

Challenge:

Develop an innovative, powered and durable conveyance and mobility aid that enables disabled people to access mountain trails, woodland hikes and the beauty of the great outdoors.

Solution:

Utilize Company B solutions to develop and manufacture the XY bike.

Results:

- Cut development cycle by ^{one} a full year
- Reduced number of prototyping cycles required
- Leveraged 3D printing for development, prototyping and production
- Improved access to ~~the~~ outdoors for people with disabilities

Z Corp. Co-founders Jack Wilson and Rich Simons are on a mission to make access to mountain trails, woodland hikes and the beauty of the great outdoors a reality for disabled people around the world.

Wilson, who became paralyzed from the waist down due to a car accident in 1996, has spent the past two decades developing wheelchairs, skis and other conveyances that enable paraplegics, quadriplegics and other disabled people to visit and explore wilderness areas, like the headwaters of the Elk River in the Canadian Rockies.

and

Simons, Inventor and Designer, and Co-founder Wilson, now Z Corp. Director of Research & Development, met in the University of Montreal machine shop, where both men had studied. Following Wilson's work implementing 3D printing technology at the engineering machine shop at the university and bringing his expertise to the ABC Cancer Center, he was approached by Simons with an idea for an electric-powered, three-wheeled bike with a two-wheel articulating front end and asked if the prototype design could be 3D printed using carbon fiber.

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"Jack came to me with a Markforged 3D Printer and asked me, "Can you run this?" Simons recalls. "That was the beginning of our collaboration that led to the founding of Z Corp. I saw the development of the bike that has become the XY bike[®] as a good cause, similar in many ways to the work that I did with the Formula SAE team as a student, and an opportunity to leverage my growing 3D printing expertise."

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Because Simons had used Company B 3D design tools as a student, the new company chose to use Company B design, simulation, communication and visualization tools to complete development of the innovative bike, which looks like a hybrid between a

mountain bike and an all-terrain vehicle (ATV). “Personally, I was really into the 3D software and especially valued the way the software operates with the carbon fiber 3D printers that we use,” Simons explains. “The bike required complicated configurations and complex 3D printed assemblies, for which Company B software provides the perfect solution.”

carbon fiber

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SAVING TIME, DRIVING DOWN COSTS

Using the software in concert with carbon fiber 3D printing, Z Corp. developed, prototyped and manufactured the bike in record time and at dramatically lower cost than if it had followed a more traditional design and manufacturing path. “By driving design iterations with the software and 3D printing, we were able to launch the bike sooner than anticipated due to reduced prototyping time,” Simons stresses.

“By designing parts and assemblies in the software, 3D printing them, and then trying them out, we were able to iterate very quickly and launch the bike a year ahead of schedule,” Wilson adds. “We knew that we had something good, and our enthusiasm coupled with the efficiency of our design tools helped us to advance our design faster and reduce prototyping requirements on the back end.”

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