

The Future Is Here: How LLMs Are Revolutionizing Automotive

The Basics of LLMs

Large Language Models (LLMs) are sophisticated AI programs built of advanced neural networks trained on vast datasets to recognize, respond to, and generate human-like text when prompted.¹ They use deep learning to understand language, with their effectiveness dependent on the quality and breadth of their training data.

Neural networks got their start in the 1950s, designed for basic pattern recognition.² A major breakthrough in 2017 significantly improved text understanding and generation leading to modern advancements that allow AI to chat, write, and engage in conversations that feel almost human. From the first chatbot in the 1960s to modern models like GPT-4 and Google's Gemini, LLMs are now a part of everyday life, with adoption moving at an unprecedented speed.

Technological advancements like cloud computing³ and increased data availability⁴ have made it easier to develop and manage LLMs. Tasks that once took hours can now be completed in minutes or even seconds with incredible accuracy. At the core of LLMs are often AI agents that perform prompted tasks while LLMs handle the natural language processing.



Step 1: The user assigns the LLM a task and the AI agent determines how to achieve it.



Step 2: The agent executes the necessary work behind the scenes, utilizing additional specialized agents to achieve specific tasks.



Step 3: If needed, the agent requests additional user input to refine the response.



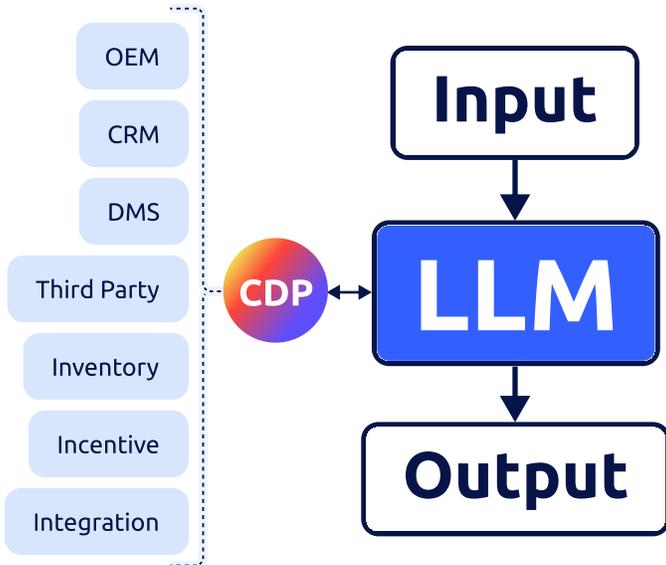
Step 4: The agent completes the task and returns the result via the LLM which processes results into text.

The Impact of LLMs on the Automotive Industry

Large Language Models (LLMs) are quickly advancing from only using data they have been trained on to leveraging autonomous AI agents capable of performing complex tasks. Unlike traditional models that respond solely to prompts, modern AI agents integrate natural language understanding with decision-making and action execution, often working across multiple data sources to automate workflows.

- 1 [What is a large language model \(LLM\)?, Cloudflare, 2025](#)
- 2 [The Evolution of Neural Networks and Their Powerful Role in AI Technologies, Sidecar, 2024](#)
- 3 [In-Depth Guide to Cloud Large Language Models \(LLMs\), Gaper, 2025](#)
- 4 [Training Compute of Frontier AI Models Grows by 4-5x per Year, Epoch, 2024](#)
- 5 [What is an AI agent?, McKinsey, 2025](#)

The industry is quickly hitting the AI 'ride or die' stage



The introduction of AI agents is dramatically widening the divide in the automotive space between those who are adopting AI and those who are hesitant to make the leap. Early adopters in the industry began integrating and leveraging their first-party data early on, and were already prepared for AI applications as soon as they came to market. The industry is quickly hitting the AI 'ride or die' stage where automotive leadership must take data connectivity seriously and begin integrating AI into their day-to-day operations, or risk falling irreversibly behind their competitors.

The areas of focus should include:

- **Managing Customer Data:** LLMs can quickly mine data to generate actionable insights and activate that data in a variety of impactful ways with identity resolution, audience segmentation, and lead scoring.
- **Customer Tailored Customer Experiences:** Companies across the industry can leverage LLM capabilities combined with generative AI to utilize customer data for tailored marketing communications, sales approaches, and website interactions.
- **Supply Chain Optimization:** LLMs can be leveraged to optimize inventory procurement, logistics, and cost. LLMs also monitor and predict trends, enabling inventory forecasting to identify supply needs and constraints.
- **GPT for Categorization:** ChatGPT chatbots can simplify and automate data categorization tasks that would otherwise require significant manual effort, such as customer intent for sales prioritization.

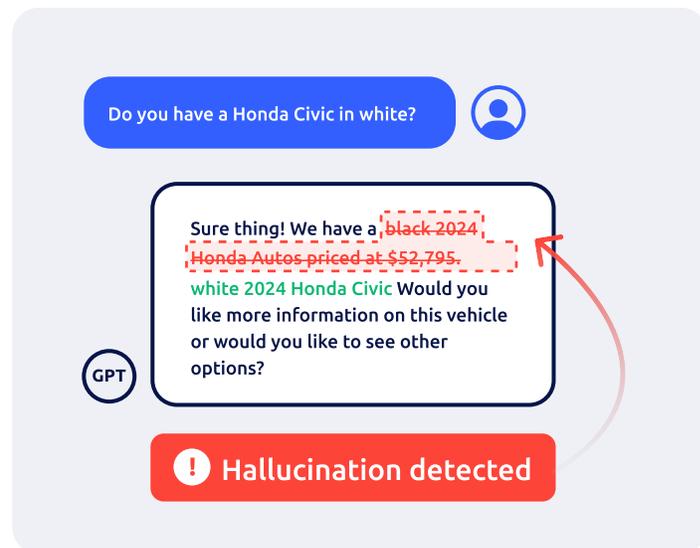
A specific example of how LLMs can improve efficiency in automotive is their ability to filter out bot submissions or irrelevant leads.

LLMs can automatically analyze incoming leads before they reach the sales team, identifying whether a lead is legitimate or spam. What once required manual effort or relied on often inaccurate keyword blacklists, can now be addressed by building an LLM workflow with an AI agent trained on that specific task.

Once configured, LLMs can be managed by anyone familiar with basic inputs and desired outcomes. General managers, marketing managers, salespeople, and other non-technical staff can harness the power of LLMs directly, accelerating AI implementation. By democratizing access, innovation becomes possible at every level of the organization.⁶

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With accessibility in mind, AI enables people to become generalists in their field, while specialized work can be handled by AI agents trained for hyper-specific tasks. Consider the automotive group marketing manager who, until now, had to be a digital advertiser, social media manager, data analyst, and strategist all at once. By leveraging LLMs, dealership employees can focus on their strengths and delegate more time-consuming tasks to AI.



What's the Catch?

While early adopters across automotive have embraced LLMs and AI, the industry has been notoriously hesitant to rush into drastic technological change. Their hesitance is not without reason; as with any new technology, there are inherent risks, many of which are outweighed by the potential they have to grow businesses and elevate customer experiences.

The potential of an LLM is nearly limitless, but the complexity of prompts can increase the risk of inadequate training or context, leading to outputs based on fabricated or irrelevant information⁷, known colloquially as "hallucinating." While unpredictable queries pose challenges, they also showcase an LLM's strength: the ability to attempt a response to an almost unlimited range of questions, making them powerful and versatile tools.

⁷ [What is a large language model \(LLM\)?, Cloudflare, 2025](#)

To build an effective LLM, they must be trained on large data sets, possibly exposing the AI to sensitive data. It's crucial to implement robust security, privacy, and compliance measures from early development through deployment. Risks like data breaches, manipulation, poisoning attacks, and overreliance require ongoing oversight by qualified professionals who understand how to mitigate vulnerabilities and enforce controlled access.⁸

Another key concern is bias, which can impact decision-making in areas like financing and customer service. Models trained on societal data may reflect prejudice, unintentionally perpetuating unfair treatment or skewed outcomes.⁹ By prioritizing transparency and accountability, dealerships can ensure their AI supports equitable, ethical decision-making.

Key strategies to manage these risks include:

- Instructing the LLM to only use verified information
- Requesting references to verify facts
- Oversight from qualified professionals
- Secure training
- Regular audits
- Updated breach response plans
- Ongoing monitoring

With these strategies in place, dealerships can leverage LLMs effectively while minimizing security and privacy concerns.

Cost-Benefit Analysis

Implementing new technology involves costs - financial, operational, and training. Starting small allows for integration without a large upfront investment, but as teams become more proficient and usage increases, costs for support and expansion may rise.¹⁰

Managed LLMs

- Ease of deployment and maintenance
- Comes with dedicated support
- Limited customization and control

VS

Open-Source LLMs

- Full control and customization
- Data privacy and ownership
- Requires specialized technical knowledge

There are two main types of LLMs: managed and open-source. Managed LLMs, provided by cloud providers, are easier to deploy and maintain but may incur ongoing costs and offer less flexibility. Open-source models offer more control and customization but demand greater technical expertise and infrastructure. The choice of what to implement depends on the dealership's technical capabilities, workflow, and customization requirements.¹¹

⁸ [Large Language Model \(LLM\) Security: Challenges & Best Practices, Lasso, 2024](#)

⁹ [Ethical Considerations in LLM Development, Gaper, 2025](#)

¹⁰ [Breaking Down the Cost of Large Language Models, Qwak, 2024](#)

¹¹ [Open-Source LLMs vs Closed: Unbiased Guide for Innovative Companies, Hatchworks, 2024](#)

LLMs are rapidly improving in generating realistic, empathetic dialogues for dealerships, helping customers feel heard and valued.

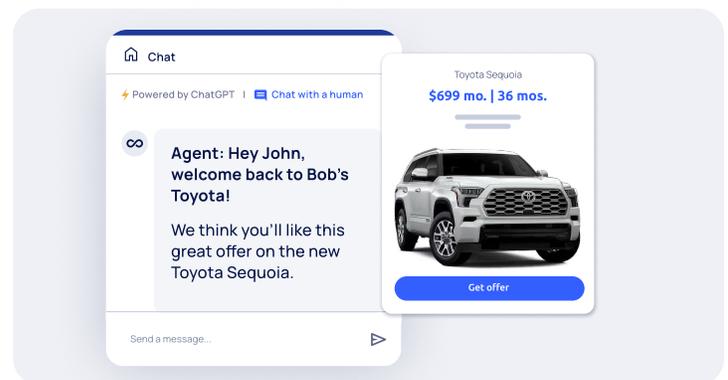
The Future is Here

Looking forward, the automotive industry will shift to seamless, integrated AI systems that reduce manual tasks by integrating specialized agents. Expect to see more automated processes—like real-time lead scoring, updating customer profiles, and AI-driven scheduling—demonstrating full, dynamic responsiveness. LLMs will become more sophisticated, with interactions continuously enriching the dealership's data layer, leading to better personalization and smarter decision-making.

Anticipated Breakthroughs and Emerging Technologies

While AI was once thought incapable of convincingly mimicking real conversations, LLMs are rapidly improving in generating realistic, empathetic dialogues for dealerships, helping customers feel heard and valued. They are also becoming better at predicting needs—sometimes even before the customer is aware of their next interest—based on existing data and conversational replies.

LLMs will go beyond relying solely on pre-trained datasets, increasingly accessing external sources and referencing them accurately for more comprehensive, up-to-date responses. This will enable better integration into dealership tools, providing immediate, precise answers for teams and customers alike.¹² AI systems that handle language along with speech, images, or video known as large multimodal models, are quickly advancing, making it easier for dealerships to craft personalized, sophisticated marketing content tailored to individual preferences.



As more consumers turn to generative AI search tools like ChatGPT instead of traditional search engines, Generative Engine Optimization (GEO) is quickly replacing SEO, or Search Engine Optimization. Leveraging GEO, dealers can make automotive content more accessible and relevant within AI-generated responses. LLMs support this shift by enhancing the accuracy and responsiveness of digital touchpoints, transforming online engagement and how customers find and interact with automotive information.

¹² [The Future of Large Language Models in 2025, AI Multiple Research, 2025](#)

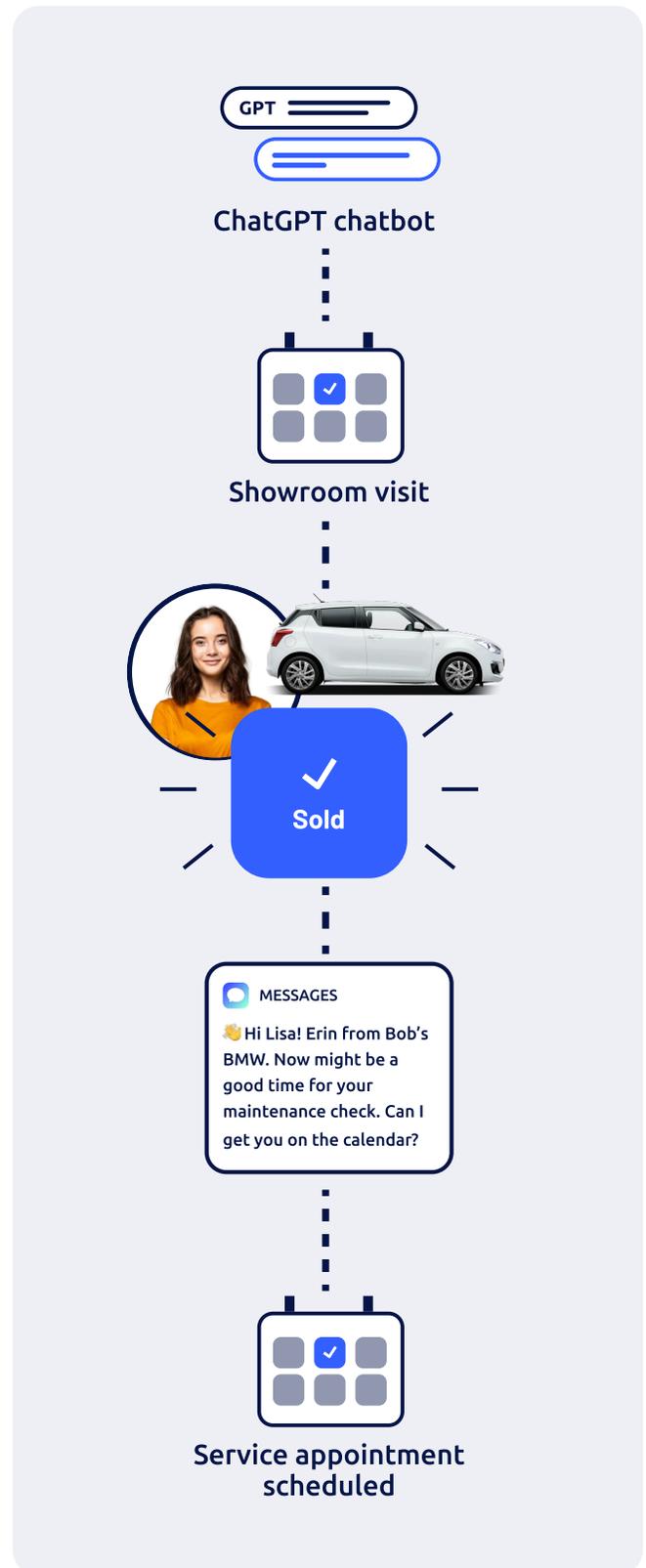
Agentic Systems

Agentic systems are among the most promising AI advances set to impact the automotive sector. While current LLMs primarily generate responses to text-based queries, agentic AI can handle more complex, multi-step tasks. These systems ingest large amounts of data from multiple sources, not only providing answers but also developing strategies, making decisions, and executing actions autonomously.¹³

For example, AI agents could manage the entire customer post-sales experience—from scheduling service appointments, coordinating maintenance, and ordering parts to proactively engaging the customer for a new vehicle purchase.

It could determine the optimal timing for sales to re-engage the customer based on factors such as remaining lease payments, positive equity, or their interaction with the dealership's website. In fact, over one-third of customers have expressed willingness to use an AI agent for scheduling service appointments,¹⁴ indicating a strong preference for this streamlined, contactless process over manual booking.

With the ability to answer queries and take meaningful action, agents will increasingly influence what dealership customers see and experience.



¹³ [What Is Agentic AI?, Nvidia, 2024](#)

¹⁴ [U.S. Drivers Look to AI Agents to Improve Car Buying and Ownership, New Survey Reveals, Salesforce, 2025](#)

While this may sound futuristic, it offers a tremendous opportunity to guide car shoppers along the sales journey, creating more engaging, personalized interactions in the here and now.

Conclusion

The future of LLMs in automotive retail is smarter, more integrated, and highly personalized and centralized, real-time data will be the key driver of success. AI is only as good as the data it's trained on making unified, clean data a critical part in delivering deeply tailored and effective experiences.

The evolution of LLMs and AI will extend beyond reactive responses. Routine tasks like answering calls or managing inquiries will become automated, freeing staff to focus on higher-value, relationship-driven activities. Leveraging data-driven insights, **AI agents will become key players in the car buying process—guiding shoppers and dealership teams from initial interest through to the final sale and beyond.**

