



Nonprofit Organization Showcases Popular Event with Global Positioning System Solution

Overview

Country or Region: United States

Industry: Nonprofit

Customer Profile

Based in Richmond, Virginia, Richmond Sports Backers is a nonprofit organization that sponsors more than 25 amateur sporting events each year and employs 11.

Business Situation

To enhance fan interest in one of its major footrace events, Richmond Sports Backers wanted to display a course map showing runners' progress during the first-ever television broadcast of the race.

Solution

A global positioning system (GPS)-based solution was developed with the Microsoft® .NET Compact Framework and Microsoft Visual Studio® 2005 for mobile phones running Windows Mobile® 5.0 and connected to Bluetooth GPS devices.

Benefits

- Familiar, developer-friendly environment
- Full-featured toolset
- Flexibility for future implementations
- Flawless execution
- Excellent publicity

“Television time for any of our events—especially showcasing an intriguing solution like this one—helps all of our events in terms of participants, fans, and sponsors.”

Tracey Russell, Events Director, Richmond Sports Backers

Richmond Sports Backers is an award-winning nonprofit organization that organizes local sporting events for the benefit of the community. To further boost interest in its annual Ukrop's Monument Avenue 10K (10-kilometer) footrace, the organization wanted to show a map of the course and the progress of lead runners to fans watching the event on television. So, the organization enlisted Microsoft® Gold Certified Partner CapTech Ventures to develop a solution using mobile phones and global positioning system (GPS) technology to track selected runners on a televised course map. Working with the Microsoft .NET Compact Framework, Microsoft Visual Studio® 2005, and mobile phones running Windows Mobile® 5.0 and connected to Bluetooth GPS devices, CapTech Ventures delivered a full-featured solution that effectively showcased the footrace, Richmond Sports Backers, and its own technology expertise.



“You can imagine how the drama would intensify for viewers as they watched the lead runner gain on the Dash runner as they both approached the finish line.”

Scott Schricker, Marketing Director, Richmond Sports Backers

Situation

Richmond Sports Backers is devoted to the mission of stimulating the local Richmond, Virginia, economy and developing a better community through sports. The organization hosts events ranging from road races for amateur runners and cyclists to national championships for K-12 and university-level fencing, karate, volleyball, and soccer teams. It partners with other local-area organizations to host additional events and raises funds for equipment and facility updates of local sports centers.

Richmond Sports Backers also manages a local scholarship program that annually provides over U.S.\$30,000 to local-area student athletes. In a 2006 competition against similar organizations in 270 U.S. cities, Richmond Sports Backers was named Best Sports Commission in the country by the National Association of Sports Commissions.

One of the biggest events each year for Richmond Sports Backers is the Ukrop's Monument Avenue 10K, now the fourth-largest 10-kilometer footrace in the United States and featuring a popular attraction known as Cingular Dash for the Cash. In this contest, a randomly chosen local racer is given a head start—based on his or her known running skill—so as to be able to “compete” against the elite racers who typically hail from outside the United States.

The Dash for the Cash was wildly successful when Richmond Sports Backers introduced it in 2005. As the organization's executives prepared for the 2006 race, they decided to build on that success by making the “competition” more exciting for fans who wanted to follow the race on television or via the Web. The executives figured the best way to do this would be to show a map of the race course with two progress markers: one for the Dash for the Cash runner, and one for the

runner who was leading the main field. “You can imagine how the drama would intensify for viewers as they watched the lead runner gain on the Dash runner as they both approached the finish line,” says Scott Schricker, Marketing Director, Richmond Sports Backers.

As Schricker further explains, the 2006 event was the first in the event's history to be shown on a live television broadcast, so the idea of tracking key racers could be a major win for the station doing the broadcasting and Richmond Sports Backers alike.

But there was a catch. “The station did not have a helicopter for doing aerial video of the race course and runners,” Schricker says. “So the idea would have to be implemented through some sort of computerized display with electronic tracking of the runners.”

As it happened, one of the cosponsors of the race was CapTech Ventures, a local information-technology consulting firm whose executives were eager to showcase their company's expertise in delivering mobile solutions. As Senior Consultant Matthew Harvell explains, “We decided right away it was a solution we wanted to pursue, so we started out by looking at radio frequency identification (RFID), the technology most commonly used for digitally tracking foot racers. But we found out quickly that a global positioning system (GPS) would make more sense.”

A GPS-based solution—using mobile phones and GPS devices—seemed to promise a high degree of accuracy for a very reasonable cost. “We found, for example, that with error correction enabled, we could track the runners to an accuracy of nine feet—and for a total hardware cost of less than \$1,500,” Harvell says. “RFID hardware, by contrast, would have cost at least \$30,000.”

“We figured that because Windows Mobile 5.0 is available on a wide variety of mobile devices, developing for that operating system would give us the greatest choice of hardware.”

Matthew Harvell, Senior Consultant, CapTech Ventures

But there was another catch. “To our knowledge, no one had ever created a footrace-tracking system using GPS,” Harvell points out. “So our idea was greeted with some skepticism in the vendor community.”

Fortunately, however, the people at Richmond Sports Backers were not among them. “They tended to be ahead of the curve in technology themselves, as the first organization in this area to adopt chip-timing for footraces,” he adds. “So they were all in favor of a GPS-based solution.”

Solution

For the software foundation of the solution, Harvell and his colleagues turned immediately to Windows Mobile® 5.0 software, the Microsoft® .NET Compact Framework, and the Microsoft Visual Studio® 2005 development system.

They based their decision on two criteria. One, as a Microsoft Gold Certified Partner, CapTech Ventures had extensive experience working with Microsoft mobile tools and platforms, including the Microsoft Windows® CE operating system, Pocket PCs, Windows XP Tablet PC Edition, and, most recently, Windows Mobile 5.0 and the .NET Compact Framework.

Two, as Harvell emphasizes, there were significant hardware advantages of working with the Microsoft technologies. “We figured that because Windows Mobile 5.0 is available on a wide variety of mobile devices, developing for that operating system would give us the greatest choice of hardware,” he says. “By extension, the .NET Compact Framework would give us the greatest control over how to make the hardware work for the solution.”

Yet another advantage of using a Microsoft environment for the Dash for the Cash

solution, says Lead Project Developer Philip Kedy, was that environment’s familiarity to CapTech Ventures developers. As a race sponsor, CapTech Ventures donated its labor, which meant that developers were working on the project nights and weekends, in addition to their regular paid work. “Under these conditions, having a development environment that I already knew well was absolutely essential for getting the job done,” Kedy says.

Between early January and late March of 2006, Kedy and Harvell spent a total of roughly 150 hours bringing the project from initial design to production deployment. Two-thirds of that time was spent on GPS and communication components and the rest on display and graphics.

The solution CapTech Ventures delivered consisted of the following:

Mobile client application. This application, written in the Microsoft Visual C#® development tool and based on the .NET Compact Framework, ran on a mobile phone powered by Windows Mobile 5.0. One phone and one Bluetooth GPS device resided in each of two vehicles: one traveling alongside the Dash runner, and one traveling alongside the runner leading the main field. Over a serial connection, the application pulled longitude and latitude values from the GPS devices and forwarded these values over an Evolution-Data Optimized network to a central server where position data was maintained for continuous updating of the race-course display.

Desktop client application. This application, also written in Visual C#, used Secure Sockets Layer to access the position data on the server and used XML to marshal and serialize the data. The application was installed on two PCs: a high-end PC running

“In the .NET Compact Framework, a built-in serial-port object simplifies monitoring and configuring the port and sending and receiving the data.”

Philip Kedy, Lead Project Developer, CapTech Ventures

Windows XP and the .NET Framework 2.0 for creating the course-map display on the television broadcast (using Windows Forms with GDI+ wrappers and custom image-scaling routines), and an ordinary desktop PC running Windows XP for creating the course-map display on a Web site (using a Web browser and scalable vector graphics).

Web application. This application, including a Web service and an XML-based GPS location service, was also written in Visual C# and ran on the central server. The server was running the Windows Server® 2003 operating system, Microsoft SQL Server™ 2005, and the .NET Framework 2.0. The Web application called SQL Stored Procedures to query and update the device coordinates for use by the mobile GPS client and TV graphical display.

Benefits

Harvell, Kedy, and their colleagues at CapTech Ventures were pleased with the benefits resulting from their decision to use Microsoft mobile technologies for developing and deploying the Dash for the Cash solution. Those benefits include the ease of development in a familiar and well-documented development environment and the capabilities developers were able to incorporate into the solution from the rich feature set available in that environment.

Another benefit to CapTech Ventures was the publicity generated by having the solution featured on a local television broadcast (and a webcast) of the Ukrop's Monument Avenue 10K footrace. That broadcast provided favorable publicity for Richmond Sports Backers as well.

Development Environment Conducive to Productivity

Kedy speaks highly of the ease of design, coding, testing, and debugging that he found in Visual Studio 2005 and the .NET Compact

Framework. One important factor was the widely available documentation for those technologies. “There is a huge array of documentation out there explaining how to write mobile applications, particularly Windows Forms applications, with Visual Studio 2005 and the .NET Compact Framework,” he says. “There’s just nothing comparable for other development environments.”

The integrated nature of the environment made a big difference, too, says Kedy, especially because of the way he was working on the project. “Working in the off hours and often on my own, it was essential that I have access to all tools within a single, already fully configured environment,” he explains. “With Visual Studio 2005 and the .NET Compact Framework, I simply connected the mobile phone, created a Windows Mobile-based project, and coded, tested, and debugged, just as if I was working in the full Microsoft .NET Framework and targeting a stationary client environment.”

Full-Featured Tools for Rich Capabilities

Kedy also found that virtually all the features he needed were easily accessible. “For example, we wanted to use a serial connection between the phone and the Bluetooth device,” he explains. “In other development environments, we would have had to import special packages to do this, but in the .NET Compact Framework, a built-in serial-port object simplifies monitoring and configuring the port and sending and receiving the data.”

The same simplicity was available for implementing polling. As Harvell explains, he and Kedy wanted to use a direct socket-to-socket connection for polling and processing the location data, an activity that depends on components running on both the client and the server. “We made this decision because a

“This [solution] provided a tremendous level of visibility for CapTech Ventures.”

Darrell Norton, Director of Microsoft Solutions, CapTech Ventures

direct socket connection between the mobile device and the application server provided higher performance than a Web service would for this vital task,” Harvell says. “So it was vital that we be able to implement this approach easily, which we did in the .NET Compact Framework environment.”

At the same time, the developers liked that the technology supported both approaches. “Although we found the direct socket-to-socket approach better for this rollout, we might find in a future release that using Web services would make more sense,” Kedy says. “It’s fortunate that the overall platform—especially the Windows Mobile-based device—supports both Web services and direct socket-to-socket connections.”

Another feature that helped the developers to maintain flexibility for future versions of the solution was portability, especially of the Visual C# code that Kedy developed in Visual Studio. “We were very happy with the mobile phone and Bluetooth devices that we used for this year’s race,” he says. “But with the rapid evolution of such devices, it’s good that we have the flexibility to deploy to a different Windows Mobile-based device if we should want to do that for the 2007 race.”

The Power of Positive Publicity

For Richmond Sports Backers and CapTech Ventures alike, perhaps the most significant advantage came in having a solution that ran flawlessly on the race day itself—especially for fans viewing it on television. In addition to a record number of runners and spectators in attendance, nearly 85,000 people watched the television broadcast for at least 15 minutes over the course of the two-hour event. These numbers placed the program second in overall viewer volume during that timeslot.

Schricker acknowledges that the Dash for the Cash contest itself generated plenty of fan interest. But he also argues that displaying the course with the progress of the Dash runner and the lead runner—who, not surprisingly, won the race—generated even more fan interest. “There was a lot of excitement around the Dash for the Cash when we first introduced it in 2005,” he says. “But this year, at least 30 or 40 people came to me later, even days after the race, and asked how the Dash contestant did, who won the race, and so on. That’s something that did not happen last year.”

For Richmond Sports Backers, the additional fan interest could mean big things, among them a better chance of securing television coverage for the SunTrust Richmond Marathon, a major event the organization sponsors each November. As Richmond Sports Backers Events Director Tracey Russell points out, “Television time for any of our events—especially showcasing an intriguing solution like this one—helps all of our events in terms of participants, fans, and sponsors.”

For CapTech Ventures, the strong showing of the Dash for the Cash solution on local television was a major boon for business. “Not only was the CapTech Ventures logo displayed six times within a 35-minute period, but the station gave us a few minutes of airtime as well to explain a little about how the solution worked,” says Director of Microsoft Solutions Darrell Norton. “This provided a tremendous level of visibility for CapTech Ventures.”

Consequently, a lot more people in the Richmond area know what the company does. “We’ve sponsored other sporting events in the area for years, but I suspect that most people seeing our name and logo thought we were a sports-marketing firm,”

For More Information

For more information about Microsoft products and services, call the Microsoft Sales Information Center at (800) 426-9400. In Canada, call the Microsoft Canada Information Centre at (877) 568-2495. Customers who are deaf or hard-of-hearing can reach Microsoft text telephone (TTY/TDD) services at (800) 892-5234 in the United States or (905) 568-9641 in Canada. Outside the 50 United States and Canada, please contact your local Microsoft subsidiary. To access information using the World Wide Web, go to: www.microsoft.com

For more information about CapTech Ventures products and services, visit the Web site at: www.captchventures.com

For more information about Richmond Sports Backers products and services, visit the Web site at: www.sportsbackers.org

CapTech Ventures Marketing Director Tim Miller explains. "So when we decided to cosponsor the Ukrop's Monument Avenue 10K this year, one of our objectives was to convey to the public that we are a technology firm with strong competence in the mobile arena. Through the Dash for the Cash solution we developed with the help of Microsoft technology, I think we accomplished that very effectively."

Microsoft Windows Mobile

Windows Mobile brings the power of the Windows operating system to mobile devices, helping businesses and their mobile employees stay connected while on the go. Windows Mobile runs mobile versions of Microsoft programs, including Microsoft Office Outlook® Mobile, Internet Explorer Mobile, Pocket MSN®, Windows Media® Player Mobile, and Microsoft Office Word Mobile, PowerPoint® Mobile, and Excel® Mobile. With Windows Mobile, information workers get powerful software combined with the familiarity of Windows. Combined with available service plans and connectivity options, Windows Mobile-based devices, available from 42 device makers and 68 mobile operators in 48 countries, can be used to make calls, send e-mail and instant messages, surf the Web, and access critical business information even when users are away from the office.

More information about Windows Mobile can be found at:
www.microsoft.com/windowsmobile

Software and Services

- Microsoft Windows Mobile 5.0
- Microsoft Servers
 - Microsoft Windows Server 2003 Standard Edition
 - Microsoft SQL Server 2000 Standard Edition
- Microsoft Visual Studio 2005 Professional Edition
- Microsoft Windows XP Professional Edition
- Technologies
 - Microsoft .NET Compact Framework
 - Windows Forms

Hardware

- Sprint PPC-6700 (Pocket PC Phone Edition 6700)
- GlobalSat BT-338 Bluetooth GPS device
- VGA scanner

Partner

- CapTech Ventures