# Club Car Democratizes Simulation

## Club Car Prioritizes Simulation Driven Design with Creo

### Challenges:

With an increase in consumer demands, Club Car sought ways to streamline their simulation process to create optimized and durable products quickly and efficiently.

### Results:

Through the power of Creo Simulation Live, Club Car was able to equip their design engineers with the tools needed to conduct quick simulation requests. As a result, Club Car cut months out of the design process and a faster time-to-market was achieved.

### Products Used:

Creo, Creo Simulation Live

## Club Car Drives Exceptional Experiences

For over 60 years, Club Car, a leader in small task-orientated vehicles, has been delivering and driving exceptional experiences through their products. Club Car focuses on multiple markets including golf, utility, and the consumer market.

Golf has been a popular outdoor activity for people who enjoy an active lifestyle. When the COVID-19 pandemic hit, its popularity grew. With golf being one of the only recreational activities to do safely and at a social distance, demand increased for golf accessories—like the golf car. To respond to customers' interest in new and enhanced products, Club Car always looks for innovative ways to address these shifting markets quickly and efficiently.

## Shifting Simulation To The Left

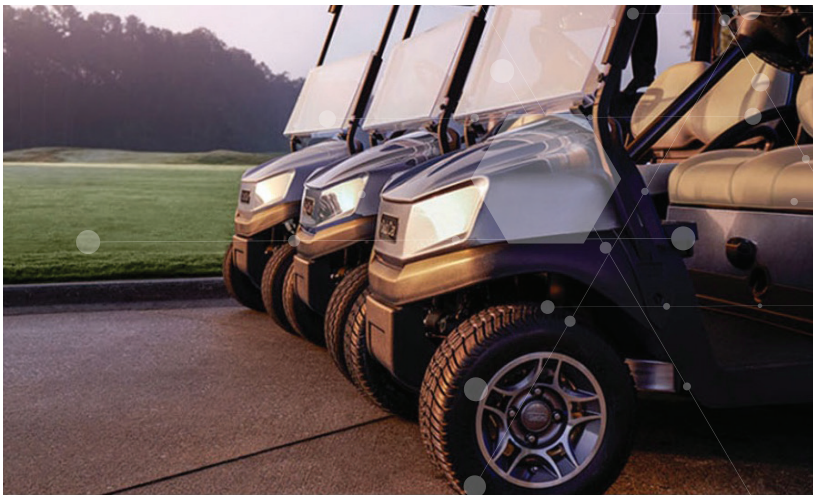
At Club Car, design engineers and analysts traditionally interface through explicit simulation requests. The design engineers initiate the request, and the analysts execute the request. This process is typically reserved for high-fidelity simulations, and designers and analysts are required to export data in various formats to communicate the results. However, not all simulations need to be performed at this level of fidelity. This is where the opportunity to democratize simulation is realized.

Design engineers, who are involved in structural design and analysis, are mostly creating many dimensional and material property variations and looking at stresses and deflections to create the most optimal, robust and durable product designs.

> **The reason we perform simulations is to learn more about our products. By enabling more of our staff to participate in simulations, we're learning at a faster rate than ever before.**
>
> **Steven Huston, Principal Engineer, Club Car**

Implementing Creo Simulation Live (CSL) revolutionized the way that quick simulation needs are handled. The design engineers benefit from having direct access to capabilities to do some of the early-stage design simulations on their own. Instead of going through the transactional process of saving work, archiving it, transferring it to the simulation department, and waiting for results, design engineers can conduct simulations quickly, easily, and intuitively in Creo. This removes light-weight work from the analysts and allows them to focus on critical high-fidelity analyses.

Traditionally, there is natural hesitation for leadership to allow people that do not have the prerequisite training in structural mechanical analysis to have a tool set like CSL. Specific limitations are set around the tool set to prevent costly errors and strains on resources. If the project is something of more consequence, like a high investment in tooling, critical failure modes, late-stage design or work being documented through an FMEA process or a detailed verification plan, then the expectation is that the simulation request needs to be handled by trained analysts.



For Club Car, early-stage simulation practices were built into the Technical Design Review (TDR) process. For one project, the Club Car team started the concept design activity by creating physical mockups to define the simulation parameters and tasks early in the TDR process. By doing early-design iterations using physical mock-ups combined with rapid simulations, evaluating the data, and refining the design quickly, months were saved in the design process (even before the gated design process was officially kicked off). Not only does this decrease project risk and costly physical prototypes, but it also helps create a more optimized part or product quicker.

In addition, the use of CSL has also helped reinforce engineering principles. For example, if there is an application to reduce material and deflection results are important, specific information about the material properties is required. When the design group participates in the simulation analysis, this serves as another checkpoint for better collaboration and understanding of the critical parameters that need to be thought out in the design evolution of the product. By democratizing simulation with CSL, design engineers tend to have a more thought out and complete design.

## Conclusion

For Club Car, success is seen as a state where design engineers can answer analysis questions on their own within the established limits. By running simulation early in the design process, the amount of rework is reduced, the designs reaching the simulation team are more robust and the need to do physical, time-consuming, and expensive tests is decreased. By leveraging simulation driven-design practices using CSL, Club Car delivers their products efficiently and in the most optimized way possible.



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