

McKinsey Center for Future Mobility

Gen AI in high gear: Mercedes-Benz leverages the power of ChatGPT

Philipp Skogstad, CEO of Mercedes-Benz R&D North America, shares the story of bringing generative AI to 900,000 beta testers and discusses the vision, impact, challenges, and path forward for generative AI applications in the automotive sector.



Philipp Skogstad, CEO of Mercedes-Benz R&D North America, joins McKinsey's Matías Garibaldi on the *Drivers of Disruption* podcast to share Mercedes-Benz's experiences and vision for integrating generative AI (gen AI) into its vehicles. Also joining is Ben Ellencweig, senior partner at McKinsey and global leader of QuantumBlack, AI by McKinsey, Alliances and Acquisitions, and board member of Iguazio, a data science platform to automate machine learning pipelines.

Gen AI is a type of artificial intelligence capable of producing highly realistic and complex images, videos, audio, and text that mimic human creativity. The potential for gen AI across many different sectors is clear, with an expected annual impact of around \$6 trillion to \$8 trillion.¹

As one of the first applications of gen AI in the automotive sector, Mercedes-Benz recently used ChatGPT, an implementation of gen AI, to power voice assistants in a beta program available to more than 900,000 vehicles. In this episode, Skogstad describes how the ChatGPT-powered voice assistant was brought into reality, the importance of rapidly iterating through such software ideas, and Mercedes-Benz's strategy to data privacy and security when using gen AI. Ellencweig and Skogstad explore future possibilities with gen AI in the automotive value chain, citing opportunities for impact across repair and diagnosis, sales, personalized marketing, and R&D. They also discuss potential risks associated with using gen AI and insights for automotive leaders on harnessing its potential. An edited transcript of the conversation follows.

Podcast transcript

Matías Garibaldi: Hello and welcome to *Drivers of Disruption*, a podcast covering the latest advancements in mobility, as well as current challenges and solutions in the space. My name is Matías Garibaldi and today's topic of conversation is the use of generative AI (gen AI) in the auto sector. Gen AI has been

front and center since the launch of ChatGPT in November 2022, although the technology already existed for many years. Over the last few months, there's been a lot of debate about how gen AI will impact different industries, our way of working, and our way of life.

So we're very excited to welcome two experts in this space for this episode. Our first guest is Philipp Skogstad, president and CEO of Mercedes-Benz R&D, North America, where he focuses on topics ranging from autonomous vehicles to connectivity to infotainment. Mercedes-Benz opened the first OEM R&D facility in Silicon Valley in 1994 and is the first automotive manufacturer to integrate ChatGPT in their vehicles, which is currently being beta tested with 900,000 users. Welcome, Philipp.

Philipp Skogstad: Thank you, Matías.

Matías Garibaldi: Our second guest is Ben Ellencweig, a senior partner at McKinsey & Company and global leader of QuantumBlack, the company's data and analytics center of excellence. He leads McKinsey's gen AI initiative, and is a board member of Iguazio, a data science platform that automates machine learning, which was recently acquired by McKinsey. Welcome, Ben.

Ben Ellencweig: Thanks for having me.

Matías Garibaldi: Ben, to kick us off, I wanted to give you the opportunity to help our listeners by providing a short introduction on gen AI. How are different companies utilizing it already, and how does McKinsey think companies can further create value using gen AI?

Ben Ellencweig: It's a super exciting topic. Gen AI burst into our lives earlier this year with ChatGPT. Whether you played with a toast or a roast or planned your vacation using this powerful technology, it actually had been around for the past six or seven years. It started in December 2017 with a transformer model, the "T" in GPT, coming from Google, and has evolved since then.

¹ "The economic potential of generative AI: The next productivity frontier," McKinsey, June 14, 2023.

We're seeing it deployed in four main categories that enterprises, including automotive, are starting to adopt. One is around software, the ability to co-develop different software applications with the machine, which we call the copilot. The second involves customer engagement in service or sales, where a copilot could offer call summarization and hyper-personalization to create a very different experience. The third category is concision, making things concise and synthesizing them. Gen AI is almost a virtual knowledge system that can go through documents, such as product development or safety protocols, ingest them all, and provide a clear answer. Finally, there's content generation, the holy grail of "segment of one," creating a unique experience for each user, such as an automotive marketing campaign or a personalized user manual for a new car.

Matías Garibaldi: That's super helpful. Philipp, I want to shift over to you because Mercedes-Benz is the first automotive producer to integrate ChatGPT in their vehicles, which I think was announced on June 15. How did the idea come about, and how did you get from there to involving 900,000 customers in a beta test?

Philipp Skogstad: If you think about Mercedes, you might remember we invented the automobile. We've always been a leader, and we continue to carry that tradition forward. As you mentioned, ChatGPT's latest version came out at the end of last year, and it was already installed in my car just after the new year, in time to demonstrate it at CES [the Consumer Electronics Show] in

January, where it met the approval of the chief technology officer for all of Mercedes.

During our capital markets day in February, we showed it to influencers, analysts, and media from around the world, and the feedback was very, very positive. That encouraged us to bring this technology to our customers. And we wouldn't be Mercedes if we didn't do it quickly but also responsibly. We're very glad our culture enabled us to be the first by iterating early on, installing it in my car, and then rolling it out in a beta program.

We enabled all our US customers to opt in, either via their Mercedes app, or from their car, where they can just say, "Hey Mercedes, I wanted to join the ChatGPT beta program." At that point, your Hey Mercedes voice assistant will continue to deliver all your navigation and vehicle control functions you're used to but draw on a broader domain via ChatGPT technology.

Matías Garibaldi: That's amazing. How large was the team? It seems like it was bootstrapped in certain ways. You test it in your vehicle first, show it at CES, and then download it in 900,000 vehicles. It seems like faster-than-normal automotive developmental time frames, right? How did you move so fast?

Philipp Skogstad: That's a great question. I think you're alluding to some of the challenges we face in the automotive sector because of our multiyear development and production

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cycles. We may be working on a car today that a customer won't see for ten years. On the other hand, being Mercedes, our customers are used to getting new digital devices all the time and expect them to be state of the art.

So we have united but divergent pieces of software and hardware and need to make sure the two always connect, which is a key part of my responsibility. And in this case, it was a bootstrapped effort involving many teams. Enabling the beta program required changes in the app, as well as bringing in legal and data security colleagues. As this effort evolved, we kept iterating and keeping the customer in mind. There was always this very clear focus, and I thought, "We have a great feature. We've seen it work in my car. Let's have as many customers as possible benefit from this as quickly as possible." We launched in the US, but we're not going to stop here.

Matías Garibaldi: I think that's an awesome story. I want to dive into one more part of this story, the iteration, and how you navigated that with your team. There's a balance between iterating to arrive at the best solution as quickly as possible and having some apprehension at continuously iterating instead of bringing the customer the final product. What was your iteration mindset over the course of those months?

Philipp Skogstad: Mercedes's slogan is "the best or nothing." And I sometimes need to remind the team that even though we have something really good, we should keep iterating to make it better. For those of us familiar with software, especially cloud software, that's the culture of having a fixed release cycle and a need to get something out there very quickly. I keep telling the team that if you've got a subway that runs every ten minutes, you're not worried about catching the next train, because there's always one more. It's the same with software. We need these fast iterations that enable continuous releases, and that's what we're setting up all our systems to do.

Matías Garibaldi: I think that's fascinating—merging the software mindset with some of the automotive hardware mindset. I think there's a lot of growing to do there, and it must be really interesting to see these things in action.

Philipp Skogstad: But what's important with all this is to ensure our customer safety first and foremost—their physical safety as well as their digital safety. And handling customer data responsibly is absolutely key to ensuring the privacy of our customers throughout the entire process.

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Matías Garibaldi: That makes a lot of sense. What are you excited about in regards to the possibilities of gen AI and what it can unlock for the future? Where will the multiple iterations lead—two, three, five years down the road—in terms of how humans interact with vehicles?

Philipp Skogstad: I'm not at liberty to discuss the detailed roadmap of Mercedes, but I think, as Ben said earlier, it will have an absolutely transformational impact on all parts of our work, our personal lives, and how we interact with each other and our cars. Right now, we've implemented ChatGPT through voice. We're seeing more and more intelligent assistants all around us in our lives, and we want the car to be part of that.

For example, say you have a 7 a.m. meeting in the office tomorrow morning, you live in a northern state and it's wintertime. If you've given your car access to your calendar, it can see it might be a little icy and let you know you might want to leave the house at 6:15 instead of your usual 6:30. And at 6:15 the next morning, your car will already be running and heated, and it might tell you as you get in, "You've got this meeting. Would you like to listen to this news channel that might be relevant during your drive to the office?"

It's not the car by itself but in connection with the wider world, and with that ability, as Ben said before, to look forward and generate usefulness in your life. That's where we want to go, and we're working on it in that iterative fashion.

Matías Garibaldi: That's super exciting. Now I want to shift over to Ben. We've been talking about the customer aspect of this technology, but McKinsey mentioned in a recent article that 75 percent of the value of gen AI in specific use cases falls under four major areas: customer operations, marketing and sales, software engineering, and R&D. Looking ahead, what do you believe holds the most promise for gen AI in the automotive industry? What are some examples of what we're going to see outside of the voice activation use case?

Ben Ellenweig: Predicting the future is very dangerous. I would probably be in a different profession if I could. But that said, I spend a lot of time with senior folks in the industry who are building those large language models [LLMs] across all companies. Many of them would say we have already reached a point they once thought would have taken another 20 years, so we are moving at a laser-speed pace, and it's just going faster and faster. But we have to remember this is early days of the first inning.

So let me bring it to life a little bit, to answer your question. I love Philipp's example of the car, which basically becomes part of our daily lives. We're all going to have virtual assistants writing memos and preparing us for meetings. They're also going to be composing music, whether it's a new song by the Beatles or anything else. But what's interesting is to look at the holistic ecosystem beyond the consumer and think about the technician that services your car when you bring it to the dealer. Gen AI has the ability to guide the technician, to identify the problem and quickly pinpoint how to solve that problem.

The next time you walk onto a showroom floor, think about the ability of a copilot to hear your conversation with the salesperson and guide both of you. We're talking about creating a very tailored experience that addresses your needs as a consumer. Or think about the marketers. Before, it was all about taking a camera crew and a few Mercedes cars out to Death Valley and taking some pictures. Generative AI can actually produce that ad and put anyone in the car. So marketing campaigns will be targeted to individual consumers based on their preferences and experiences.

So from a salesperson perspective, a dealer perspective, and a marketing perspective, things are really going to change. From an R&D and product-development perspective, I

think gen AI is one of the upcoming categories moving faster than we expected. I have an industrial CEO client who likes to say, “I’ve got some CAD [computer-aided design] drawings in my attic, some safety protocols in my basement, and some emails. Can you help me connect the dots?” Gen AI can do that.

Now we can let our engineers focus on the creative side of things while gen AI connects all those dots and simplifies the experience of reimagining components and understanding how they all fit together. I think it’s very exciting, especially for automotive software, which is becoming such a core part of the vehicle. The timing could not have been more perfect. But Philipp, I’m curious, what are your thoughts about how gen AI will change your role in terms of product and R&D thinking?

Philipp Skogstad: I totally agree with everything you’ve said, Ben, and think it even goes beyond that. I think it’s in R&D, in production, and in sales. It’s also about the customer learning the features of their new vehicles. In America, almost nobody comes home and reads the manual. In other parts of the world, you have two-hour sessions at the dealer where they explain the car to you. Most of the time, American customers are on the go and ready to jump in their new car and drive off.

You can also predict when somebody is most likely going to benefit from a certain feature. For example, you may not be familiar with advanced driver assistance systems [ADAS] that can keep your car in your lane and vary your speed with the car in front of you. The car can now provide a personal tutorial at the right time and place. It will also impact production, parts reliability, servicing intervals, all those things. When you can predict more, you can be more forward-looking.

And during development, you can run a lot of safety compliance checks in the background in an automated fashion—but not the final check, since I firmly believe a human has to be the

final point in that loop. But you can automate the path there, because we all know it’s a lot easier to modify a draft memo than writing one from scratch. And I think generative AI can help us a great deal with that initial tedious part of the work. But it still requires human intelligence to deliver the right prompt in the first place. I think humans will always need to stay in the loop, and human intelligence will always be key.

Matías Garibaldi: I think that’s a really important point and a great segue to the next question that I had for both of you, one that comes up every time we discuss gen AI or AI in general. You always need the human in order to provide the right prompts and perform that final check. But a lot of people are worried about this technology. How do you see employees impacted or enabled by this technology? And what steps are needed to educate and train employees to effectively use and manage gen AI technologies? Ben, do you want to go first?

Ben Ellencweig: Happy to, since we get this question a lot, and it is an important one. I think we have to remember, whether it was the industrial revolution, the internet, or mobile phones, every technological innovation includes a difficult transition period. Once people get used to them, they change their workflows and companies change their business processes. And new technology actually brings a lot of advantages to the table.

People always talk about productivity, to which I always reply, “Think about what we’re doing now.” In the future, gen AI could actually create some of the insights we’re talking about. We can also create, with deepfake, a synthetic person to replace us. Does that mean Philipp and I are out of a job, or does it mean we just got a few hours back to spend on creative tasks gen AI cannot do on its own?

I think the answer, for me, is about managing transitions. At the end of the day, calculators did not fully replace mathematical activity, and Excel improved our productivity without replacing us. Gen AI is a great addition to any activity that requires creativity and needs human interaction or leadership. And if managed correctly, gen AI can help employees be happier, more content, and focus on what they love doing. I think the key is education. It's really important for people to touch technology and understand its potential. It's also very important to manage the change both educationally and culturally. Finally, I think it's critical to redefine certain tasks that can now be done by machine.

Philipp Skogstad: I agree with everything Ben said. I think AI is a key enabler. There is a transformation under way, and I think all of us like to drive change. People want to drive change, but they don't want to be changed. So the key here is to let people drive this transformation and to give them access to generative AI so they can play with it themselves. We couldn't live without any of the technology transformations you mentioned, Ben, but they were scary to people at first.

I think it's not just education in a traditional sense, like a lecture; it is enablement. We're enabling developers to use sandbox

environments so their data stays within Mercedes. We want them to try out the technology in a safe way and iterate their way forward, like we did when we introduced ChatGPT to our cars. I think then we'll actually be able to automate a lot of the tedious tasks currently preventing us from doing more value-added activities.

Matías Garibaldi: I think that's a great point, and you hinted at this next topic in two of your answers on consumer data sharing and data security, a topic front and center when talking about gen AI. A lot of consumers are curious about data security, especially when it comes to sharing their personal information. How is Mercedes addressing these concerns when utilizing gen AI?

Philipp Skogstad: Safety is absolutely key for Mercedes, and a cornerstone of our reputation. Whether you are talking about physical or digital safety, both need to be treated with the utmost importance. So if you look at how we use ChatGPT, the data stays within Mercedes, with you and your car. It's in our Microsoft cloud, which your other vehicle data isn't. But everything is exactly disclosed in terms of what goes where in our permissions.

“Whether you are talking about physical or digital safety, both need to be treated with the utmost importance. So, if you look how we use ChatGPT, the data stays within Mercedes, with you and your car. None of it is shared back with OpenAI or ChatGPT, so it cannot be used to train it for future answers.”

None of it is shared back with OpenAI or ChatGPT, so it cannot be used to train it for future answers. That's a key point, avoiding data leakage. The same holds true for our internal projects. We're using the same rules for our own data as we do for our customer data to make sure it doesn't escape.

Matías Garibaldi: That makes a lot of sense. Ben, in regards to the topic of data security, I would love to dive deeper into this topic of ethical or legal considerations. What are some of the key risks OEMs should be aware of, and how should they navigate these challenges to ensure the responsible use of gen AI?

Ben Ellencweig: Again, this is a new technology. It's a whole new paradigm for us. We're still learning it as a society, as enterprises, and in the automotive ecosystem. We like to talk about responsible AI, but generative AI is not perfect. You've probably all heard of gen AI hallucinations, which is when ChatGPT completely fabricates information. The models are so sophisticated and the answers are presented in such a profound way that you take it as a solid fact or a truth.

But many times, the large language model, on which gen AI chatbots like ChatGPT are based, are just wrong. Maybe it wasn't trained properly, or you're asking something relatively new the model is still learning. There's also a question of how you train the model, and we've seen issues with biases based on the training material used for the model. In terms of ethical use, let's not forget that at the end of the day, underlying the models is a whole host of structured and unstructured data that you need to think about how to manage. And obviously, we're connecting our own system to other organizations in the outside world, which also poses a risk. We're seeing two approaches, with some organizations blocking access to gen AI completely, while others are enabling it out in the open.

In terms of responsible use of AI, I would make two points. One, establish clear guidelines

for your customers and employees, and be responsible, especially when it comes to what we like to call explainability. Many times, you don't really understand the answer you're getting. But you need to be able to understand it by checking sources and figuring out why the model is giving that answer. And obviously, to Philipp's point, you need to apply human judgment.

Point number two is providing clear disclaimers, explaining that this is all based solely on public knowledge plus some private, enterprise knowledge, which has a huge impact on the level of accuracy or confidence in a given answer. Lastly, I do think it's important for us all, as people and as enterprises, to actually understand both the power of this technology and its limitations, so we can better assess those risks. Responsible use of AI includes legal and ethical implications, and we must realize we're still learning how to use this phenomenal technology that will disrupt every aspect of life. And sometimes, humans are not exactly fully accurate either, so it's a journey.

Philipp Skogstad: But with humans, you might get some cues from facial expressions or their eyes that make you a little cautious.

Ben Ellencweig: Yes, exactly.

Matías Garibaldi: I love that.

Philipp Skogstad: AI is the best poker player.

Matías Garibaldi: I love that point, Ben. Philipp, what are some upcoming milestones you're hoping to achieve, when you think about the goal of redefining the relationship between your customers and your cars? Based on the findings of the beta program, what will you do next? What's the long-term vision?

Philipp Skogstad: As I mentioned earlier, the long-term vision is making your car part of your digital and physical life. It is also, for most of us, apart from our homes, the biggest investment we will ever make. And with Mercedes, you certainly have higher expectations than just to take you from point A to point B. It is also a luxury good that you're buying to both treat yourself, and to make a statement. Mercedes stands for luxury and technology, and I think what that means will continue to evolve.

Installing ChatGPT in the car is one step, very iteratively done, and will continue to evolve from there over many, many increments. It's not just with every new model cycle or every new model year, but even on a quarterly and why not a weekly or daily basis? I'm a firm believer in those fast feedback loops we see when we're putting something new into a customer's hands. If we see they like it, we continue on that path. If they don't, we go in a different direction.

Matías Garibaldi: Philipp, what advice or insights would you like to share with other auto industry leaders, and leaders and stakeholders in general, to best harness the potential of gen AI for the industry?

Philipp Skogstad: Iterate fast, and don't be afraid to fail. You're going to learn a whole lot more from failing than succeeding. And that's the beauty of fast iteration, since every failure is only a small failure, not a big one. That's why I'm so fond of rapid iteration. But, like Ben said, be responsible. In each case, think through the worst-case scenario, and treat your customer data and safety responsibly.

Matías Garibaldi: I think that's a great point. Ben, what advice or insights would you share?

Ben Ellencweig: I love Philipp's push for fast iteration. I would stress the need to educate oneself on this technology, because you've got to touch it. I have a CEO client that basically instructed all 65,000 employees to try this technology by the end of the year. The second thing is to experiment with gen AI as soon as possible to discover the right business applications.

The last thing I would say is to scale. There are strategic applications that require more thinking and preparation, especially as we think about automotive manufacturing or product development. There are basically a whole host of small use cases you really need to rethink. This is no longer a five-year cycle of product development before launching a new car. This is going to be much faster.

That said, you need to do all these things in parallel. That means educating employees and consumers, experimenting as soon as possible, iterating and learning, and starting to scale core strategic use cases, which will take longer. I'm really curious to see what will happen if we get together in 12 months. We can compare notes and see how far along we are. I suspect it will be even further ahead than any of us thought possible.

Matías Garibaldi: Those are great points. Philipp, Ben, thank you so much for your time. I find this topic fascinating and it's great to speak to two leaders in the space.

Ben Ellencweig: Thank you for having us.

Philipp Skogstad: Thank you.

Philipp Skogstad is the CEO of Mercedes-Benz R&D North America. **Ben Ellencweig** is a senior partner and global leader of QuantumBlack, AI by McKinsey in McKinsey's Stamford office, and **Matias Garibaldi** is a consultant in the New York office.

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