

APPLIED AI

Driving change forward in the

Automotive industry

Globant 




The automotive

industry is synonymous with change, transformation, and innovation, a part of people's culture and lifestyles.

Ford, an American automotive legend, is a clear example of how a brand brought new ideas and cutting-edge technology to stay at the forefront of the industry.

Pioneering innovations have marked Ford's journey of evolution. The introduction of the assembly line by Henry Ford in the early 20th century revolutionized manufacturing, making cars


affordable for millions. The groundbreaking creation of the Model T enabled the company to reduce costs and waste, thus offering competitive salaries and reduced work hours. It was the beginning of the American middle class.



The evolution of Ford keeps going forward, *as in recent years,*

it has fully embraced AI in its operations. AI-driven automation has optimized production lines, resulting in greater precision and efficiency.

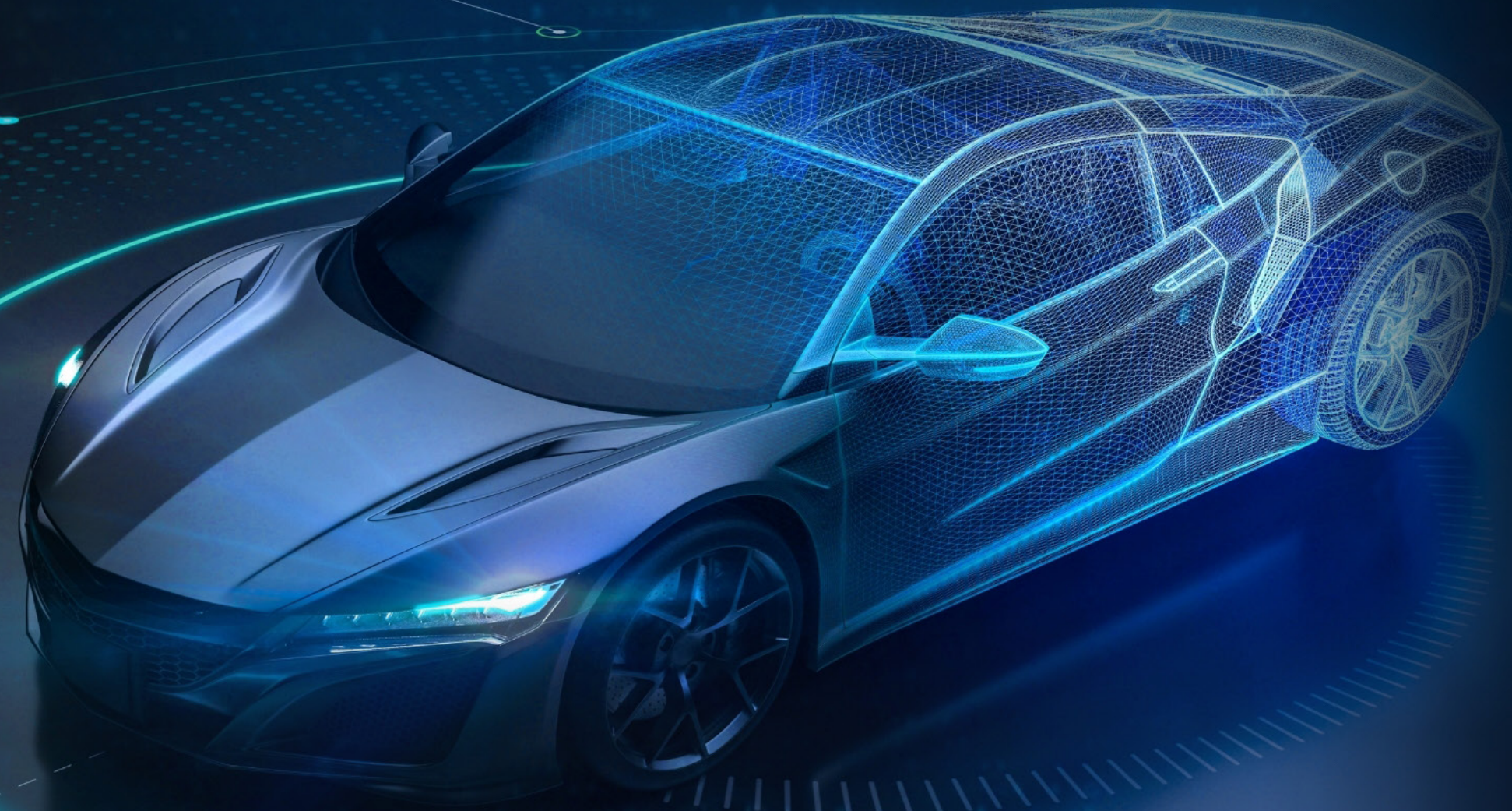
AI plays a pivotal role in Ford's journey towards autonomous driving. Ford's latest movement towards AI is the creation of Latitude AI, a subsidiary focused on developing autonomous vehicles. With expert teams in machine learning, robotics, software, sensors systems engineering, and test operations, Latitude AI aims to "help improve safety while unlocking all-new customer experiences that reduce stress and in the future will help free up a driver's time to focus on what they choose."



As artificial intelligence is permeating every corner of our world,

the question for the automotive sector is, how will this technology impact the growth and innovation of the industry, as well as our driving experience?

The automotive industry is growing *fast and furious*



AI is taking growth to the next level, as today, we are driving through an era where artificial intelligence has the power to reshape the automotive landscape like never before. The global automotive artificial intelligence market anticipates robust growth at a compound annual growth rate (CAGR) of 29.2%. It is expected to attain a valuation surpassing **USD 34.40 billion during the projected period spanning from 2022 to 2030.**

Some factors influencing

the growth of the global automotive artificial intelligence market are research and development, advanced technologies, customer demand, government initiatives, and cost challenges. AI has also been seamlessly integrated into the various facets of the automotive value chain.

This includes manufacturing, design, supply chain management, production, post-production, and implementing “driving assistance” and “driver risk assessment” systems.

The autonomous vehicle market is expected to grow above a CAGR of

25.75% and reach over USD 197 billion by 2030.



Within automotive manufacturing, services like part production and design increasingly collaborate with human workers to enhance *the output of AI-driven vehicles.*

AI utilizes human data and algorithms to replicate human decision-making and cognitive capabilities. This incorporation of AI empowers automobile manufacturers to streamline their decision-making processes, ultimately ensuring a superior customer experience. In contemporary vehicles, AI tools and systems are already in use, exemplified by features like anti-lock braking systems (ABS) and adaptive cruise control.

Going fast and far together:

Collaborative innovations & strategic acquisitions



As AI is becoming a priority for major players, they seek to integrate it directly into their strategic roadmap, resulting in the global acceleration of AI startups, collaborations, partnerships, and acquisitions already happening and increasing.



Some examples:

1 Hyundai Motor Group

with a strategic investment venture with Tenstorrent that integrates AI technology seamlessly into forthcoming Hyundai, Kia, and Genesis vehicles and other future mobility solutions. The investment totaling \$50 million, contributed jointly by Hyundai Motor and Kia, is intended to accelerate Tenstorrent's efforts in designing and developing AI chiplets and enhancing its machine-learning software roadmap.

Hyundai Motor Group has invested approximately **US\$1 billion into 200 startups** worldwide since 2017, like Grab in Singapore and OLA in India. These investments primarily focus on mobility services, electrification of powertrains, zero emissions, connectivity, artificial intelligence (AI), and autonomous driving.

2 Stellantis acquired aiMotive

a prominent developer of advanced artificial intelligence and autonomous driving software. This acquisition will bolster Stellantis' core technology in artificial intelligence and autonomous driving, augment its global talent pool, and accelerate the mid-term development of the STLA AutoDrive platform.

3 Volvo acquired Zenseact

an autonomous driving software and hardware supplier. This move aims to strengthen Volvo's control over the software powering future cars and aligns with its strategic goal of becoming a new technology leader.

4 Tesla has acquired DeepScale

a four-year-old AI startup, as part of its efforts to advance the development of autonomous vehicles. The deal could aid Tesla in producing vehicles with advanced driver-assistance systems, enabling owners to rent them out on a driverless "robotaxi" platform similar to Uber. DeepScale's tech enables automakers to use energy-efficient processors for precise computer vision, working with sensors and control systems to enhance cars' environmental perception.



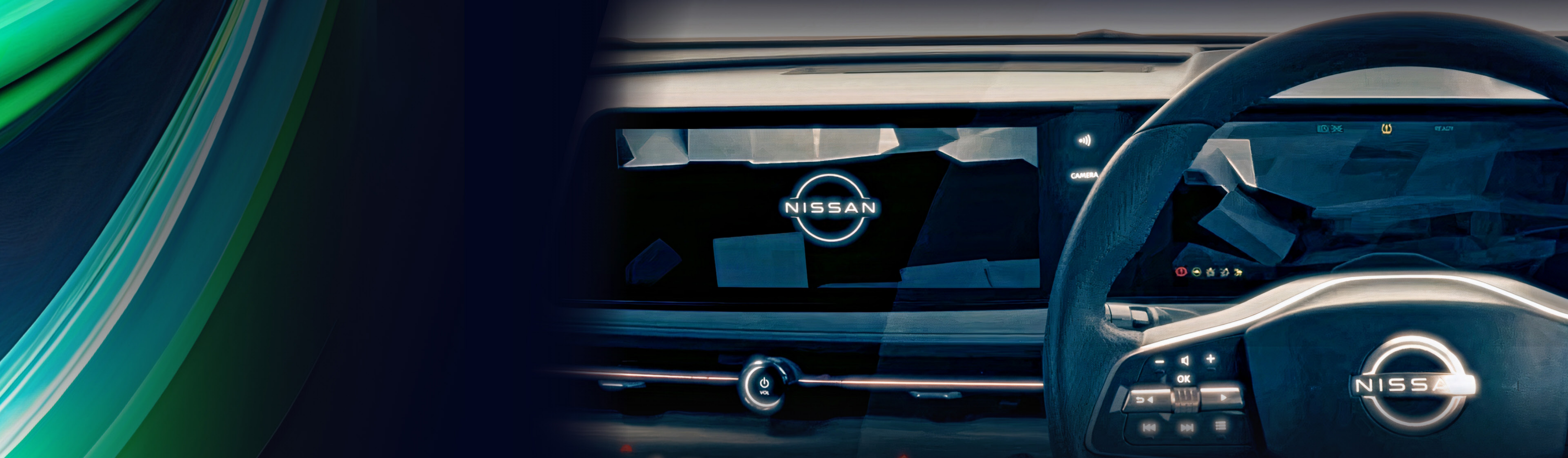
5 US electric vehicle startup Rivian Automotive

an electric vehicle startup acquired Swedish mapping company Iternio, known for the 'A Better Routeplanner' (ABRP) app, which aids EV trip planning. The acquisition will allow Rivian to enhance its trip planning capabilities, integrating ABRP technology into its in-vehicle navigation system and mobile app. This move is crucial for Rivian as it seeks to address the concerns of new EV drivers regarding battery range and charging network availability.

6 BMW employs AI-driven robots

in the construction of personalized vehicles and for the autonomous transportation of materials, adeptly navigating around obstacles and individuals. These tools, leveraging neural networks, which belong to the realm of AI technology, consistently refine their understanding of their surroundings, thus enabling them to adjust to unforeseen obstacles and difficulties swiftly. Additionally, AI is pivotal in averting expensive equipment failures that disrupt production, impacting their manufacturing line. AI can forecast when machinery will necessitate maintenance by analyzing data encompassing background noise, vibrations, and other indicators.





Nissan & Globant: AI-powered chatbot

In collaboration with Nissan, Globant's Automotive Reinvention Studio wanted to transform the digital customer experience and explore innovative business approaches through data-driven decision-making and AI technology. In line with the future outlook outlined in "Nissan 2030," Globant created an AI-powered chatbot partnering with Google, Globant, and Nissan Canada (NCI), resulting in a new conversational experience.

The primary objective of the conversational AI chatbot was to enhance customer interaction and minimize wait times. NCI and Globant

collaborated on a swift six-week prototyping project, automating customer support for vehicle recalls in both English and French. Additionally, they incorporated a comprehensive analytics module for monitoring solution costs and performance. Impressively, within just five months of its launch, the chatbot engaged in over 113,000 successful conversations, demonstrating highly efficient performance metrics.

The dream team is an AI-infused team

Automotive companies are investing in recruiting and training top-tier AI talent to fortify their research and development initiatives. Silicon Valley's tech hub is where the automotive giant Tesla sets up a large office to recruit AI talent. To accelerate the development of autonomous driving and AI technologies, the company posted more than **700 positions in Palo Alto. Of these, 55% are technology and IT jobs**, including autonomous driving and robotics.

Mercedes-Benz doesn't fall behind in building an expert and cutting-edge team. The company invested **more than €2 billion in Turn2Learn,** its qualification initiative. It provides employees with more than 40,000 courses on data and AI, including neural networks, RPA, and natural language processing.

Mercedes-Benz also counts on the D.SHIFT program, which aims to train employees from production in data and AI. The program has been top-rated among the production staff, with several hundred moving to AI-related positions.

Taking AI for a test drive: *Use cases*

Various aspects of the automotive industry are being transformed by AI, from vehicle design to manufacturing, operation, and customer experience. However, three main areas are feeling the impact the most.

1 The manufacturing process

This aspect of the industry involves everything from the conceptualization, design, supply chain, and production of vehicles.

Building a vehicle is a logistical challenge. A single car needs several parts from different sources, which requires synchronizing several parties. Car manufacturing can range between \$35,000 and \$135,000 depending on materials, packaging, research and development, etc.

In an ecosystem composed of multiple factors, **AI can drastically improve the supply chain for the automotive industry and bring several benefits such as:**

- Increase data visibility, allowing manufacturers to track the shipping process in real time. This increases communication among parties and can prepare them to respond to changes or delays.
- Provide information on the array of shipping methods, enabling manufacturers to choose the one that fits their needs.
- Improve the logistics process to make inventories easier.
- Analyze weather patterns and driver performance to predict the best shipping route.
- Accelerate supply chain, production, and post-production with automation and intelligent robots.
- The equipment and machinery to build cars make it possible to integrate intuitive technology devices with the human body, adapting to human needs—for example, AI-powered wearable exoskeletons for designers to develop better safety and comfort in cars.
- Speed up time-to-market with vehicle data in predictive modeling to regulate production according to real-time demand.



2 Level-up in-car experience

The car experience is rich and complex. It involves safety, digital assistance, in-car entertainment, autonomous driving, and monitoring.

Every day, around **3,700 people die globally in crashes**. AI enables safer driving with an emerging concept: self-driving cars. Some brands already use this method, where the vehicle's sensors obtain information and make driving decisions or have a digital assistant inside the car to help in case of accidents.

Likewise, automotive companies are introducing ChatGPT to provide a better and more efficient driver experience. ChatGPT-like systems, like Bard, Claude, or custom models, can provide hyper-personalized in-car experiences, help drivers access manuals, search for information in routing applications, provide traffic updates in real-time, etc., all while responding to a natural language input.





Martin Espina

Delivery Manager
at Globant

“Gone are the days of routine commutes; AI enables vehicles to evolve into intuitive companions. Drivers are no longer passive travelers but **captains of an intelligent fleet.**”



The industry's new drive: *Use cases*

Microsoft and Mercedes-Benz are improving the automotive supply chain. Mercedes Benz's MO360 system connects 30 passenger car plants worldwide to Microsoft Cloud.

The system streamlines the supply chain ecosystem using AI, digital twins, and data analytics, providing real-time digital feedback on assembly, production planning, shop floor logistics, and quality management.

NVIDIA's AI technology, for example, can streamline the production process with Instant NeRF (Neural Radiance Fields). This neural model can create a realistic 3D scene by rendering 2D images in seconds, a technology that could allow detailed and exhaustive visualization of all vehicle components, including safety features, assistance, and materials, enabling companies to achieve higher quality, speed, and cost-efficiency in manufacturing.



Toyota uses generative AI to disrupt the design process.

The Toyota Research Institute developed a new technique based on generative AI to create more effective designs. Designers can use AI algorithms to analyze data and develop solutions to align their work with technical requirements. For instance, parameters like aerodynamic drag, chassis dimension, and performance metrics are integrated into the generative AI process. As a result, designers can unleash their creativity while meeting aesthetic and technical requirements.

In addition, manufacturers are leveraging AI to create compelling designs up to their internal features. With predictive models, AI can produce designs that might be more aesthetically appealing to consumers. Product aesthetics are related to **roughly 60% of purchasing decisions** in the automotive industry.

However, it is not about replacing designers with AI but about empowering their work, where design teams can start from concepts such as “sleek” or “modern” and iterate on them.

Automotive companies

Leveraging AI and *ChatGPT*



- **Ford** launched a chatbot, Ford Lucy, that can communicate with drivers through their cars' infotainment systems, offering real-time support.
- **Toyota** has a chatbot called Toyota Intelligent Chatbot to interact with customers.
- **Mercedes-Benz** is already using its chatbot named Ask Mercedes.
- **Nauto** has an intelligent driver system that studies driver behavior and reduces distracted driving that may cause accidents.
- **GM plans to use ChatGPT and AI** at customer service centers. An AI-powered chatbot will interact with customers, enhancing service with a more personalized and interactive experience.

However, the automotive experience starts when the user considers buying a car. That's why brands like Toyota create innovative experiences to connect with users. To promote the Toyota Mirai model, the company partnered with IBM and Tool to create the campaign "**Thousands ways to say yes.**" Toyota's model is a "scientific" car, so they trained Watson to develop AI-crafted ads to call the attention of science and tech enthusiasts.



Alvaro Pujals

Business Hacking
Partner at Globant.

"AI will transform the purchase model, allowing people to rent on a per-use basis system. The concept of car ownership might switch to using vehicles on demand. With connected infotainment systems, cars will know customers' preferences and schedules, allowing for a hyper-personalized experience."



3

Vehicle maintenance

Just like production methods, the tools for vehicle condition analysis are evolving. Many cars are now equipped with cameras and sensors that provide a wealth of data that allow a shift from corrective to predictive maintenance.

AI-powered systems can observe the performance of vehicles and identify any irregularities or possible problems. By analyzing data collected from diverse sensors and systems, AI algorithms and machine learning can offer proactive maintenance suggestions, identify malfunctions in components, and enhance the vehicle's overall efficiency, even remotely.

As a result, AI presents a quality control for systems that detect if a car component is defective before assembly and aids in preventing breakdowns, minimizing periods of inactivity, and enhancing the vehicle's overall dependability.





Alvaro Pujals

Business Hacking
Partner at Globant.

“In the future, all cars will be connected, and they will be upgraded like our phones are upgraded.”

Within those updates, there should be more opportunities or benefits for companies to offer a unique service for the user and start a new relationship with the user that is not based on going to the dealership once a year to get their car service.”

Are companies ready to implement and leverage AI?

According to Pujals, companies will face challenges that will be primarily cultural, as all processes and user touch points will change. One of the major transformations will be in the relationship between the user and the brands.

“How to generate a new relationship with the user when visiting the brand at the dealership is no longer necessary? There will be a major change in how users relate to the brand; it is not only a technological change but also a cultural, methodological, and procedural one. This new mindset will greatly impact companies and how they relate to users, as they must look for new spaces to conquer them.”

-Alvaro Pujals, Business Hacking Partner at Globant.

Alvaro adds that the dynamic shift will become more about brands seeking the user instead of the user visiting the brand at the dealership, as they will no longer need to fulfill an annual service cycle, which could even be delayed five years as the cars won't require maintenance checkups that often. Hence, brands and dealerships will, in turn, need to seek the user by offering a unique service for a particular user's needs, offering unique benefits, and exploring creative, innovative ways to engage with them.

Martin Espina, Delivery Manager at Globant, mentions different tendencies in the automotive sector across the globe:



Martin Espina

Delivery Manager at
Globant

“In the US, leaders in the automotive sector are focusing on manufacturing, infotainment, engineering design, and development, leading to a time-to-market reduction. On its part, in Latin America, the focus is on improving both the dealers and customer experience.”



The future of regulation, smart cities, and smart consumption

The marriage between the automotive industry and AI goes beyond user-vehicle interaction, with the potential to impact the planning and design of future cities. One of the primary considerations when designing an urban space is mobility: streets and roads that facilitate the movement of citizens.

What would happen if AI allowed cars to drive autonomously?

Alvaro mentions that we may no longer need garages or spaces to park a vehicle in the future, as the car can take us to our destination and then be available for someone else to use. This will change the concept of ownership, giving way to a “rental” model where a vehicle is always available for transportation but does not require ownership.

The paradigm shift in car ownership can radically change the design of cities. If cars could be rented 24/7, there would no longer be the need to design parking spaces in residential and commercial spaces: cinemas, stores, markets, etc.

AI could also use the user’s information and driving patterns to save costs and influence smart consumption. For instance, paying insurance only for the hours and time of use is possible. To provide this option, insurance and automotive companies must work together to analyze and collect customers’ usage patterns. This information can be integrated into the AI. Similarly, if the car understands how each user drives, it can help consume less fuel.

Globant's role in transforming the automotive sector through AI

For Globant, some of its goals are reinvention in the automotive industry and the future of mobility.

Globant's Automotive Reinvention Studio drives the automotive industry forward by helping clients embrace progressive solutions and capitalize on the latest technological advancements, reaching a new proven operational agility and speed ability.

As a reliable collaborator, we focus on uniting mobility and scale, guiding our clients to leverage software digital platforms, cloud, and AI. Our vision is to provide new business models and apply cutting-edge technology to help brands enhance customer experiences and reinvent the automotive industry.



Marina Saint Lary

Managing Director of Globant's
Automotive Reinvention Studio.

“Artificial intelligence is not only revolutionizing the automotive sector; it is rewriting the rules of mobility, manufacturing, and driving.”

As algorithms empower vehicles to perceive, learn, and adapt, we are driving through the transformation of a whole industry as we enter a new age of immersive experiences, seamless connectivity, and unparalleled safety.”

Globant's role in supporting automotive organizations through AI is present in:

- **Connected Mobility:** By unleashing the power of data and personalized services, our expertise empowers businesses to harness the potential of data-driven insights. Implementing advanced AI and machine learning technologies aids in optimizing supply chains, streamlining production processes, and enabling efficient tracking and tracing.
- **Mobile Customer Engagement:** As we create engaging digital experiences for automotive brands through our mobile customer engagement solutions, we craft immersive digital experiences that captivate your customers, ensuring meaningful brand interactions. Our Software-Defined Vehicle approach enables seamless connectivity and enhances user experiences.
- **Software Architecture for New Mobility Solutions:** Our software architecture expertise helps acquire comprehensive solutions to access, understand, utilize, and update the services necessary for new and demanded mobility solutions. Our focus on software architecture ensures scalability, flexibility, and agility in all operations.
- **The Future of Mobility:** To unlock new revenue streams, we dive into gaming platforms, NFT design, product showcases, virtual venues and events, and virtual immersive training, exploring new growth opportunities.
- **Vehicle Infotainment:** To enhance the in-car experience for customers with our vehicle infotainment solutions, we create tailored experiences that boost entertainment, education, and connectivity within vehicles, transforming every journey into an engaging ride.

About Globant

We are a digitally native company that helps organizations organizations reinvent themselves and unleash their potential. We are the place where innovation, design, and engineering meet at scale.

- We are more than 27,000 Globers present in 25 countries on 5 continents, working for companies like Google, Electronic Arts, and Santander, among others.
- We were named a Worldwide Leader in CX Improvement Services by IDC MarketScape report.
- We were also featured as a business case study at Harvard, MIT, and Stanford.
- We are a member of The Green Software Foundation (GSF) and the Cybersecurity Tech Accord.

For more information, visit

www.globant.com

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