many factors contribute to a product’s success — engineering innovation, product quality and the business model employed are all important. But in nearly every industry, time to market is among the most critical factors. Released at the right time, your product grabs market share and dominates the field. Miss the window of opportunity, whether as the innovation leader or rapid follower, and your product will struggle. Globally competitive markets, along with increasingly volatile consumer demands, drive companies to further reduce their time to market.

One of the greatest bottlenecks in the product development process is physical testing and verification. The old practice of developing a design, building a physical prototype, testing, redesigning, and then building a new prototype is no longer sustainable. This is especially true as product architectures become more complex by using mechanical, electrical and embedded software subsystems. Manufacturers need to know not only how individual subsystems will perform, but how the complete product will perform in the real world — long before physical verification.

Engineering simulation and virtual prototyping have reduced reliance on physical testing and pushed verification activities earlier in the design. Engineers using these tools assess designs more comprehensively and at a fraction of the time and cost. Simulation will never fully replace physical testing, but companies use it widely to reduce the number of physical prototypes and testing cycles at the component and subsystem levels, shaving months off development lead times.

However, the demand for shorter time to market is relentless. In the automotive industry, average lead times have been reduced from over four years to two and a half. Yet the industry is driving to push this below two years, despite the dramatic increase in product complexity. And it’s not just the auto industry. The trend holds for almost every industry — high-tech, aerospace, industrial equipment, consumer products — you name it. Simply applying simulation to verify design and reduce physical testing is not sufficient; simulation has to be applied efficiently throughout the design cycle to compress every aspect of the product development cycle.

At ANSYS, we think about process compression along three different axes: compressing each design phase, eliminating extra design cycles, and parallelizing engineering activities. To compress each design cycle, we enable our customers to create custom, repeatable simulation workflows that are deployed to engineers and designers so they can make the best decisions earlier. To reduce design iterations, our customers leverage the ANSYS engineering simulation platform to execute multi-objective optimization and find the best design faster. And to parallelize design activities, we have invested in model-based systems engineering tools to better manage and communicate the complexities of today’s product architectures using living, executable models — rather than static CAD models, documents or spreadsheets. These models provide a thorough understanding of the dependencies, data and interfaces between subsystems so engineering teams break linear, waterfall development processes and adopt concurrent engineering practices.

To meet tomorrow’s time-to-market goals, more strategic deployments of simulation focus on compressing, eliminating and parallelizing. As industry leaders redefine their best practices, they’re incorporating the ANSYS simulation platform as a cornerstone of their strategy for success.