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ThingWorx, a PTC Business Case Study

Smart, Connected Applications Maximize Agricultural Business Performance

"ThingWorx Platform Gives OnFarm Rapid Go-to-Market Capabilities"

In 2011, Lance Donny, the CEO and founder of OnFarm, identified a unique opportunity to leverage his extensive personal agricultural knowledge with connected applications to create and deliver a transformational suite of Internet of Things-based agricultural management services. These services would be delivered as easy-to-use, smart, connected product applications that would provide OnFarm's customers with the ability to have a real-time big picture of the large and varying data points necessary for them to create optimal agricultural working and growing conditions.

As with any business, the goal of agricultural and farm management is to drive profitability. To do so in agriculture requires optimizing three key variables: production yield, cost, and risk avoidance, and having a real-time and holistic big picture for optimizing each variable for maximum profitability. Every agricultural business faces unpredictability on a daily basis that in turn creates numerous environmental conditions and potential outcomes that must be carefully understood and constantly managed.

By 2010 field-located sensors had already begun to play a significant role as a tool utilized by agricultural professionals to manage this unpredictability in their daily operations. Today, sensors continue to become more reliable and create the ability to capture large data sets of real-time information at increasing levels of granularity.

OnFarm understood that despite improvements in sensor technology, there were still major barriers to greater agricultural use of the technology, specifically with the challenge of sensor interoperability. Data from one sensor platform is often incompatible with data from other field resources, and there was no real way to integrate them and extract valuable "correlated and actionable" real-time information.

Further, these systems now typically generate far more aggregate and real-time data than businesses can or should handle. The combined challenge of analyzing these incompatible and now large, growing, and disparate data sets, as well as a fundamental inability to correlate the data and create actionable events, had created an agricultural technology environment that failed to maximize potential smart, connected product value.

AT A GLANCE

Business Challenges

OnFarm needed to move quickly to capitalize on a significant "smart agriculture" opportunity to build connected applications and dashboards that captured and monitored sensors in the field and provided actionable data back to their customers.

Solutions

OnFarm relied entirely on ThingWorx's extensive IoT development platform and ecosystem to quickly deliver on connected smart application capabilities.

Benefits and Results

- OnFarm is now able to focus on its business and not on IoT technology issues
- OnFarm significantly reduced time-to-market
- The company was able to develop applications 18 to 24 months faster than previously estimated
- OnFarm saved approximately \$2 million in development costs



Key OnFarm IoT Business Drivers and Challenges

Donny saw a clear technology and business problem in need of a real solution, and OnFarm launched their goal of creating a SaaS-based software platform that would bring together the disparate data in meaningful ways. OnFarm would deliver real-time, field data-driven reports providing the business intelligence needed.

The overall solution OnFarm determined necessary was a set of "dashboard-driven connected services utilizing an IoT backend" that would accomplish several key things:

- Easily collect data from incompatible sensors via wireless networks
- Provide a means to integrate, analyze, and correlate different data sets of information into easily-understood and easy-to-customize reports leading to specific actionable outcomes
- Manage end-user permissions, distribute reports and business intelligence through a customizable Web interface that would include dashboards, allowing custom organization of data applicable to the business employing OnFarm's suite of services

Being first to market was an essential part of OnFarm's business plan, and Donny understood that they needed to act quickly on this suite of services. But the company faced a daunting task - it would take very expensive engineering resources and an extensive period of time to build out the development platform to deliver on the vision.

An initial search for an IoT application development platform suitable for OnFarm's needs led to their relationship with ThingWorx in early 2012. Donny refers to engaging with ThingWorx as "OnFarm's first true make-or-break decision." It was clear to OnFarm that ThingWorx was well-thought-out, well-engineered, and provided exactly the IoT development framework OnFarm was searching for. Utilizing ThingWorx would eliminate the core engineering it would have otherwise needed to develop in-house.

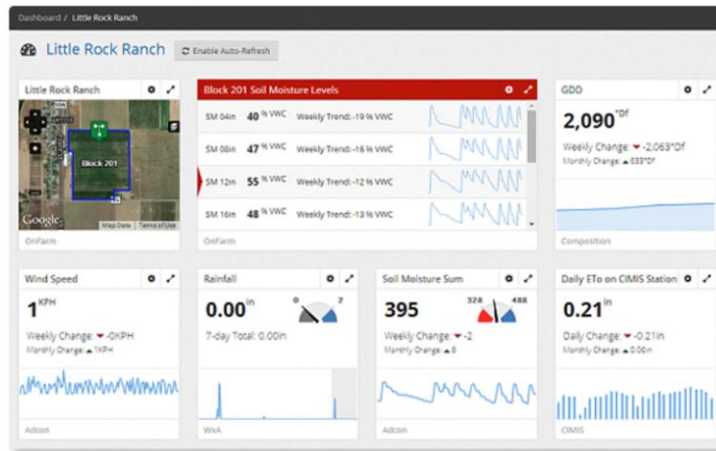
ThingWorx Platform: Solution and Benefits

ThingWorx clearly understood how to capture, manage, and scale sensor data from multiple sources, and additionally, understood and embraced two-way communications with field sensors and remote devices, while enabling easy integration with third party APIs from the hardware vendors. On the end-user side, ThingWorx was designed from the ground up to allow companies such as OnFarm to quickly build out unique IoT applications, dashboards, and multi data-sourced mashups for its own customers.

OnFarm developed and built its custom front end in Angular and JavaScript for its business intelligence dashboards, and utilizes ThingWorx' Mashup Builder to manage devices, streams, and end-user permissions that simplify usage for its customers. An example of the OnFarm Grower Dashboard™ is shown below.

"ThingWorx removed a great deal of engineering complexity for OnFarm. We no longer needed to worry about backend systems infrastructure or application platform development. It was a no-brainer for OnFarm to become an early adopter of what would soon be many ThingWorx customers."

Lance Donny
CEO, OnFarm



Source: OnFarm, February 2015

Utilizing ThingWorx not only allowed the company to focus its energies entirely on their agricultural domain expertise, but also gave Donny the first to market advantage critical to his business model. This, in turn, allowed his team to focus on the business of selling the OnFarm platform and establishing a partner ecosystem through its OnFarm Ready program.

Reflecting on the last two years and looking ahead to a continued deep relationship with ThingWorx, Donny notes the following key drivers that will continue to provide significant business value and opportunities for OnFarm:

- Donny estimates that OnFarm saved several million dollars in development cost and gained significant time-to-market advantages. Working in the field directly with customers and partners, rather than being behind closed doors in engineering mode, was critical to developing OnFarm's own customer deliverables.
- Donny further points out that ThingWorx has a highly responsive team in place. For well over two years, the two companies held a weekly call, and OnFarm constantly pushed the ThingWorx team on both performance and enhancement issues. It was critical to OnFarm that ThingWorx was willing to invest a great deal of effort to quickly solve platform challenges OnFarm would uncover in the field.

OnFarm currently targets businesses with at least 100 acres and usually much more. Through utilizing ThingWorx, OnFarm is also now able to easily develop solutions for smaller growers. Donny notes that the efficiencies created by ThingWorx are directly responsible for making it possible for OnFarm to begin targeting smaller businesses. On a larger scale, OnFarm is now well-positioned to drive its greater business goal to begin delivering on larger regional possibilities, such as embracing big data, and big data-driven analytics.

Such solutions create significant opportunities for OnFarm. Donny notes the possibilities with justified enthusiasm, and points out that "without ThingWorx, none of it would be possible for OnFarm to effectively deliver."

"By leveraging the ThingWorx platform we estimate that OnFarm saved at least several million dollars in development and engineering costs and gained a great deal of time-to-market advantage and benefit. Further, we believe that PTC's well thought out PTC-ThingWorx integration now leaves ThingWorx well positioned to stay two steps ahead of what OnFarm requires."

Lance Donny
CEO, OnFarm



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[Visit our website](#) to learn more about ThingWorx,
a PTC Business, or [contact us](#):
350 Eagleview Blvd, Suite 200, Exton, PA 19341
(610) 968-1500

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