

As published in...

DEVELOPMENT NEWS

Published by **TOLEDO BUSINESS JOURNAL**

toledobiz.com JAN 2009 Vol. 27. No. 1

UT engineering dept. conducts Core Trainer R&D

A few years ago, F. Alan Schultheis – president, CEO, and founder of Turning Point – recognized a need in the sport of golf. He observed several retired and middle-aged golf players experiencing loss of distance in their shots and soreness in their lower backs from playing.

It was then that Schultheis decided to pursue the research and development of a device that could make sophisticated, high-tech training techniques available to anyone. Because the core of one's body (from the knees to the shoulders) plays a key role in every physical activity, he came up with the idea for the Core Trainer.

Turning Point was formed in 2005 to develop Core Trainer, a golf, general exercise, and physical therapy / rehabilitation device. The original research and development for the device was conducted at the bioengineering department of the University of Toledo (UT) under the direction of Dr. Vijay Goel. Assisting Goel were Dr. Danny Pincivero, associate professor of kinesiology and director of the human performance and fatigue laboratory at UT; John Jeagly, laboratory supervisor, department of mechanical, industrial, and manufacturing engineering at UT; and David Dick, UT engineer.



Dave Stockton, Jr., former PGA touring pro, tests the Core Trainer

specific training, general exercise applications, and scientific confirmation of the equipment's benefits.

The Core Trainer provides variable resistance and allows a user to measure a range of motions. Additionally, it helps users learn to separate the movement of their pelvis from their shoulders. A computer inside the Core Trainer records data for each user, including the amount of time one movement takes and how one day's workout compares to that of a previous day.

There are two versions of the Core Trainer: professional and consumer. According to Schultheis, the cost for the devices is loosely estimated to be \$10,000 and \$600, respectively.

"The version that we have now is what we call the professional version," Schultheis explained. "It would be the one used by golf trainers and academies, trainers at universities, pro trainers, and high schools that can afford it. That version captures more data. It's built to stronger standards [than the consumer version] because it's going to get much more use. The next step will be an at home version. Not all of us can go to health clubs three times a week, but we want to do this kind of [training]."

According to Schultheis, one of the things that makes the Core Trainer unique is that it's one of very few sport specific pieces of training equipment. Most devices train specific muscles, but the Core Trainer is designed to engage many muscles at one time. It was initially designed with golf in mind, but it can be used to train for any sport that requires rotating the body or the separation of the upper and lower body, including baseball, tennis, soccer, dancing, and ice skating.

Turning Point is currently exploring the insertion of a force plate into the Core Trainer to see how weight is shifting during exercise, a process that can help in rehabilitation and physical therapy. Additionally, the company is testing different data and technology for use in a range of applications.

An advisory board has been established to challenge the development to date, evaluate the test results, and help direct the final refinement of the product's design, specifications, and protocols. These efforts will be completed in the first half of the year.

Schultheis expects the professional Core Trainer to be available for purchase by the middle of the year and the consumer version to be available by the fourth quarter. Turning Point plans to sell the devices directly to the professional market and, ideally, leverage those relationships to sell to the consumer.

TECHNOLOGY COMMERCIALIZATION

"Schultheis...came to us a couple years ago and was looking for someone to help him design a machine to help train golfers," Goel explained. "He himself is a golfer and loves playing golf. When he was in Florida, he saw that golfers have the time and resources [to play] but they don't have the stamina. So he wanted to design something, and we accepted the challenge."

UT developed a biomechanical design and, with the assistance of an engineering and manufacturing company, a fully-functioning electronically-controlled prototype was produced.

Testing by UT's kinesiology department using electromyography (EMG) demonstrated that the equipment caused the targeted muscles (including quadriceps, upper and lower abdominals, gluts, and upper and lower back) to work in the desired fashion. This prototype was then further refined by the engineering and design staff of Hoggan Health Industries, resulting in the market-ready Core Trainer professional version that is being further tested by independent universities, clinics, and for-profit companies.

"I created a joint venture with Hoggan Health Industries...that could take what was done and basically keep the essence of it but push it a little further," Schultheis stated. "We have manufactured 12 [Core Trainers] and they are in testing at a number of different universities and training facilities. One is also at Cleveland Clinic right now..."

"We were probably 95% sure we had the [device] put together well and it was functioning properly. But we needed average citizens to use it and get experience on it as well as start to quantify...that it is helping people in their golf swing."

The Cleveland Clinic is currently evaluating the Core Trainer for use in physical therapy and rehabilitation while UT, The University of Utah, and Averett University are each conducting testing of the Core Trainer for sport



(L) Vijay K. Goel, Ph.D. and (R) F. Alan Schultheis