



APIs Fueling the Connected Car Opportunity



Introduction:

Delivering Connected Car Value Through APIs

Maximizing Customer Engagement & Backend Management

According to MarketWatch, the global connected cars market is expected to be worth \$480 billion by 2024. The convergence of the app economy, increased connectivity, the Internet of Things (IoT), growth of in-car screen displays and open enterprise data models is giving automotive manufacturers and their partners a wealth of opportunities to improve service delivery and backend supply-chain management.

The connected car offers manufacturers and dealers ways to deliver a better consumer experience post purchase and will prove strategic to developing consumer loyalty in the long term. Today's connectivity technologies empower the automotive sector to deliver increased value via a number of innovative features, including: :

- The ability to remotely start or unlock a vehicle
- Real-time diagnostic information to prevent minor issues from turning major
- Connection with insurance companies, to take advantage of “good driver” discounts
- Integration with car part suppliers in order to better manage inventory

Meeting the Integration Challenges of the Connected Car Ecosystem

The complexity of the connected car ecosystem creates a range of new development, integration and security challenges. Automotive connectivity requires manufacturers to integrate with the IT systems of a broad set of industry, service, infrastructure, regulatory and technology partners.

The application programming interface—or API—represents the connectivity point that makes this possible. The API exposes application functionality and data in developer-friendly formats, making it possible to accelerate the development of apps that connect vehicles, mobile devices and online identities.

However, exposing enterprise systems in this way creates its own security and management challenges: efficiently externalizing data and functionality via APIs; securing these interfaces against attack and hijack; providing seamless access for authorized users; optimizing the speed and reliability of transactions; onboarding and enabling app developers.



Table of Contents

Web & Mobile Marketing

Achieve Frictionless Prospecting Through Social Media - - - - - 4

Remote Auto Companion Apps

Deliver Anywhere, Anytime Driver-to-car Connectivity - - - - - 8

In-Car Infotainment Apps

Accelerate In-car App Development and Delivery - - - - - 12

Automotive Commerce

Ensure Convenient and Secure In-car Commerce - - - - - 16

Fleet Management & Maintenance

Optimize Routes, Fuel Economy and Maintenance - - - - - 20

Web & Mobile Marketing

ACHIEVE FRICTIONLESS PROSPECTING THROUGH SOCIAL MEDIA



Web & Mobile
Marketing

Remote Auto
Companion Apps

In-Car
Infotainment Apps

Automotive
Commerce

Fleet Management
& Maintenance



Why?

CONSUMERS PREFER WEB AND MOBILE INTERACTIONS

What?

CREATING DYNAMIC APPS WITH SOCIAL INTEGRATION

How?

SECURELY EXPOSE BACKEND SYSTEMS VIA APIS

Web & Mobile Marketing

Today's consumer wants to engage with car manufacturers and dealers through the consumer's preferred channel of choice, which increasingly means Web or mobile.

Consumers expect a seamless experience across channels. For enterprises, fulfilling this expectation facilitates immersive, personalized engagement with brands.

Understanding how customers behave early in the sales cycle provides vital information for future product development and marketing efforts.

“Recent insights have revealed that more than 50% of customers make their decision online, emphasizing the importance of managing the online channel.”²

² 8 Trends Shaping Digital Marketing in the Auto Industry, Mckinsey, www.mckinsey.com/client_service/marketing_and_sales/latest_thinking/eight_trends_shaping_digital_marketing_in_the_auto_industry



Why?

CONSUMERS PREFER
WEB AND MOBILE
INTERACTIONS

What?

CREATING DYNAMIC
APPS WITH SOCIAL
INTEGRATION

How?

SECURELY EXPOSE
BACKEND SYSTEMS
VIA APIS

Web & Mobile Marketing

Delivering engaging, frictionless Web and mobile experiences has become central to how companies across sectors optimize customer acquisition and retention.

Automotive companies need to develop dynamic mobile apps that market their products directly to prospects and customers in an engaging, non-intrusive manner.

To make these apps as frictionless as possible, developers must be able to integrate with social media, particularly to leverage social identities for seamless login.



1.015
217.65
51.41%

Why?

CONSUMERS PREFER
WEB AND MOBILE
INTERACTIONS

What?

CREATING DYNAMIC
APPS WITH SOCIAL
INTEGRATION

How?

SECURELY EXPOSE
BACKEND SYSTEMS
VIA APIS

Web & Mobile Marketing

Using an API Gateway to securely expose valuable backend information assets as APIs speeds the creation of apps that offer real value to prospects and customers.

An API Management solution that enables unified access across Web and mobile will ensure consumers maintain a personalized experience over their channels of choice.

A solution that allows integration with social identities from popular networks such as Facebook and LinkedIn will maintain convenient access across both channels.

Remote Auto Companion Apps

DELIVER ANYWHERE, ANYTIME DRIVER-TO-CAR CONNECTIVITY



Web & Mobile
Marketing

Remote Auto
Companion Apps

In-Car
Infotainment Apps

Automotive
Commerce

Fleet Management
& Maintenance



Why?

EXTEND IN-CAR
FUNCTIONALITY TO
MOBILE DEVICES

What?

ALLOWING REMOTE
ACCESS TO CARS VIA
MOBILE APPS

How?

ENABLE APP
DEVELOPERS AND
ENSURE SECURE
ACCESS

Remote Auto Companion Apps

After buying a car, today's connected consumer expects a more positive ongoing experience with its manufacturer.

The app economy, combined with improved mobile bandwidth and IoT technology, is providing powerful new opportunities for car manufactures to offer premium post-sale services.

Mobile apps make it possible to simultaneously simplify and extend interactions with products, creating an optimal post-sale experience.

Learn More: [EBook: 5 OAuth Essentials for API Access Control](#) Create a framework for implementing OAuth-based access control

“GM owners request remote door unlock assistance... more than 60,000 times each month, so it makes sense for us to... enable customers to lock, unlock or start their vehicle from anywhere.”³

³ GM to Make Door Unlock, Remote Start Standard, GM, www.media.gm.com/media/us/en/gm/news.detail.html/content/Pages/news/us/en/2013/Jun/0605-remote-link-app.html



Why?

EXTEND IN-CAR
FUNCTIONALITY TO
MOBILE DEVICES

What?

ALLOWING REMOTE
ACCESS TO CARS VIA
MOBILE APPS

How?

ENABLE APP
DEVELOPERS AND
ENSURE SECURE
ACCESS

Remote Auto Companion Apps

It is now possible to create mobile apps that allow the driver to connect remotely with their car in order to access data and control functionality anytime, from anywhere.

To take advantage of this opportunity, a manufacturer must be able to internally create apps that truly differentiate the post-sale service it offers.

These apps should deliver premium capabilities like remote lock/unlock/start and diagnostics while maintaining the security of the vehicle without impacting usability.

Learn More: [EBook: 5 OAuth Essentials for API Access Control](#) Create a framework for implementing OAuth-based access control

Remote Auto Companion Apps

Deploying an online API Portal through which developers can register for, learn about and leverage APIs will speed app development and maximize app quality.

Manufacturers should also look for an API security solution that includes SDKs which make it possible to build end-user authentication directly into the mobile app itself.

This solution must use key standards like OAuth so that apps can provide convenient, secure access via Single Sign-On, step-up authentication and fine-grained access control.

Learn More: EBook: 5 OAuth Essentials for API Access Control Create a framework for implementing OAuth-based access control

Why?

EXTEND IN-CAR
FUNCTIONALITY TO
MOBILE DEVICES

What?

ALLOWING REMOTE
ACCESS TO CARS VIA
MOBILE APPS

How?

ENABLE APP
DEVELOPERS AND
ENSURE SECURE
ACCESS

In-car Infotainment Apps

ACCELERATE IN-CAR APP DEVELOPMENT AND DELIVERY



Web & Mobile
Marketing

Remote Auto
Companion Apps

In-Car
Infotainment Apps

Automotive
Commerce

Fleet Management
& Maintenance



Why?

CONSUMERS ARE
ACCUSTOMED TO
CONNECTIVITY

What?

BUILDING AN
ECOSYSTEM OF
DYNAMIC IN-CAR APPS

How?

ENABLE AND MANAGE
THIRD-PARTY
DEVELOPERS

In-car Infotainment Apps

Today's connected car app economy is at the stage the mainstream app economy was at a few years ago—it is on the brink of causing major market disruption.

Manufacturers should also look for an API security solution that includes SDKs which make it possible to build end-user authentication directly into the mobile app itself.

This solution must use key standards like OAuth so that apps can provide convenient, secure access via Single Sign-On, step-up authentication and fine-grained access control.

Statista estimates that the North American gaming market will amount to 80.9 billion U.S. dollars annually in 2025, up from 56.8 billion U.S. dollars in 2021⁴

⁴ Games & Infotainment Apps Market Worth \$65bn by 2016, ITP.net.
<https://www.marketsandmarkets.com/Market-Reports/usage-based-insurance-market-154621760.html>



Why?

CONSUMERS ARE
ACCUSTOMED TO
CONNECTIVITY

What?

BUILDING AN
ECOSYSTEM OF
DYNAMIC IN-CAR APPS

How?

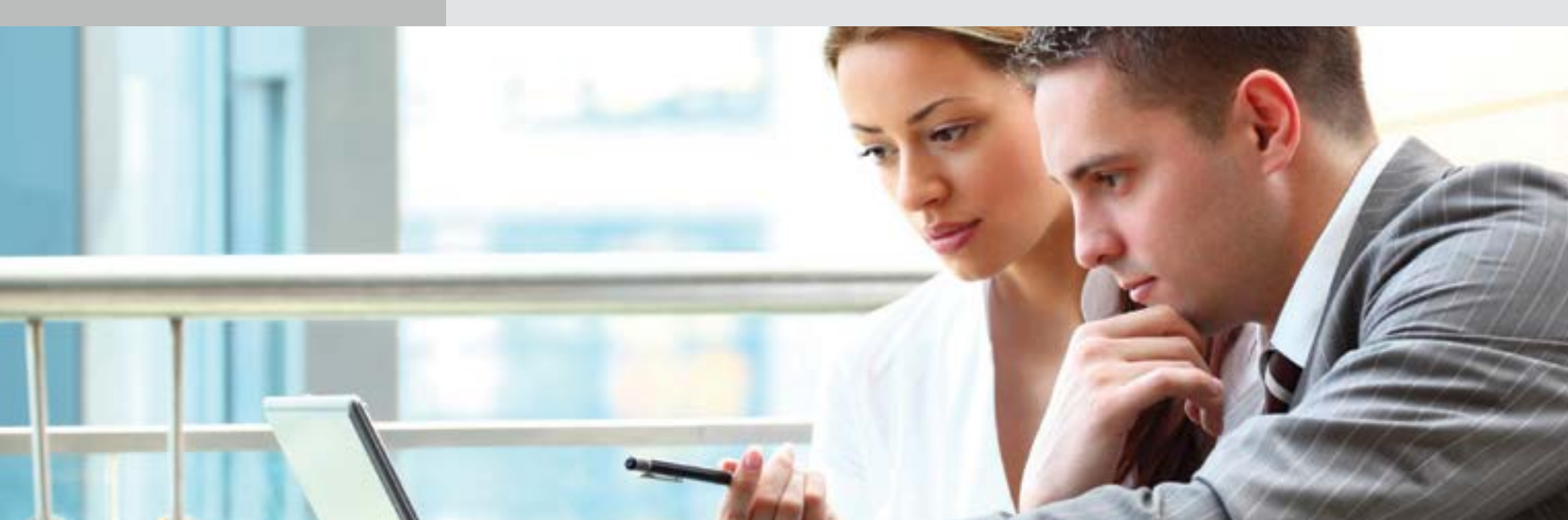
ENABLE AND MANAGE
THIRD-PARTY
DEVELOPERS

In-car Infotainment Apps

A manufacturer must be able to deliver in-car apps that differentiate its offerings from the competition.

To maximize innovation and minimize time-to-market the manufacturer should offer external developers the tools they need in order to develop apps that run directly within the vehicle's infotainment system.

These apps should provide the driver with in-car connectivity to key data and functionality, including navigation, entertainment and diagnostics.



Why?

CONSUMERS ARE ACCUSTOMED TO CONNECTIVITY

What?

BUILDING AN ECOSYSTEM OF DYNAMIC IN-CAR APPS

How?

ENABLE AND MANAGE THIRD-PARTY DEVELOPERS

In-car Infotainment Apps

A solid API security and management solution will be needed in order to open backend functionality to external developers without impacting security or performance.

To ensure third-party apps function smoothly, it is vital to manage separate API and developer lifecycles, enabling a variety of apps to connect with different API versions.

An API Portal will prove particularly crucial to effectively building, enabling and managing an active ecosystem of third-party developers.

Automotive Commerce

ENSURE CONVENIENT AND SECURE IN-CAR COMMERCE



Web & Mobile
Marketing

Remote Auto
Companion Apps

In-Car
Infotainment Apps

Automotive
Commerce

Fleet Management
& Maintenance



Why?

CONSUMERS WANT
TO MAKE PURCHASES
FROM THE CAR

What?

INTEGRATING WITH
PARTNERS TO CREATE
ECOMMERCE APPS

How?

MEDIATE DATA
INTERACTIONS TO
ENSURE RELIABLE
SERVICES

Automotive Commerce

The connected car creates the opportunity to deliver wireless connectivity, usage-based insurance and other services, like product advertising, directly to the vehicle.

As customers become accustomed to in-car connectivity, they will start demanding the ability to access and purchase products and services directly from the vehicle.

Manufacturers have much to gain from partnering with insurance providers and advertisers that want to deliver offers and ecommerce interfaces straight to the car.

Learn More: EBook: 5 Simple Strategies for Securing APIs Adopt a secure API architecture to counter API-specific threats

“Nearly 90% of survey participants were open to buying a UBI [usage-based insurance] policy in the US if there is no risk of premiums increasing.”⁵

⁵ Usage-Based Insurance: US Consumer Survey, Towers Watson
www.towerswatson.com/en/Insights/Newsletters/Americas/americas-insights/2013/Usage-Based-Insurance-Consumer-Survey



Why?

CONSUMERS WANT
TO MAKE PURCHASES
FROM THE CAR

What?

INTEGRATING WITH
PARTNERS TO CREATE
ECOMMERCE APPS

How?

MEDIATE DATA
INTERACTIONS TO
ENSURE RELIABLE
SERVICES

Automotive Commerce

In-car ecommerce apps can be created that enable consumers to purchase 4G, UBI policies and retail products directly from the car.

These apps must offer secure data integration between all parties, protect sensitive consumer data and meet key standards (e.g. PCI-DSS) and regulatory requirements.

The apps should also provide valuable consumer data to insurance companies and retail partners, while protecting user privacy.

Learn More: EBook: 5 Simple Strategies for Securing APIs Adopt a secure API architecture to counter API-specific threats



Why?

CONSUMERS WANT
TO MAKE PURCHASES
FROM THE CAR

What?

INTEGRATING WITH
PARTNERS TO CREATE
ECOMMERCE APPS

How?

MEDIATE DATA
INTERACTIONS TO
ENSURE RELIABLE
SERVICES

Automotive Commerce

An API Gateway should enable the creation of a “data lens”, securely externalizing key driver data (e.g. payments, driver profile, car location) to the manufacturer.

A full-functioned Gateway will make it possible to integrate and mediate transactions between the car, enterprise and partner to provide secure, reliable services.

Again, an API Portal will be an important part of the overall solution, making it simple to enable internal and third-party developers to leverage these secure integrations.

Learn More: EBook: 5 Simple Strategies for Securing APIs Adopt a secure API architecture to counter API-specific threats

Fleet Management & Maintenance

OPTIMIZE ROUTES, FUEL ECONOMY AND MAINTENANCE



Web & Mobile
Marketing

Remote Auto
Companion Apps

In-Car
Infotainment Apps

Automotive
Commerce

Fleet Management
& Maintenance



Why?

OPTIMIZE THE
EFFICIENCY OF
LOGISTICS OPERATIONS

What?

RECORDING AND
SHARING VEHICLE
AND ROUTE DATA

How?

COORDINATE DATA
SHARING THROUGHOUT
THE VALUE CHAIN

Fleet Management & Maintenance

There is a growing demand across the transportation, government, retail and utility sectors for improved logistics and fleet management systems.

The convergence of apps, connectivity, IoT and APIs is creating an opportunity to improve services and better manage costs for the enterprise and consumer alike.

By optimizing logistics in this way, enterprises can provide better customer service and maximize the cost-effectiveness of essential operations.

Learn More: White Paper: **Choosing the Right API Management Solution** Address key characteristics of an effective API Management solution

Markets & Markets recently reported that the fleet management market is likely to be worth \$31.5 billion by 2023.⁶

⁶ Fleet Management Market Global Forecast to 2023 https://www.marketsandmarkets.com/Market-Reports/fleet-management-systems-market-1020.html?gclid=EAlalQobChMIzaDE4pWt4wlVFdVkJChixYgXuEAAYASAAEgKhWPD_BwE



Why?

OPTIMIZE THE
EFFICIENCY OF
LOGISTICS OPERATIONS

What?

RECORDING AND
SHARING VEHICLE
AND ROUTE DATA

How?

COORDINATE DATA
SHARING THROUGHOUT
THE VALUE CHAIN

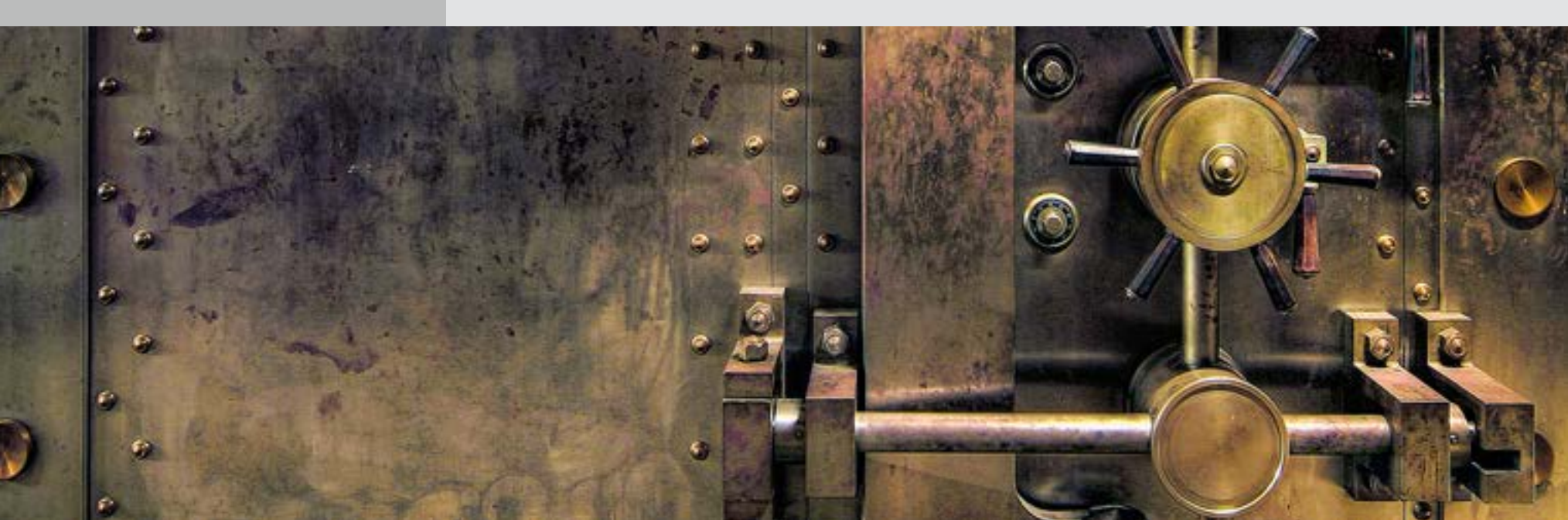
Fleet Management & Maintenance

The connected car can help enterprises and consumers optimize routes, track fuel economy, log mileage and record trip times.

Smart manufacturers will take this opportunity to coordinate data sharing throughout the value chain: traffic management systems, part suppliers, fuel partners etc.

To do this without risking data compromise will require secure connectivity between the fleet, car telematics systems, backend data repositories and partner systems.

Learn More: White Paper: [Choosing the Right API Management Solution](#) Address key characteristics of an effective API Management solution



Why?

OPTIMIZE THE
EFFICIENCY OF
LOGISTICS OPERATIONS

What?

RECORDING AND
SHARING VEHICLE
AND ROUTE DATA

How?

COORDINATE DATA
SHARING THROUGHOUT
THE VALUE CHAIN

Fleet Management & Maintenance

A Gateway-based API Management solution will simplify the process of externalizing functionality for fleet tracking, traffic management, inventory and auto supply.

The Gateway will also provide the features needed to secure exposed APIs against external threats and unauthorized access.

In this use case, the API Portal will be used to accelerate the creation of effective administrative fleet tracking companion apps.

Learn More: White Paper: [Choosing the Right API Management Solution](#) Address key characteristics of an effective API Management solution



Conclusion:

API Management for the Connected Car

In light of the app economy's disruptive impact, the connected car has become a top-agenda item across the automotive industry. In this evolving digital economy, enterprises must be able to adapt and execute upon opportunities created by emerging technologies or risk losing business to more agile competitors.

The connected car presents manufacturers with new opportunities to differentiate, strengthen relationships, build customer loyalty and deliver value throughout the entire automotive value chain. These companies must appropriately prioritize business goals, appoint digital leadership, acquire the necessary skill sets and choose the right digital platform.

The right digital platform will: accelerate time to market; support the development and version control of apps and services; deliver an optimized user experience inside and outside the vehicle. It will do all this while making safety the number one priority through proper security controls. The API has emerged as the key component of this digital platform.

In order to realize the full value of APIs and avoid the safety and privacy pitfalls of exposing

backend systems, it is vital to invest in an API Management solution that delivers the full range of functionality for service composition, security, identity and access, performance optimization, lifecycle management and developer engagement.

Layer7 API Management provides all the components required for effective, full lifecycle API management, including an API Gateway designed to simplify all key API security and management processes, an API Portal that enables effective developer onboarding and management, SDKs to securely enable mobile apps, and complete API testing and monitoring for proactive application management.

Additionally, Layer7 API Management offers:

- A choice of on-premise, cloud or hybrid deployments
- Military-grade data and application security
- API usage and performance analytics
- Application adaptation and interface management with advanced connectivity

Learn More: [Datasheet: Layer7 Full Lifecycle API Management](#)
Make API-based information sharing safe, reliable and cost-effective

Layer7 API Management
provides enterprises with
a comprehensive set of

solutions

that externalize APIs in
a secure, reliable and
manageable way.

PLEASE VISIT [THE LAYER7 PRODUCT PAGE AT BROADCOM.COM](#)

