

Digital transformation in the automotive industry

A roadmap
to resilience,
growth, and
sustainable
mobility

ust.com



■ U
S T

Table of contents

• Introduction	1
• Chapter 1 - “Hazard ahead!”	2
1. Tightening economic conditions	2
2. Evolving technology and shifting customer expectations	2
3. Ongoing supply chain issues	3
4. Challenging labor and talent acquisition	3
5. “You are still on the best route”	3
• Chapter 2 - “Calculating an alternative route ...”	4
1. Mapping the value chain and value streams	4
2. Navigating increasingly complex supply chains	5
• Chapter 3 - “Your destination is straight ahead”	6
1. Illuminating the path with data	7
2. Riding the AI wave	7
3. Streamlining processes with intelligent automation	8
4. Locking out attackers with cybersecurity	8
• The final word	12

Introduction

Rewriting the map

The last few years have seen tremendous change and disruptions reshape the global business landscape. And the automotive industry is at the epicenter.

While 2020 and 2021 will always be remembered for lockdowns, rapid shifts in how we work, and supply chain issues, 2022 and 2023 will be remembered for rapid inflation, rising interest rates, and more supply chain issues. And then there's political instability, war, and natural disaster, all of which have impacted local and global markets.

But many obstacles and challenges currently facing your organization are also opportunities for transformation and growth.

A new world of mobility and smart manufacturing is emerging from the rubble — driven by urbanization, evolving consumer expectations, and the continuing sophistication of digital technologies.

To succeed in this new world, automakers must undertake rapid change. If your business is to withstand whatever disruptions the future may bring, you must develop new ways of working, create new sources of value, and become far more resilient.

Forget the five-year plan. The landscape is changing too rapidly for the usual long-term incremental approach, patching and shoring up the same old ways of doing things. The automotive industry needs to undergo the necessary transformation at an unprecedented speed. And that calls for an Agile, adaptive mindset, capable of innovating quickly and decisively whenever the ground shifts.

Rapid transformation is achievable. But to plan your journey, you first need a map, which is where this e-book comes in.

Of course, there is no single route to a successful transformation. Instead, this e-book is your guide to digital transformation within the automotive industry, intended to focus your thinking and inspire your ambition as you chart your path toward resilience, growth, and sustainable mobility.

The following few pages explore the challenges and opportunities that lie ahead before revealing how AI (Artificial Intelligence) and intelligent automation is revolutionizing the industry, transforming everything from production and quality control to demand forecasting and logistics.

Your organization's journey to a resilient and competitive future begins here.



CHAPTER 1

“Hazard ahead!”

The challenges facing the automotive industry

The journey to an effective solution begins with a thorough understanding of the problem. Unfortunately, there is not just one clearly defined problem but a series of interconnected issues.

Automakers can adapt and find new ways to detour around disruption by understanding the pain points and building new capabilities.

Tightening economic conditions

The world economy is currently locked in an inflationary cycle.

Rising inflation translates into increasing input costs, forcing manufacturers to pay more for raw materials and putting upward pressure on car prices.

But rising inflation also translates into rising interest rates, constraining capital.

As a result, automakers see profit margins squeezed, revenue growth stunted, and investments restricted.

Automakers are not the only ones feeling the pain. The double whammy of escalating prices and interest rates is also squeezing some consumers out of the market.¹

While car prices are not expected to fall for a while, demand remains high because the available inventory has not fully recovered from the shutdowns and disruptions during the pandemic. But this could change.

With inflation still rising (albeit slower), the looming specter of recession remains on the horizon. Demand may shrink as consumers think twice about purchasing big ticket items with big monthly repayments – just as supply and inventory improve.

Evolving technology and shifting customer expectations

Customer expectations have always shifted with the times. But the pace of these changes has never been faster, pushed by frequent technological advances and evolving lifestyle choices. Consequently, the industry is swiftly moving towards developing and adopting connected, autonomous, shared, and electric (CASE) technologies, particularly on electric vehicles (EVs).

However, this fast transition presents its challenges, including security concerns associated with connected vehicles and the need to reimagine the customer experience in a digitally connected world.

Meanwhile, the escalating need for microchips has exacerbated another common headache for automakers ...

¹ <https://www.cnbc.com/2023/06/01/how-inflation-and-higher-interest-rates-changed-car-buying.html>

Ongoing supply chain issues

The shift towards CASE technologies exposed automakers to even more supply chain pain as the pandemic lockdowns led to a global microchip shortage. In 2022, there were multiple reports of some tech companies and car manufacturers even buying up washing machines to strip out the microchips for use in their products.² The automotive industry struggles with stubborn supply chain issues, primarily due to global trade disruptions and supply chain bottlenecks. Unpredictable fuel and commodity pricing also add to the uncertainty, forcing businesses to revisit and adapt their strategies continually.

Most Original Equipment Manufacturers (OEMs) and suppliers are now better prepared, having adopted strategies to ensure their top and bottom lines remain healthy, even in the face of adversity. But the pandemic lockdowns and subsequent shortages are stark reminders of the importance of building resilience into your supply chains, operations, and business models.

Challenging labor and talent acquisition

In every industry, the demand for skilled talent in emerging technologies is incredibly high, driving up labor costs and further impacting the bottom line. And the automotive industry is no different, particularly with the shift toward CASE technologies.

Fierce competition for a small pool of professionals also means there is no guarantee your organization can acquire the necessary skillsets when you need them most – creating an additional hurdle to overcome and putting the optimum pace of your operations at risk.

“You are still on the best route”

While these are considerable challenges for the automotive industry, the future remains strong with massive opportunities for growth – including the accelerated transition to electric vehicles and the construction of a coast-to-coast EV-charging network.

CHAPTER 2

“Calculating an alternative route ...”

Decoding the automotive value chain

Before you can chart your transformation journey, you need to know where you are right now — and that requires a comprehensive understanding of how your business generates value.

There is an old joke about a tourist pulling over in their car to ask a local for directions. “Well sir, if I were you, I wouldn’t start from here.”

When undertaking a digital transformation, most organizations will hope to achieve the same or similar broad goals: efficiency, resilience, cost take-out, and so on. But as with planning any journey, your current location is as important as your destination. Where you are will dictate how you get there.

The details of your business's current operations will inform your best route to a successful transformation.

Mapping the value chain and value streams

Think of business value in terms of customer value. Everything your business does is about making that transfer of value happen most effectively.

A **value chain** provides a macro view of how your business generates economic value (i.e., revenue) by dividing the key functionalities within the business into primary and support activities. Primary activities might include conceptualization, design, production, and distribution, while secondary activities might include procurement, human resources, and infrastructure management.

Each of these activities may face independent challenges that can be addressed to reduce waste and improve cost efficiency.

Value streams document and decode the complex web of interconnected activities and capabilities required for information and materials to flow through the business and deliver a service or product to the customer. This end-to-end roadmap helps to identify those activities or processes that represent effort and/or cost to the business but generate little, if any, value to the customer. In short, waste. Value stream analysis is extremely useful when diagnosing the root cause(s) of delays and other inefficiencies. It also makes it easier to prioritize work according to the value it delivers to the customer.

Your value chain and value streams will reveal where gains can be made, informing the various projects to be undertaken as part of your digital transformation.

What impact might regulatory pressures have on your value chain? How might you rethink or optimize your value streams to keep up with changing customer expectations?

UST's value chain framework: Your transformation compass

UST's end-to-end value chain framework will keep your transformation headed in the right direction by strengthening your business in three key areas:

Agility: UST's framework supports an Agile culture, so your organization can innovate, adapt, and deliver change swiftly to mitigate potential threats and seize emerging opportunities.

Flexibility: A flexible value chain can maintain operations under any conditions. UST's digital solutions create resilient, adaptable processes, helping businesses stay productive in the face of disruption.

Cost efficiency: As operational costs rise and margins narrow, cost-efficient strategies are the key to staying competitive. Our framework provides insights to optimize costs throughout your business without compromising quality or customer satisfaction.

Navigating increasingly complex supply chains

Consider the challenge of managing a global network of suppliers. Balancing these relationships and ensuring each collaboration operates efficiently is a formidable task.

For example, it is not uncommon for an automotive manufacturer to source components from multiple suppliers across multiple continents — each a different size, with its specialization, and operating within its local regulatory framework. And that is before you factor in the cultural nuances, regional disruptions, and logistical intricacies.

It is up to the manufacturer to navigate these factors, including the various compliance requirements, on top of the specific details underpinning each relationship. Automakers must master all these complexities to protect its supply chains and maintain seamless operations.

But there is yet another layer of complexity. Changing customer expectations, driven by technological advancements and evolving preferences, demand rapid adaptation and customization. You do not only have to manage today's supplier relationships. It would be best if you also were prepared to update and evolve those relationships or add new ones quickly.

Your organization can take control of these complexities with a well-executed supplier management portal. As with value chains and value streams, you can then analyze and decode your supply chains to identify opportunities to reduce waste, increase efficiency, measure and improve sustainability, and strengthen relationships.

This information can also reveal otherwise hidden pain points, allowing you to optimize the experience of working with your business for your most valued suppliers. Creating a smoother experience for your suppliers might translate into lower costs for you.

CHAPTER 3

“Your destination is straight ahead”

Navigating a successful digital transformation

Embracing the power of digital technologies is the key to transformative change in the automotive industry. Let us explore some tech enabling businesses to unlock new efficiency, innovation, and resilience levels.

With a thorough understanding of how your business generates value, you can begin looking for opportunities to optimize and transform your operations.

The goal is to seamlessly integrate digital technologies into your physical operations across the entire value chain – from product development to manufacturing, supply chain management to sales and service.

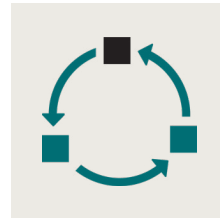
Consider the benefits of just the following two examples:



Design and prototyping

Reduce the time and cost associated with physical prototyping by adopting computer-aided design (CAD) software and virtual simulations.

- Enhances collaboration.
- Accelerates innovation.
- Facilitates the development of more advanced and reliable products.



Supply chain management

Seamlessly coordinate and optimize your supply chain activities with advanced analytics, IoT (Internet of Things) sensors, and blockchain solutions.

- Provides real-time visibility into inventory levels.
- Streamlines logistics operations.
- Enables effective demand forecasting, advanced and reliable products.

But digital transformation is about more than streamlining your operations to drive efficiency. It is about fostering a culture of innovation and growth by embracing emergent technologies such as AI, machine learning, and automation. It is about completely rethinking how your business functions to enhance customer experiences, unlock new business opportunities, and generate more value.

Illuminating the path with data

The tools to collect, process and analyze large quantities of data have improved massively over time, making the world increasingly data-driven.

By harnessing the power of data, automakers can illuminate the road ahead in an ever-changing business landscape. Integrating digital tools into all your physical operations and processes can give you complete end-to-end visibility of your value chain, equipping you with the analytics and insights to anticipate disruptions, identify potential impacts, diagnose causes, make data-driven decisions, and adapt quickly. Resilience.

A truly data-led approach can be deeply transformative by helping your business become more proactive and less reactive, setting the stage for a more innovative, more resilient automotive industry.

Riding the AI wave

Artificial Intelligence (AI) stands at the forefront of this digital revolution, offering numerous solutions to the industry's enduring challenges. Generative AI, in particular can assist you in designing, testing, and refining automotive parts faster, creating opportunities for innovation and cost savings.

Quality control

AI-powered quality control systems can significantly reduce defects and speed up production. Computer vision combined with machine learning algorithms accurately identifies anomalies, allowing you to correct or discard defective components before they reach the market — helping to reduce wastage, optimize costs, and boost customer satisfaction.

Logistics management

AI significantly improves logistics by optimizing schedules and maintaining ideal inventory levels. Instead of losing shelf space to just-in-case (JIC) inventory, AI supports a just-in-time (JIT) strategy, improving cash flow while reducing costs. Greater certainty around stock levels also means fewer interruptions to operations due to delayed or unavailable components, reducing the risk of customer disappointment.

Demand forecasting

AI can be particularly useful for supply chain planning by accurately predicting future trends. With more data continually enriching the AI model over time, its understanding of market dynamics deepens, improving the accuracy and utility of its demand forecasting and empowering you further to fine-tune the efficiency and profitability of your operations.

Production efficiency

AI does not just transform processes — it transforms the workforce. AI-powered robots, or collaborative robots, can build processors and other automobile parts faster and more accurately. Working in tandem with humans, robots can boost productivity, enhance quality, and reduce workplace injuries.

Streamlining processes with intelligent automation

Many repeatable and often mundane tasks chew up employee time and effort – and hence cost – when they can easily be automated.

Intelligent automation (IA) presents further opportunities for transformation. Robotic Process Automation (RPA) can streamline repetitive, rule-based tasks, improving accuracy and efficiency while freeing up employees for more productive work.

Procurement teams, for instance, can use RPA to monitor inventory levels and automatically initiate purchase orders when supplies dip below a specified threshold.

However, a word of caution: Automate a bad process, and all you have done is make a bad process faster.

Before replacing a specific process or task with RPA, consider how it functions within the broader value stream. Will this task still be relevant once other processes have been automated or streamlined? Could the value stream be optimized further by merging some tasks into a single automated process?

Locking out attackers with cybersecurity

As vehicles become more connected, cybersecurity becomes increasingly critical.

Investing in robust security measures isn't just about protecting sensitive data to comply with regulatory standards. With major security breaches making the headlines almost every week, cybersecurity is also about maintaining customer trust.

Cybersecurity must be baked into every stage of your transformation journey to ensure that your newly integrated technologies do not introduce new vulnerabilities for bad actors to exploit.

But the work continues beyond there. Cybersecurity is a constantly evolving challenge to stay one step ahead of the attackers. Hence why, many larger enterprises partner with a cybersecurity provider to supplement their internal security efforts with ongoing, often AI-driven, managed detection and response services.



The final word

The road before you may seem long and winding, beset with unprecedented challenges. The automotive industry is undeniably experiencing an era of profound change.

However, the sheer power of digital technology means this is also an era of boundless opportunity, unlocking new capabilities, accelerating innovation, and reimagining business value creation.

And then there's AI, which provides you with an accurate turn-by-turn navigation system, continually checking for hazards on the road ahead and recalculating how to keep you on the best possible route toward a sustainable, resilient future.

Ready to explore the future of your automotive business?

UST's automotive industry consulting services and solutions can help you map your ideal route to a successful digital transformation.

Find out more



Together, we build
for boundless
impact

ust.com

© 2023 UST Global Inc.

**U ■
S T**