as well as underlying platform processes, engaging in a more efficient and effective management of incidents and interventions, while also providing a detailed monitoring framework to assess fleet integrity at different levels of granularity.

Visibility and control for operators

Connected vehicle operations increasingly boil down to managing digital services and applications within the vehicle's IT systems. Doing so on a global fleet level requires a scaled analytics framework to assess overall system status, update history and general service eligibility. In addition, operational teams require direct access to the systems used to remotely influence vehicle systems, such as an OTA update platform or a device management backend. The VOC provides both input data and necessary control options through read/write integrations with all relevant business processes and systems. Fleet data can be accessed on varying levels of granularity, allowing for filtering and advanced drilldown functionalities.

Integrated development and operations enable continuous data-driven improvements.



A ROBUST OPERATIONS FRAMEWORK PROVIDES THE FOUNDATION FOR POSITIVE CUSTOMER EXPERIENCE.

It also offers streamlined access to downstream workflow engines, allowing globally distributed operational teams to engage directly with worldwide fleets and individual vehicles. These visibility and control options are not only instrumental to enable new business models and customer-facing services, but also essential to enact basic compliance measures according to local regulations in different regional markets.

Proactive and reactive interventions

A wide variety of incidents can disrupt day-to-day operations of connected vehicle fleets. Outdated or low-quality onboard and offboard software may detract from user experience and could even create opportunities for malicious outside influences to take control over subsets of vehicle functionality. A VOC mitigates these risks through a consistent service provisioning approach and patch management, ensuring that improvements and relevant changes are consistently rolled out to all fleet vehicles and backend components. It also provides standardized workflows for regular quality campaigns, detecting substandard vehicle and device components across fleets and administering updates or configuration changes wherever necessary. In case of urgent or highly specific incidents, filtering and drilldown options provide the necessary flexibility to target select groups of vehicles for immediate updates and other remote management procedures.

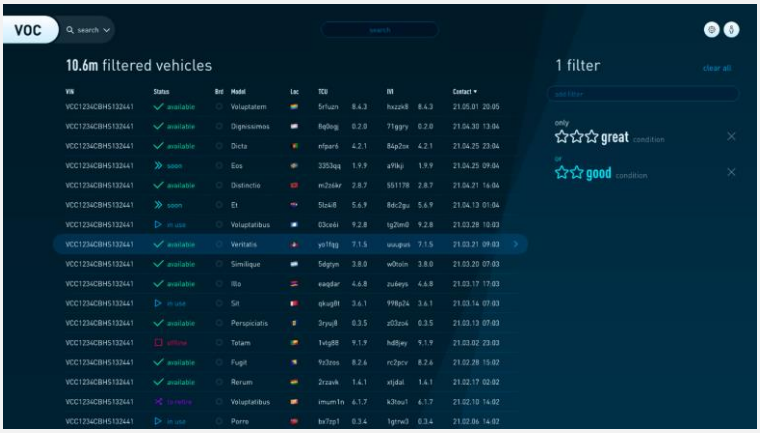
Health monitoring and reporting

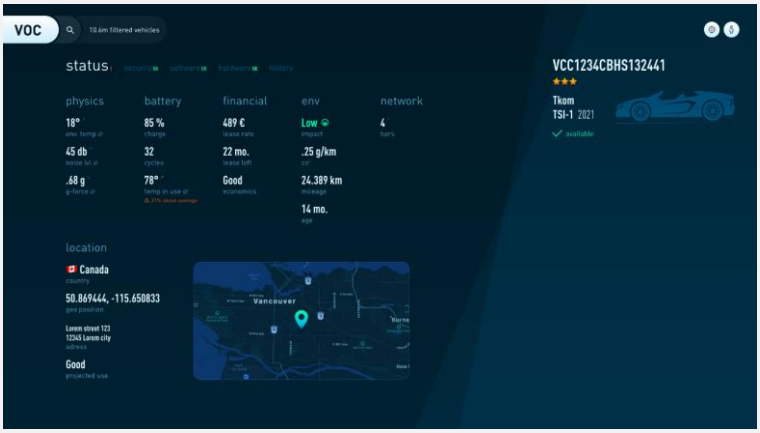
Despite significant efforts dedicated to update campaigns and other fleet management activities, not all fleet vehicles may exhibit the desired configurations and software versioning status.

This can be due to a number of factors, such as connectivity status at the time of update, faulty hardware components or hitherto undiscovered software bugs. Similarly, backend components located at the cloud and edge level may experience suboptimal functionality due to network malfunctions, configuration mistakes or limited scale of underlying virtual compute and storage resources. By consistently monitoring and tracking these edge cases against KPIs, operational experts can gain a closer understanding of overall system health, critical fleet segments and potential vulnerabilities within the end-to-end connected vehicle ecosystem. These insights can also help to identify future improvement areas for development teams and pinpoint the exact point of failure in case of urgent incident management and bugfixing needs. It is imperative to recognize that a consistent user experience has to be grounded in end-to-end operations, preventing, tracking and mitigating component failures at the vehicle, edge and cloud levels wherever feasible.

VOC for customer experience management

Customer-centricity places the customer at the core of any business considerations. While many automotive players subscribe to this general notion, explicit, ongoing customer experience management and operations have yet to gain a systematic footing throughout the organization. By associating customers with technical and operational issues and identifiers such as VINs, telematics data or vehicle and device configurations, automotive OEMs can leverage deep insight to enable an end-to-end customer experience management. Potential applications and use cases are manifold, spanning from improved aftersales services to a fully transparent digital service business.





CUSTOMER-FACING PROCESSES CAN BE FURTHER IMPROVED BASED ON INTEGRATED ANALYTICS WORKFLOWS.

Aftersales optimization

Vehicle depreciation and hardware issues are not necessarily a bad thing. For automotive OEMs, they offer a significant source of additional revenues – provided that vehicle owners choose OEM-authorized maintenance partners for regular checkups and repairs. This provides a good example of a potential handover between operational and customer domains. If operational analysis shows a certain degree of depreciation in specific fleet segments, this creates the opportunity for customer experience teams to engage the owners of those vehicles in a predictive aftersales campaign, showcasing current vehicle status and offering simplified remedies in the form of pre-scheduled maintenance appointments with authorized maintenance partners. VOC-based pre-analysis also allows for partial workflow automation in the delivery of aftersales services, thus decreasing the overall time and effort spent on individual vehicles, e.g. through a pre-analysis of relevant vehicle subsystems.

Digital service subscription campaigns

Digital Services and on-demand feature utilization are projected to become significant revenue drivers for the automotive industry. While conceptually sound, this approach depends on sufficient user awareness and interest. A continuous customer management and service marketing approach will become an absolute necessity to push customers towards trying out new services (and eventually subscribing to them). A VOC supports these high-level business processes through service activation and subscription campaigns, leveraging historic and real-time customer data to identify cross- and upselling opportunities within a given fleet. Depending on their complexity, follow-ups to these opportunities can then be handled through either automated workflows, or customized campaigns by a dedicated customer experience management team.

Customer retention

Acquiring new customers is typically significantly more expensive than retaining existing ones. The automotive industry is no exception to this, with brand loyalty playing a key role in influencing future buying decisions. With connected vehicle services, things are looking slightly different, however. Vehicle infotainment systems are engaged in an ongoing competition against smartphones and other mobile devices which come with their own set of digital services – typically very advanced ones. In such a dynamic environment, knowing when customers might decide to switch service providers can prove to be an important competitive advantage. Through its data aggregation and analysis features, the VOC allows automotive OEMs to do just that. Mapping current customer and vehicle data onto general lifecycle patterns and historic incidents of service cancellations allows customer experience teams to pinpoint critical user groups and design appropriate retention and mitigation measures, such as targeted discounts, free service trials, bugfixes or even adjustments to upcoming feature development roadmaps.

Security operations

Connected vehicles and services are heavily dependent on end-to-end security concepts. These extend throughout the full lifecycle and include issues related to development, operations and customer experience. Successful prevention measures and incident management approaches should involve all of these domains, making the VOC an ideal tool for integrated security monitoring and incident resolution. Essentially, security analysts are enabled to perform in-depth monitoring routines and analyses using operational analytics. In case of incidents, development integrations can be leveraged for rapid bugfixes, rollbacks and patch management. Throughout the process, incident managers have the option of relaying critical information to end customers using customer experience campaigns. The latter can also be used to mitigate potential impact on customer relationships, thus increasing user retention in case of critical incidents.

VEHICLE OPERATION CENTER INTEGRATES WITH EXISTING BUSINESS SYSTEMS BASED ON A MODULAR ARCHITECTURE.

These capabilities are also necessary to enact reliable security measures such as the ones outlined by recent UNECE Security guidelines. Particularly the recent R155 and R156 regulations require automotive OEMs to provide an overarching management of vehicle-related cybersecurity risks. They include measures to secure the overall vehicle development process as well as a continuous monitoring and incident response management for vehicles operated as part of OEM fleets. Connected car providers are expected to remedy software bugs and deliver new connected services via a secure, compliant update process. The concept of a Vehicle and Security Operation Center lies at the heart of this system setup.

VOC architecture

To achieve a sufficiently flexible and scalable system, any VOC deployment should follow a number of fundamental design principles. First and foremost, the VOC must not be seen as yet another data lake. Rather than replacing existing business systems, the VOC integrates them. To avoid redundant data storage, it queries relevant applications and service platforms based on current user requests. In doing so, the VOC relies on a number of connectors which feed into an overall data aggregation layer. This data aggregation layer uses a meta data model, such as a business ontology, to derive coherent information from several different data sources and formats. While defining and maintaining such an ontology still requires a certain amount of effort, this approach allows automotive OEMs to integrate their entire system landscape without the need to refactor data processing functionalities within each individual legacy system.

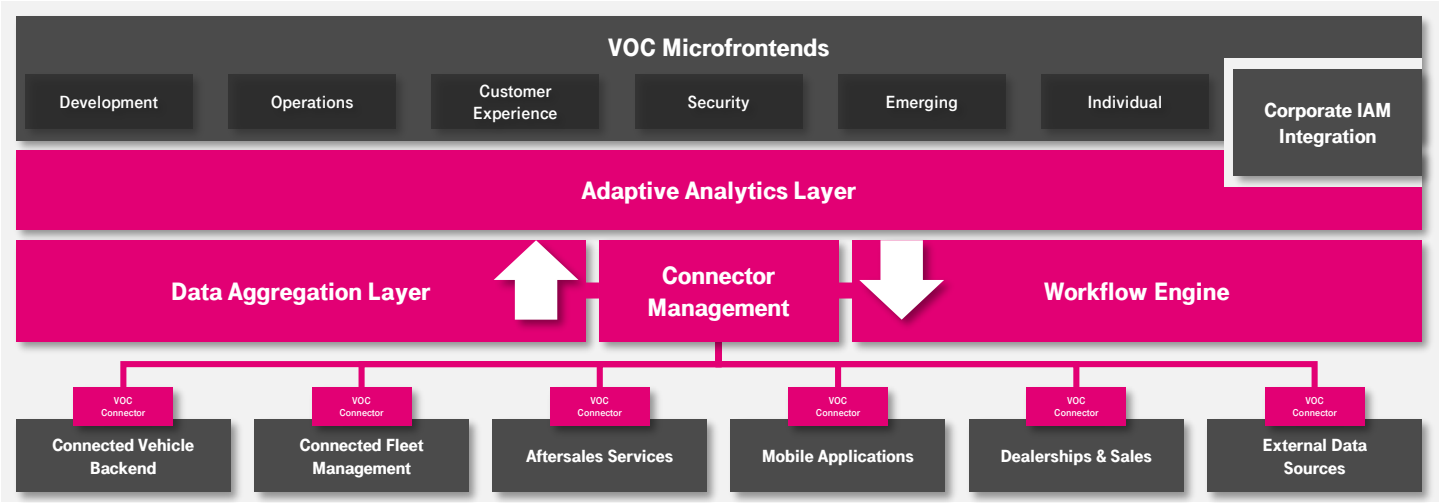
Adapative analytics to consolidate data sources

Once received, normalized and harmonized, input datasets are kept in a specific cache for further analysis by VOC users. There is no permanent storage within the VOC system: after datasets are no longer in active use, they get deleted from the cache. This prevents unnecessarily excessive use of storage and compute resources – something which could easily develop into an extremely costly mistake when considering the amounts of data produced by fleets numbering in the millions of vehicles.

Cached data can then be accessed by an adaptive analytics layer, combining rule-based systems such as client-specific runbooks and business process logic with statistical and data-driven analysis patterns. Teams are enabled to implement their individual analytics use cases by leveraging flexible dashboarding and visualization solutions.

Automated analytics and workflows

Analytics within the VOC also extend beyond exploratory analysis. Its integrated workflow engine allows development, operations and experience teams to schedule workflows spanning across relevant business systems. Integration is once again based on dedicated system connectors, providing the dual function of data aggregation and workflow handover. A workflow automation framework provides users with the option of creating fully integrated and automated workflows without the need for manual input by VOC team members.



VEHICLE OPERATION CENTER IMPLEMENTATION REQUIRES A STRUCTURED DATA GOVERNANCE APPROACH.

Implementing a VOC

Before engaging in successful VOC implementation activities, automotive OEMs need to consider a few key factors. Besides questions regarding overall system architecture – how does the VOC fit into the overarching enterprise architecture, which existing systems are integrated by it, how does it extend overall capabilities etc. – these factors relate primarily to available data sources within the system as well as relevant business processes. The necessity for data sources is rather obvious – a VOC can only analyze what is already being measured. Typically, a significant portion of relevant data categories will already be available within the overall system landscape, albeit distributed over different systems.

Building a data integration roadmap

Mapping relevant data categories onto these systems is the first step towards devising a detailed data integration roadmap. In some cases, that roadmap might include refactoring activities for legacy components so as to be able to capture certain key data sets. Similar analyses will be required for the business process view, determining a precise set of workflows and system interactions for the VOC to be involved in. The complete data and workflow integration roadmap provide the basic prerequisites for a well-structured initial deployment of VOC connectors.

In addition, providers need to consider the global footprint of their intended system architecture, particularly with regards to the distribution of data sources. Regular complexities in specific regions and countries may render local datasets inaccessible to global VOC instances, requiring workarounds or regional and country-specific deployments. Certain platform components may be provided by service partners and other 3rd parties. Integrating these systems as data sources and workflow components typically requires well-defined concepts for partner management and 3rd party access.

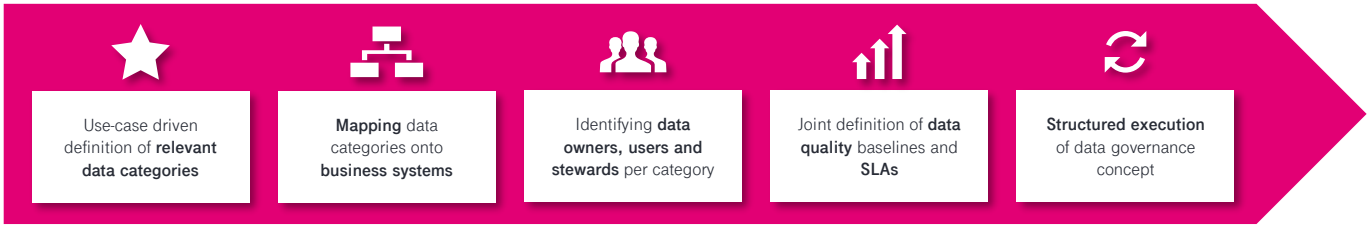
Unifying data governance across business units and partner systems

Resolving issues surrounding data ownership, accessibility and usage may be required before the VOC can start to process data from partners and other external sources. Particularly in the context of multi-partner activities, ensuring the availability of a thoroughly defined, secure Identity and Access Management (IAM) system is a key requirement for a scalable VOC implementation. Manual data access definitions are bound to lead to inconsistencies, hinder compliance and compromise integrity of data and data-driven workflows.

Generally speaking, any VOC activities should be preceded or accompanied by thorough Data Governance initiatives. While the VOC can integrate and analyze a diverse set of data sources, analytical results will always be highly dependent on underlying data quality. To ensure quality and consistency of this data, structured governance activities need to be adopted at the source level, ideally in combination with a clearly defined concept for roles and responsibilities , identifying data owners, stewards and consumers for each upstream application.

Conclusion & outlook

End-to-end lifecycle management is a key capability for any connected car player looking to grow their business in the digital service market. Existing analytics platforms tend to be either limited to specific lifecycle segments or lacking in active workflow management capabilities. Automotive OEMs need a platform that is able to deliver both analysis and execution throughout the automotive lifecycle, for different fleet segments and at variable levels of granularity. This platform needs to provide the necessary capabilities for rapid and efficient onboarding of upstream data sources, use cases and downstream business processes.



T-SYSTEMS BUILDING BLOCKS PROVIDE ROBUST SOLUTIONS FOR RAPID VEHICLE OPERATION CENTER IMPLEMENTATION.

Leveraging building blocks

The T-Systems Vehicle Operation Center Building Block fulfills all of these requirements in an effective and platform-agnostic way. Its modular design allows for rapid deployment into all available cloud technology stacks. A combination of automotive-specific and cross-industry ontology segments simplifies integration activities with relevant data sources and other platform components. Our focus on basic, OEM-agnostic functionality enables a maximum degree of customizability as well as intuitive use case and workflow design. An expressive visual language empowers all relevant stakeholders within the connected car ecosystem to utilize and leverage the VOC within their daily work, regardless of their specific expertise with databases, markup languages and scripting. Put simply, the VOC creates an overarching lifecycle management hub, offering visibility and control across all connected fleet vehicles.

By leveraging existing T-Systems Building Blocks, automotive players can create their own, fully customized Vehicle Operation Center, focusing on rapid execution and maximum reuse of existing assets and capabilities. The T-Systems Building Block portfolio is continuously evolved and developed according to automotive and industry-agnostic best practices, ensuring efficiency, security and compliance. For an in-depth discussion about your VOC use cases, including demonstrations of existing Building Block functionalities, please contact our automotive experts at T-Systems Connected Mobility .

About T-Systems

Together with clients and partners, T-Systems drives the shift towards future mobility. By offering a wide portfolio of solutions for connected and automated mobility, we enable automotive players to face challenges and harness new opportunities. Our solutions cover key topics such as connectivity, security, platform development and long-term operations – not just in the automotive sector, but cross-industry, including many future growth sectors for automotive OEMs such as mobility services, IoT and Smart Cities.

Within the connected car space T-Systems is developing, operating and transforming highly scalable global service platforms for millions of vehicles according to cross-industry standards and best practices. By enabling continuous integration and delivery according to DevOps in a scalable cloud-based microservice architecture, we empower our clients to focus on differentiation and value-creation for customers and consumers. Our experience in enabling continuous connected vehicle transformation spans over 12 years and will continue to grow in the years to come. Through independent innovation activities and our intense involvement in research projects and testbeds for connected and autonomous mobility all over the world, T-Systems ensures that clients will reap the benefits of cutting edge developments in technologies such as 5G, V2x, Edge Computing, Data-driven algorithms and anything else that will power the future connected car.

THE C3 WHITEPAPER SERIES EVALUATES KEY TOPICS FOR FUTURE CONNECTED MOBILITY PLATFORMS.

Connected Car Challenges