

Rochester Area Consulting Engineers (R.A.C.E.)

PORTABLE INNOVATIONS IN DRAMATIC FASHION



Support and software from Symmetry Solutions helps RACE mobilize projects



A multi-disciplinary virtual project team, Rochester Area Consulting Engineers applies advanced skills and deep experience to a full range of engineering product development which require the application of electronic, mechanical, optical, or industrial design. Founded in 1993, RACE operates out of Rochester, Minnesota. For more information, please visit: www.raceminn.com.

A virtual project team is like a typical engineering department, only portable. Instead of residing in office cubes, the team members work out of their homes and meet up with each other at different sites and on the Internet as they move from project to project.

One of the most accomplished virtual product teams in Minnesota is Rochester Area Consulting Engineers (RACE), a group of part-time product-development professionals, whose skills vary from mechanical and electrical engineering to optics and industrial design. Many team members within RACE are veterans with long product development careers in big companies, collectively holding 59 patents.

"We have about 20 people; some of them are retired and some are working for other companies," explains mechanical engineer and principal Bill Brooks, who founded RACE 15-years ago. "In 1993, there was a 2,400-employee layoff at IBM and a lot of engineers and technicians were included. I thought it would be a good idea to try enlisting some of these people to keep their key skills in Rochester."

Brooks sees two important distinctions between managing a virtual project team, and managing in the typical engineering workplace. "Communications and coordination between people in the same facility are always a challenge. Working as a virtual project team is even more challenging to keep everyone in sync," he says. "However, using frequent Internet and face-to-face meetings solves most communications and coordination problems with team members. That's the unique part of RACE projects."

Secondly, the subject matter keeps changing as the consultants move from job to job. This brings them into contact with engineering problems they may never have encountered before. RACE engineers often have to rise to the occasion. "Each group member works as an independent consultant and the projects they elect to take on are voluntary, so their participation is encouraged by having interesting, challenging work for them to perform. Other team members can and do pitch in to help improve everyone's skills in solving the really tough problems. The customer's needs are satisfied and the team capabilities are continuously improving. The more challenging the work, the better."

RACE is set up with tools and services that assist the consultants in terms of sharing workflow and tackling new, unfamiliar situations. For all mechanical work, the team relies on SolidWorks as a common design tool, a program which Brooks describes as "the most convenient and friendliest to the engineer" of all modelers on the market. Rather than sharing models through an in-office server, RACE engineers trade lightweight 3D models through email with eDrawings - a FREE module offered by SolidWorks. Brooks said, "eDrawings are definitely a big part of our communication efficiency. We can also send eDrawings of the assemblies we make to the customer. Anybody can open the files whether or not they have a CAD system installed."

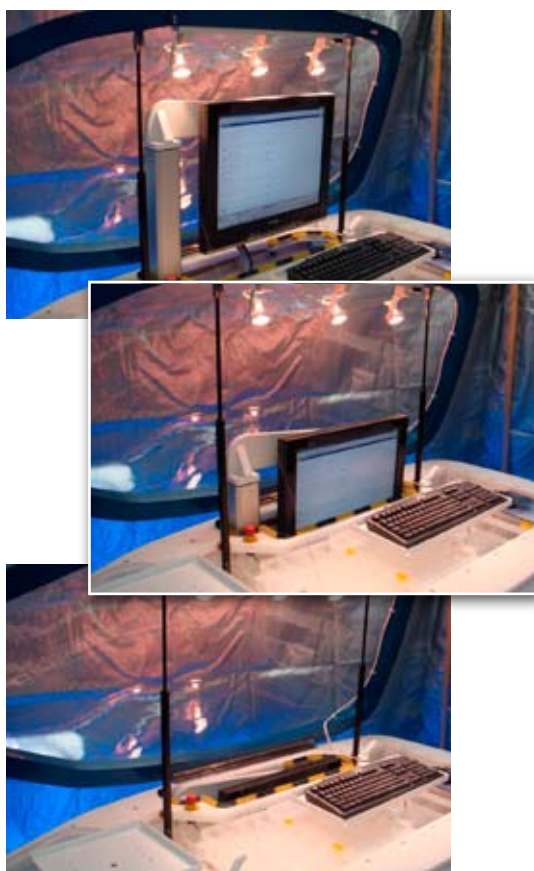


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“Symmetry Solutions has a great and very helpful staff of experts to assist with any challenge.... A quick call to the Symmetry Solutions technical staff will usually answer my complex design question. If they do not have the answer, they will research it and get back to me.”

Bill Brooks, Company Founder and Mechanical Engineer
R.A.C.E.



When unusual modeling challenges come their way, RACE calls on the expert support from Symmetry Solutions, Minnesota’s premier SolidWorks reseller. The team at Symmetry Solutions not only sets up RACE professionals with SolidWorks software and training, but they also are always available to lend a bit of advice.

“Symmetry Solutions has a great and very helpful staff of experts to assist with any challenge,” says Brooks. “I could spend a couple hours going through the instruction books or I could beat my head against the wall, but that’s really pointless. A quick call to the Symmetry Solutions technical staff will usually answer my complex design question. If they do not have the answer, they will research it and get back to me.”

The Mayo Innovation Cart

An example of unusual modeling challenges for RACE - and another instance of portability - comes from Rochester’s famed Mayo Clinic. The Innovation Team at Mayo is tasked with giving one-day crash courses to teach doctors and researchers how to correctly record and file intellectual property for new medical inventions. Just as RACE does not have a central office, the Innovation Team at Mayo does not have a dedicated classroom. The instructors go on-location to the researcher’s workplace, whether on Mayo’s sprawling Rochester complex, or to branch medical centers around the country.

“Once they started doing the training, the team realized that they had a lot of materials to bring to the class,” explains Brooks. “They needed all the requisite IP forms and books, but they also needed a projector, a computer linked to the hospital’s databases, a printer, digital voice recorders, cameras and so on.”

The idea was to create a self-contained educational cart. Therefore, the Innovation Team contacted RACE, which had provided outsourced help to Mayo in the past.

What made the Mayo Innovations Cart unusual was the fact that the instructors wanted more than strict functionality. As every teacher knows, getting students’ attention takes a bit of showmanship. With ‘Innovation’ being the topic of the class, the team needed an eye-catcher. With a dramatic entrance, the cart would garner the students’ attention. Instructors would let the multi-purpose vehicle be a topic starter but also have functionality by playing a different role at each stage of the day’s agenda.

“With a name like ‘the Innovation Team’, you know they’re going to give you a whole lot of ideas,” laughs Brooks. “Their intention was to make people think about innovations, and they didn’t want them thinking about their regular lab work or the normal daily routine. Therefore, they didn’t want this cart to look like any of the typical medical carts you see in the halls of the Mayo Clinic. That meant no stainless steel, which is used extensively throughout the facility. They didn’t want any right angles or straight lines in the design. They wanted every piece to have a sculpted look.”

The list of design requirements for RACE was extensive, including some wildly unusual requests, like a clear domed top that resembled a P51 Mustang canopy, specially carved foam shelves to hold each digital device individually, and exterior panels backlit with blue LEDs. The cart even sports an electrically cooled compartment to hold cold soft drinks for the class.

“They wanted the cart to be unique. They wanted custom drawers, rather than buying some drawers and adapting them to fit,” says Brooks. The RACE team had to devise complex custom tooling for many of the parts, including four curved vacuum-formed tools that Brooks describes.

“We had to use all the power of SolidWorks to sculpt these parts,” admits Brooks, “and to have all the pieces fit together.” Whether it was modeling the fully sculpted canopy, fitting the LED connections to the body, or devising machined gas springs to attach perfectly with the aluminum rings around the structure, Brooks could always rely on the knowledge base of Symmetry Solutions to get through the problem. “There were a lot of challenging steps to the complex model project and the experts at Symmetry Solutions played a big role in assisting us when needed. They are absolutely worth the yearly renewal fee.”

Earlier this year, the RACE team delivered the first of a potential 16 carts to be used at Mayo-owned medical facilities across the country. “The cart was quite an extensive project. The Innovation Team at Mayo knew what they wanted and they liked what we gave them.”

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