



Farming Goes High Tech



ProKarma created a solution that gives farmers a unified, Web-based system to control and monitor resources and equipment from different vendors and the ability to better utilize scientific data for effective farming.

THE BACKGROUND

The client is an international company leading the industry in irrigation products by merging advanced technology with high functionality to meet customers' needs. As the worldwide leader in center pivot and linear irrigation equipment with operations in 20 countries, the client provides farmers with solutions for conserving water and meeting the growing worldwide demand for food.

Farming, the world's oldest industry, is undergoing rapid change due to increasing demand in emerging markets and technological advances that have changed the way farmers work. By the end of the 19th century, farmers were able to cover more land at a faster pace, fueling an increase in both the size of farms and their production -- fewer farmers are working, and on larger farms than in the past. Today, the average U.S. farmer is able to feed 155 people, compared to 19 people in 1940.¹

For more than a decade, farmers also have enjoyed the advances of precision agriculture, and researchers estimate the productivity gains at 10 percent and average input savings of 15 percent for GPS-enabled technology alone.²

Many industry watchers expect the rate of adoption of precision farming solutions to only increase as aging growers are replaced by a younger generation. As of the USDA's 2012 census of agriculture, the average farmer in the U.S. was 58 years old, with nearly six farmers over the age of 65 for every farmer under 35³, and many of these tech-savvy incoming growers graduated from agricultural colleges with coursework covering farming automation and technology.

THE PROBLEM

Central to the client's mission is the desire to give farmers solutions that improve their quality of life, and with more than 2 million farms in the U.S. alone⁴, this is no insubstantial goal.

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In a traditional farm setting, the farmer needs to physically be in the field each day to monitor the equipment, assess its condition and take readings. With equipment manufactured by a variety of vendors, farmers must learn to use multiple software tools to configure each piece of equipment. In addition, there is an industry-wide underutilization of scientific data for effective farming; for example, many irrigation systems continue to sprinkle water, even when it's raining.

An increasing number of farmers are turning to precise control and monitoring capabilities that allow them to more efficiently manage their business – freeing up time and money for other undertakings in an industry with notoriously small profit margins.

With more than 50 years of experience and more than 40,000 irrigation systems sold, the client had a strong foothold in the industry but needed to modernize its products to retain its industry-leading status. The irrigation company turned to ProKarma, a global IT solutions firm with extensive experience in data-driven systems and applications development, to lead the project.

THE SOLUTION

ProKarma's challenge was to take the client's outdated BaseStation2 Windows-based product and upgrade it to a Web-based platform. ProKarma also was tasked with enhancing the feature set and overhauling the user experience (UX) and user interface (UI) through wireframe and visual design.

ProKarma assembled a team of more than 45 people to develop a unified system that can control and monitor different irrigation equipment from different vendors. A farmer can access the system, which helps utilize critical resources effectively by calculating scientific data, via the desktop or mobile app.

The system included software that manages the pivots; stops or starts the divots; controls and monitors irrigation; pumps fertilizers; monitors soil moisture; and manages ancillary tools and devices attached to the center irrigation. All information, including video, is relayed to the computer for use by the farmer.

To accommodate these features, the ProKarma team architected and designed the solution on an advanced .NET framework using .Net 4.5, Windows Communication Foundation (WCF)/HTTP services, WebSockets/SignalR and HTML5/CSS3/Backbone. The end result was a secure solution built with reusable components via responsive design that allowed the client to modernize its systems, update its feature set and improve the user experience to better meet the needs of its customers around the world.

- 1 *Comparing agriculture of the past with today. Animal Smart. <http://animalsmart.org/animals-and-the-environment/comparing-agriculture-of-the-past-with-today>*
- 2 *Pham, Nam, D. The Economic Benefits of Commercial GPS Use in the U.S. and The Costs of Potential Disruptions, NDP Consulting Group (June 2011) at 6 – 7, <http://www.saveourgps.org/pdf/gps-report-june-22-2011.pdf>*
- 3 *http://www.agcensus.usda.gov/Publications/2012/Preliminary_Report/Highlights.pdf*
- 4 *<http://www.epa.gov/agriculture/ag101/demographics.html>*