The Industrialist

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"Technology including generative AI is like a suit that augments your people, making them a little more superhuman."

Chris Helsel
Senior Vice President, Global Operations and Chief Technology Officer,
The Goodyear Tire & Rubber Company

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How Goodyear boosts resilience in their manufacturing operations

Each month, we speak to a different industry leader about their approach to innovation and the emerging trends impacting the industrial sector. For this edition, we talked with Goodyear's Senior Vice President, Global Operations and Chief Technology Officer, Chris Helsel, about the disruptive shifts in mobility and how suppliers are responding to this challenge.

As uncertainty and volatility continue unabated in the light of geopolitical shifts, technological breakthroughs and material and talent shortages, OEMs and automotive suppliers are forced to rethink their approaches. Goodyear has been up for the challenge, ramping up their resiliency capabilities. Chris also shares how they are tackling ubiquitous manufacturing challenges with automation and digital technologies including generative AI, and a personal leadership lesson that has pushed the organization forward.

In conversation with Goodyear's Senior Vice President, Global Operations and Chief Technology Officer, Chris Helsel

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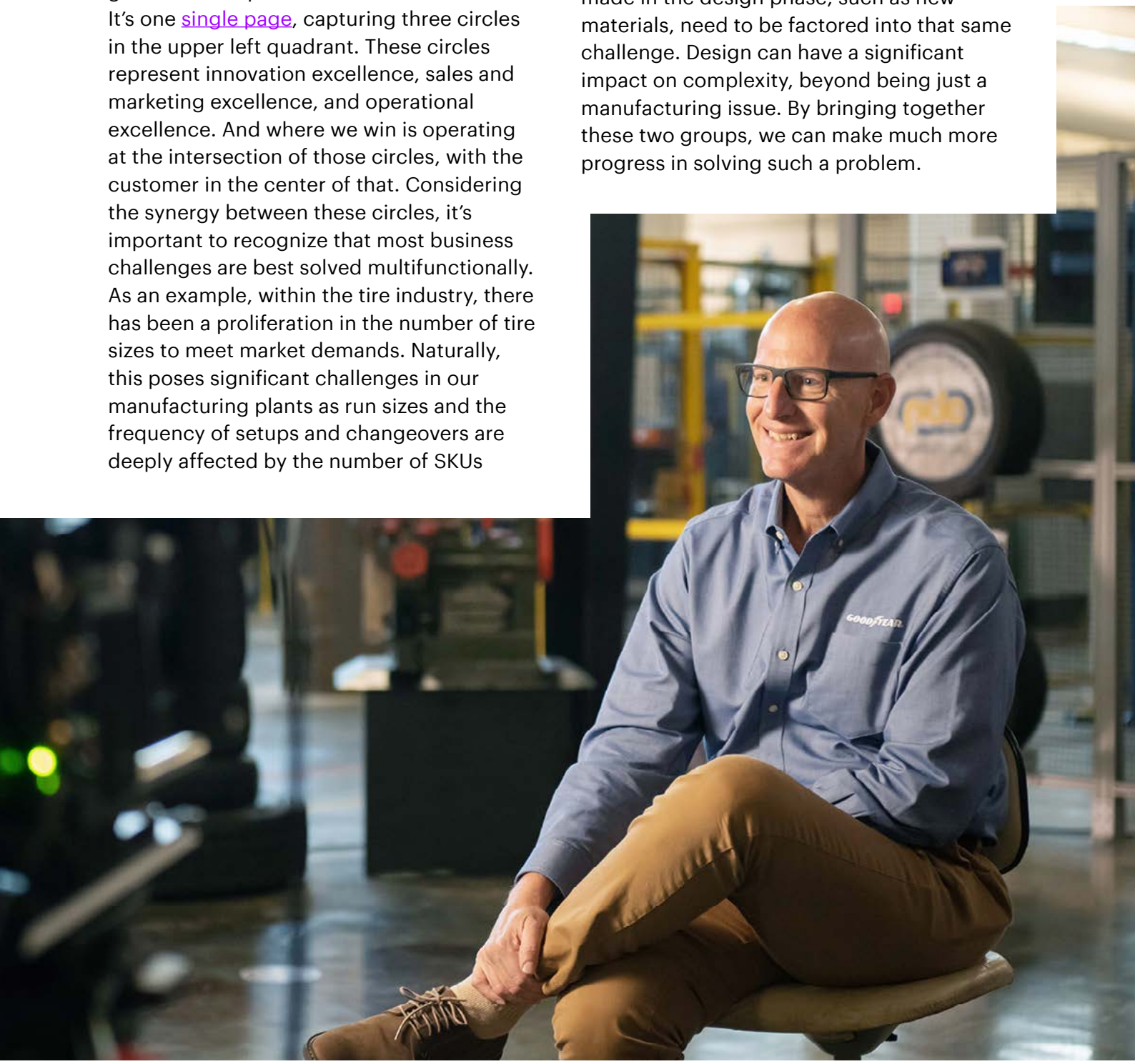
What one word describes you best?

I'd say **resilient**. I think part of resilience is to truly consider the various twists and turns as opportunities, more than anything else. When people ask for career advice and inquire how I became a CTO, I usually respond, "Just say yes." These occurrences typically signify there are some new problems to solve. Therefore, say yes, lean in, and go after it.

You have a dual role as Chief Technology Officer and SVP for Global Operations at Goodyear. How do you bring these responsibilities into play?

Our strategy roadmap—which has been recognized as a well-crafted document—guides our corporation and fosters cohesion. It's one single page, capturing three circles in the upper left quadrant. These circles represent innovation excellence, sales and marketing excellence, and operational excellence. And where we win is operating at the intersection of those circles, with the customer in the center of that. Considering the synergy between these circles, it's important to recognize that most business challenges are best solved multifunctionally. As an example, within the tire industry, there has been a proliferation in the number of tire sizes to meet market demands. Naturally, this poses significant challenges in our manufacturing plants as run sizes and the frequency of setups and changeovers are deeply affected by the number of SKUs (Stock Keeping Units) offered. What may not be immediately evident is that decisions made in the design phase, such as new materials, need to be factored into that same challenge. Design can have a significant impact on complexity, beyond being just a manufacturing issue. By bringing together these two groups, we can make much more progress in solving such a problem.



Goodyear was founded 125-years ago and has reinvented itself over time. What do you think has led to its success?

For the majority of the past 25 years that I've been with the company, mobility was a relatively stable concept: most people bought a car and utilized it roughly 5% of the time for personal transportation. However, over the past several years, there has been a significant shift in this perspective. Things like Uber have made shared transportation popular, even if it means getting into a stranger's car—what your mom and dad told you not to do—but thanks to authenticating the driver via your mobile phone, it's safe. This shift made us rethink our approach at Goodyear. Before, we focused on becoming more efficient, making incremental improvements to our products, such as better features for fuel economy or tread wear, and we were well-prepared and executed that process effectively, meaning Sales & Marketing made requests, R&D met them, and Manufacturing made the tires accordingly.

But with the changing landscape, we recognized the need to redefine what the real job is that we do, and the new ways we can do it. We reflected that the thing we uniquely do is "control the forces between vehicles and the ground". And we do that through four palm-sized patches of rubber—this is what we have been doing for over 125 years and have excelled in it by leveraging chemistry, mechanics, and even computer modeling simulations. With digital transformation however, we have explored alternative ways we could do that job. Through technology, we are now developing sensor-based insights into the real-time tire and road conditions. This data can then be utilized to enhance anti-lock braking systems and more advanced applications, such as autonomous driving. So, the key is to recognize the pivotal shift and rethink what your core job or the adjacent jobs are, and how you might do them differently with the emergence of new technologies.

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How do you see the role of ecosystem collaboration in the new paradigm of mobility?

I'll reflect on some of our own experiences and announcements in this space. At CES this year, we showcased a collaborative project with ZF on integrating information on tire and road conditions into vehicle control software for new safety features and enhanced driving dynamics. We specifically focused on predicting hydroplaning—the unsettling situation when water disrupts the grip between tires and the road, which compromises vehicle control and stability, similar to driving on ice. Our approach involves leveraging local weather data to assess the likelihood of wet road conditions. By combining vehicle data with insights from tire sensors, we detect changes in tire-road contact. Utilizing this information, we provide recommendations for safe driving speed.

In the most advanced cases, that safe speed is then being put through ZF's cubiX control system to actually slow down the vehicle, if the driver does not respond to warnings.

This example underscores the evolving landscape of collaborative innovation. It's really about the network; stakeholders at the tier-1 level collaborating to develop a product that comes with integrated features that are ready to use. If I were to make a prediction, it would likely be this: we're going to witness an increasing proliferation of this kind of collaboration, because it's exceedingly challenging for any company to possess all the competencies necessary to integrate and advance such solutions to that level of fidelity.

What role do technologies including generative AI play in the transformation of mobility?

I'd say the number one immediate opportunity for everyone is within your own **design process** within your company, and how you can revamp those design jobs. Let me give a couple of examples: one not involving AI and the other involving AI. The first one is about our journey into hardcore multiphysics simulation. This involves significant high-performance computing in collaboration with Sandia National Laboratories, that primarily work on ensuring the readiness of the US nuclear arsenal and related defense initiatives. You might wonder how a tire company is connected to them, but simulations on tires is actually quite challenging. Tires deflect more than 40% and need to roll through water and snow, which involves the interaction of multiphysics between a solid and a fluid. These analyses require powerful high-performance computing. We provide the ability to validate these simulations, and we have incorporated this into our design process. This has allowed us to combine it with a vehicle simulator, which is full-size and where our test driver sits instead of in a car. By bringing the virtual tire into this simulator, we can collaboratively perform handling approvals with our OEMs (Original Equipment Manufacturers). This is a prime example of how data enables us to work differently. Although it is not AI, once we have conducted all these simulations, we can then use machine learning to build applications based on the results. When designing tires, we now utilize machine learning applications to leverage all the previous designs we have done, making our designers significantly more efficient. Particularly if we have new designers, this provides them with recommendations on where to start with respect to all the design parameters before they even begin the large-scale simulation work. In summary, there's a lot within your control. Take advantage of these opportunities.

The second aspect lies behind applications like the hydroplaning example: it´s about **algorithms** that have been developed similarly using machine learning. So, there´s the internal efficiency that you can drive and your external products that you can enhance by leveraging these technologies in different ways. However, the most fascinating aspect of this is the **people element.** As I mentioned earlier, our employees are changing the way they work. But what's even more interesting is an application we recently developed using generative AI. We have millions of technical documents, given our 125-year history as a materials company. Using generative AI, we built an application that facilitates much easier access to this information than manually sifting through countless papers. Within seconds, it provides insights from past experiences with specific materials. Imagine the increased efficiency your employees can achieve with this tool, especially in tasks that are not directly rewarding. The true reward lies in utilizing the information and taking action. Think of it as a suit that augments your people, making them a little more superhuman. There are plenty of such opportunities out there.

Let's talk about manufacturing operations and the challenges manufacturers are facing such as aging plants and assets, talent shortages, etc.: how do you see the role of technology and automation on that side?

I´ll start with **automation.** When it comes to manufacturing, the number one priority is making the workplace safer. Automating processes significantly enhances workplace safety, especially in tire plants where workers traditionally have close interactions with machinery and are even rotating parts. At Goodyear, we've embarked on this journey of automation, prioritizing the safety of our workforce as the foremost imperative. We are moving employees further away from the machines and ensuring that our environments become increasingly safer. Alongside safety, automation also brings benefits in terms of repeatability and greater consistency in the manufacturing process, resulting in improved product quality and reduced variations. This, in turn, leads to better flow and efficiency in operations.

Additionally, automation addresses challenges related to factors increasingly prevalent in today's competitive landscape, such as cost structures and the scarcity of skilled labor and related competition for talent. To be concrete, automation really resonates around four dimensions—and we've been actively investing in that, particularly in areas such as tire assembly and transportation pieces. In the plants where there is moving equipment such as transportation components, we have gantries, conveyors and similar machinery, that are eliminating the need for manual handling by employees. It is worth considering the types of jobs that people want to do and those they do not. Typically, the jobs that people do not prefer should be the first ones to be automated. This approach not only enhances safety and ergonomics but also provides various other benefits.

Furthermore, the **integration of IoT** (Internet of Things) technologies has empowered us to gather data from sensors deployed across our manufacturing facilities. This data allows us to gain insights into production processes, identify possible variations, understand causations and enable us to take more surgical actions on these concerns. By leveraging this data-driven approach, we can centrally manage equipment across our global network of tire plants and optimize operations. Consider the level of expertise required for an individual to possess such knowledge about a specific piece of equipment. It takes years of experience to acquire such proficiency, while these technologies are now enabling one to be more effective in a much shorter time. So, I´d argue that manufacturing is exactly parallel to the challenge of improving the efficiency of your engineers. The parallelism between these two exists.

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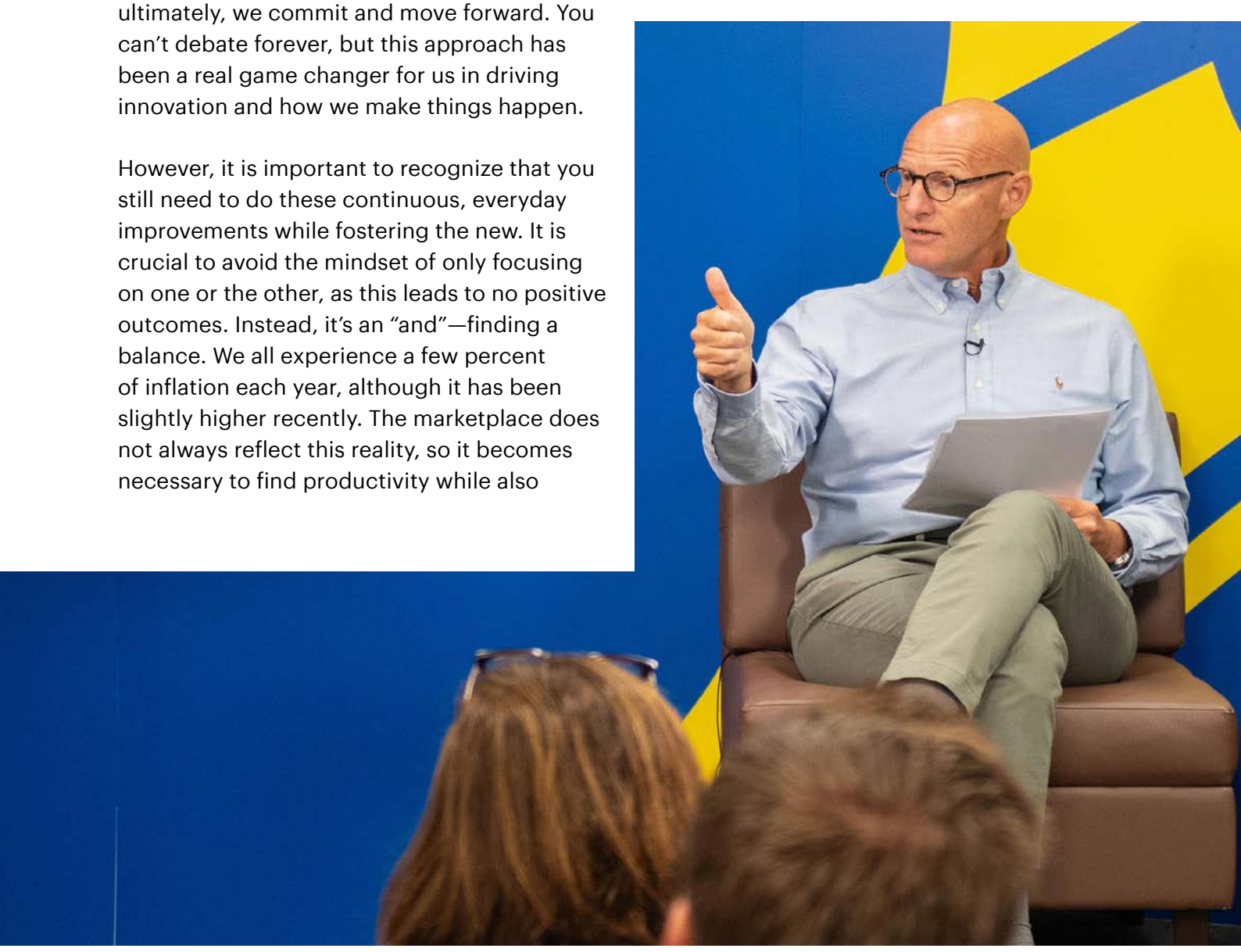
What do you see as critical to set up your organization for future success and make your workforce future-ready?

I'll start by sharing a personal leadership learning: I had been serving as the Chief Technology Officer for a couple of years, and at the time, I couldn't understand why the organization was still so focused on productivity when there was so much change happening in mobility. How come they're not seeking new solutions? Then, one day I looked in the mirror and realized, "Because you never asked them for that." So, the first step is to ensure that you clearly communicate your expectations and priorities to your team.

In our case, we used the "playing to win" approach, outlined in the book of the same title, and laid out aspirations—bold goals, as we call them at Goodyear. The intention behind this was to address the fact that we weren't being asked for these stretch solutions. For example, one of our goals is to develop a tire made entirely from sustainable materials by 2030. Nobody had requested that, but we recognized the growing focus on sustainability and the need to explore alternative materials. We presented these goals—six on the technology side and six on the operations side—to the organization, and the initial response we received was positive enthusiasm. However, they also asked us how they should go about achieving these goals. This was a moment of vulnerability we hadn't really shown as leaders, as we told them we didn't have the answers and that "We need you to help figure it out". This prompted the organization to get their heads-up, to be proactive and go search for the solutions. It became clear that they couldn't solve such complex problems by simply working harder using old approaches. It's important to note that opportunities for continuous improvement still always exist within the organization. However, to get people to really step out and truly inspire them to think new ways of doing things, they need to come to that conclusion by themselves. Once you unlock that mindset, it's crucial to support your team. When they come back with ideas they want to pursue, you must back them up with resources and prioritize their efforts. Otherwise, they may perceive it was just a game, and not a genuine priority for you.

Fortunately for us, our teams have really embraced this concept and are driving these initiatives forward. We have several projects underway, including step changes in our operations to eliminate waste, and achieve 100% renewable energy in our manufacturing footprint. Many of these initiatives are now integrated into our corporate responsibility report. It's been quite a journey over a few years. We started with this in technology in 2020, added operations in 2022, and now my staff—these two teams—meet monthly to track progress. However, the most important aspect is to ensure that we have the right workstreams and that we collaborate across boundaries to achieve these ambitious goals. It's a learning journey: the way they communicate and challenge each other. But ultimately, we commit and move forward. You can't debate forever, but this approach has been a real game changer for us in driving innovation and how we make things happen.

However, it is important to recognize that you still need to do these continuous, everyday improvements while fostering the new. It is crucial to avoid the mindset of only focusing on one or the other, as this leads to no positive outcomes. Instead, it's an "and"—finding a balance. We all experience a few percent of inflation each year, although it has been slightly higher recently. The marketplace does not always reflect this reality, so it becomes necessary to find productivity while also fostering innovation. If you are struggling with this, I would suggest placing a strong emphasis on your core. The first instinct during challenging times is often to cut back on new initiatives. Protect the heck out of your "new" and keep asking questions around: Why is it we do that the way we do? You may discover that in the past, additional teams were added to handle certain tasks, but now those tasks are in a sustained mode without reallocating the resources. This is where you need to go harvest and make necessary adjustments. These conversations can be challenging, but it is essential to roll up the sleeves and engage with individuals at all levels to drive these changes within the organization. The consistency over time delivers.



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With all the changing dynamics, where do you see the mobility supplier industry going in the future?

We all know the headlines of today and it is likely that everyone in the mobility industry has similar frameworks, such as the one we call "FACES": Fleets, Autonomous, Connected, Electric, and Sustainable.

These are the long-term trends that are expected to replace only personal car ownership as a solution. I believe there will always be a blend of different solutions. If you would have interviewed me two years ago, I would have stated that electric vehicles (EVs) are a done deal, following a linear path of growth. Now it has hit a transition point where certain aspects, such as infrastructure, need to catch up. Also considering, which specific purpose does this vehicle suite compared to other solutions, including the ongoing advancements in internal combustion or hydrogen technologies. Therefore, I encourage everyone to approach the future with a pragmatic mindset, understanding that it will not be this or that—but rather "and", meaning a combination of different solutions. It is coming back to resiliency and being prepared for various outcomes.

Betting solely on one solution is risky and difficult to predict accurately. Typically, those who can predict the future are either professional gamblers or stock traders. For the rest of us, it is necessary to cover our bases.

Another aspect to consider is autonomy. Many predictions suggested that it would be an instant transformation, but I believe it will be more of an evolutionary process. But we're going to get there. We already see cases such as our partner Gatik, limiting their use cases by focusing on right turns, nighttime deliveries, and prescribed routes using the same type of vehicle. By limiting variables, you can gradually expand the range of use cases. Similarly, Automated Driver Assistance Systems (ADAS) are continuously improving and becoming increasingly intelligent, evolving towards autonomy. I'm every bit as bullish on the trends. It's more a matter of how they're going to come is more evolutionary and probably a variety of solutions will likely coexist, at least for some periods of time.

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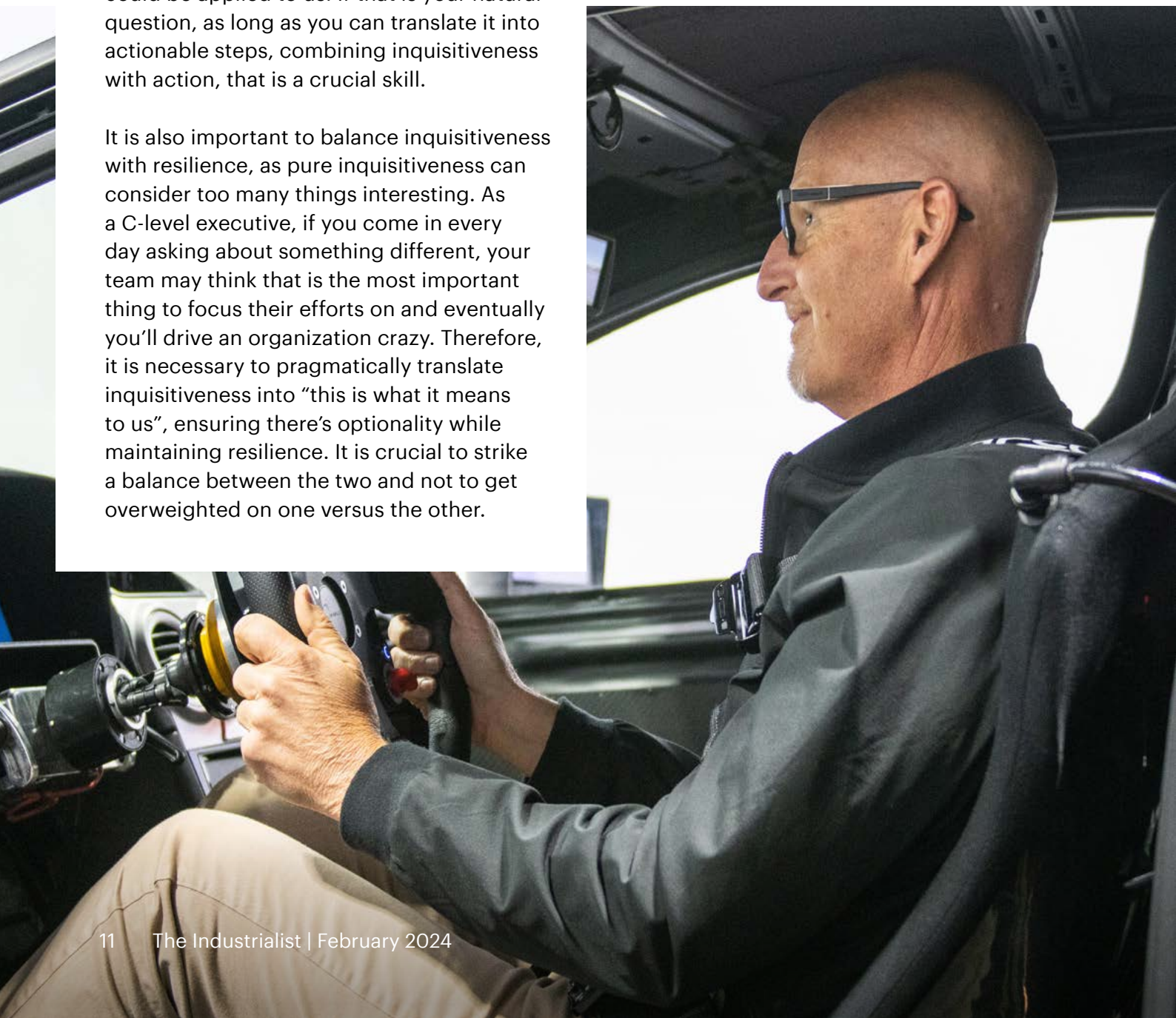
Could you describe with one word, what inspires you the most?

I'd say inquisitiveness—that's the second word that I like to relate to.

It is the underlying principle behind the bold goals—to get our heads up and be inquisitive: What does this mean for us? What are our opportunities? Rethink our approach. This mindset usually begins with a willingness to question, and pays a lot of dividends when dealing with significant changes. You may come across something in another industry and wonder how it could be applied to us. If that is your natural question, as long as you can translate it into actionable steps, combining inquisitiveness with action, that is a crucial skill.

It is also important to balance inquisitiveness with resilience, as pure inquisitiveness can consider too many things interesting. As a C-level executive, if you come in every day asking about something different, your team may think that is the most important thing to focus their efforts on and eventually you'll drive an organization crazy. Therefore, it is necessary to pragmatically translate inquisitiveness into "this is what it means to us", ensuring there's optionality while maintaining resilience. It is crucial to strike a balance between the two and not to get overweighted on one versus the other.

When I first became CTO, I probably had too much inquisitiveness. I love reading and bringing in new ideas. I actually got a coach to help control it. The coach was sitting with me through meetings, and afterwards pointed out the times when I took the conversation in the wrong direction; "they're right now wondering, what should they do". This helped me develop discipline. Leadership and management require more discipline than we often give it the credit for.



In closing

Traditional business models in the automotive supplier market are facing unparalleled challenges. From profitability issues, the rise of technological advancements in particular GenAI, to changing consumer preferences, and the emergence of new competitors especially in the BEV value chain, suppliers are facing a complex landscape. And the stakes will become even higher, making reinvention inevitable.

How can suppliers and industrial companies overall ramp up their resiliency capabilities?

On a scale that measures the resiliency of core operations from 0-100, Industrials score 55. The number comes from a recent Accenture research report, which analyzes how geopolitical shifts, extreme weather events, technology breakthroughs and material and talent shortages affected companies' engineering, supply and production capabilities in 2021 and 2022.

This score of 55 certainly isn´t where I want to see the industry, and it´s clear that industrial companies must take action quickly and, to some extent, they already are.

While Industrials are currently lagging in regionalization, i.e. sourcing products from more regional suppliers and manufacturing them in the region where they sell them, they aim to reach 66% and 84% respectively by 2026 (vs. 24% today), according to our research. When it comes to visibility and predictability, only 8% of industrial organizations are alerted in near-real time during disruptive events hitting their supply chains. Data-driven solutions such as end-to-end control towers can provide scenario analysis and help detect and correct operational risks. Industrials' ultimate goal in this context should be reconfigurable supply chain networks and autonomous production, so companies can dynamically change operations at a site or shift from one site to another to maintain production when faced with unforeseen events and volatility.

But resiliency isn't just a matter of agile supply and production; it's also about getting products right from the start. Digital twins and simulations are vital enablers of the so-called shift-left engineering approach, a proven method wherein companies move activities to earlier in the development process to assess the potential impacts of disruption on the product at the time of design and reduce lead times. Building a digitally literate, multi-skilled workforce is equally important. What technicians, line managers and other workers do or don't do at the front lines of operations can make all the difference. They need access to predictive and data-driven tools, and more than that, they need the skills to work with them effectively. That means the obligation lies with the company´s leadership to help their people acquire these skills as AI/GenAI and other digital technologies are redesigning the (future) industrial workforce.

The insights shared by Goodyear´s Chris Helsel in this edition of The Industrialist underpin just that. Chris clearly articulates how the company tackles the ubiquitous manufacturing challenges with automation and digital technologies such as generative AI – including upskilling their workforce and pushing decision rights to the right place in the organization to speed up decision-making and be more responsive. It becomes clear, that approaches that served automotive suppliers well in the past are going to fall short in the coming period of disruption. Suppliers and industrial companies overall must reassess their business models, address financial challenges head-on, and leverage the power of artificial intelligence and GenAI to stay ahead of the curve. The need for swift adaptation and ramping up ones resiliency capabilities is non-negotiable and an imperative for future success.

Best Regards,

Thomas Rinn
Senior Managing Director,
Global Industrial Lead, Accenture

About The Industrialist

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