The Business Case for Buy Vs. Build in Rapid Prototyping Environments

by Mike Prorock

Summary:
Meaningful data hinges on action, and without the right analytics platform, data is basically meaningless for the majority of users. Learn why mesur.io decided to buy vs. build, and hear the impact that decision has had on our development time, market position, and customer satisfaction.

Body:
In today's tech world, having enough data isn't the problem. We've all heard the unfathomable number of how much data is created everyday—2.5 quintillion bytes to be exact—but what does that mean and why is it important?

In the early 2000s, while earning my degree in marine science, I worked on a project tracking animals and environmental conditions. By attaching a simple tag to a blue crab we could record the salinity, pressure, water temperature, and depth—all the key data points data—but I kept running into the same problem: How do I get this data back out? And more importantly, How do I make this data meaningful so that it provides real insights?

As I progressed through my career, these questions kept nagging at me, and when my family and I moved closer to my aging father-in-law and bought a farm to start providing our own food and to contribute back to the local food web, I quickly realized this data problem was still very much alive. I wanted to monitor the soil on my new land, but all the agricultural monitoring equipment on the market was focused on large-scale agriculture—and what was available to small and midsized farms gave you lots of data but it didn't really address the problem of what to do with all this information.

All the data in the world won't make a difference if you can't get to it. @Qlik

This is a big problem, being that almost 84 percent of the world's farms are six acres or under. Throw in golf courses and garden hobbyists and that's a bunch of people who can't leverage hundred thousand dollar plus solutions.

Armed with experience from previous analytics startups and years of solving hard math and architecture problems for large scale enterprises, I set out to create a way to take all this data

from the soil—temperature, conductivity, etc.—build up a platform to ingest it, and use some of the best-of-breed tools already on the market to interact with that data and make it easy for these small farms to make smarter decisions.

That's when mesur.io began—basically a way for me to scratch my own itch. I wanted to create something that worked akin to the expensive big tools but priced so the majority of the farms on the planet could actually use it, with a simplified interface that focused on the recommendations and data points that mattered.

After building out a few hardware prototypes and the software stack behind it, I started to think about how we could make it so someone could interact with the data and give them a visualization dashboard that did more than just show a bunch of pretty graphs without any real insights. That's when I thought about Qlik.

Qlik Sense
For about eight or nine years, I had used Qlik when consulting for Fortune 50 and Fortune 100 companies, but it wasn't until Qlik Sense came out that I got really excited about what they could do. It's a newish product built much more like a regular SDK for working with data, and the Qlik platform and environment help you manage and interact with data and enables the user to see the connections within their data very easily—solving the problem I had been watching wearily for all these years.

Too many #dataviz tools are just pretty graphs w/out any real insights. @Qlik

Ease of use was exactly what we needed for our users, who for the most part are not the most technologically entrenched people: golf course superintendents, small farm operators, and such. Our devices are very much set-and-forget, and they have to be because our customers are usually dealing with a manpower problem. There's just not enough resources to be constantly checking a bunch of different devices or manually taking measurements.

Customer-Centric Data
This user-first functionality fit in line with our development approach as well. When developing the mesur.io device, rather than going to them with a product and saying look at all this cool data we can pull in, we simply asked them what would help them in their day-to-day job, not just create some flashy piece of equipment that a tech geek or PhD agronomist would think was cool.

Out of that customer research, we designed the hardware and a platform to automatically handle all the key data points. Then we sat down with Qlik and our customers and looked at this data as it was coming off the golf course and asked what kind of data would be useful and

how would they like to see it. That user-centric approach combined with Qlik's absurdly simple drag-and-drop functionality shortened our development time drastically, and more importantly, **shortened our time to market by at least six months**.

We could prototype user interfaces in real time without having to create mockups, write the code, wait on feedback, and then iterate. We had an almost instantaneously feedback loop, and in less than two weeks, were able to rapidly come to market and finalize the design process for golf course superintendents' interface focused completely around their needs.

Buy vs. Build

Now let me step back and answer a question many of you may be thinking: Why didn't we just build all this out ourselves? I've built a lot of software over the course of my career, but one thing I've learned is to always focus on your core intellectual property and key differentiators. Our focus was to make it easy to get at data in remote locations independent of what that data is. On top of that, we wanted to make that data ingestible; we wanted to store it in a format that made it usable for long-term analysis to be able to track patterns as they emerge over time. Then we wanted to implement machine learning to give users recommendations based on historical trends. Those hard science areas combined with all the infrastructure to manage the data are where we can heavily add value, so by buying at the user interface level, rather than building out a dedicated user experience team and spending a whole lot of time writing code, we could maintain our focus and build up our core IP even further.

In addition to the simple time and cost savings, Qlik Sense allowed us to widen our customer base to service customers who actually want to explore the data. Now we can address two markets. With Qlik Sense, we can go after the big universities and agronomy consultants; their tech guys can go in and build out their own analytics on top of our platform without having to worry about how to collect, store, and unify the data that they need to analyze.

Partnering for Scale

But why Qlik, right? Having made decisions around BI and analytics platforms for many large scale enterprises, I was already pretty familiar and had worked with about every leading tool on the market as well as most of the emerging ones. I knew what worked and what doesn't, and more importantly, what works and what doesn't for particular types of scenarios. It's not that tools like Tableau aren't good, but the moment you want to embed that as part of an application stack or pull it into a broader ecosystem, you can't just plug it in without having to do an ungodly amount of work and expect it to scale.

Qlik Sense provided an easy way to do this that would become a native part of our architecture. If we would have chosen a tool like Tableau, once we got to scale, we would've just broken apart. For example, when we're looking at streams of data coming in from the field—millisecond updates—that needs to be visualized out as its occurring, that wouldn't be possible

with Qlik. Yes, we could do it with some sort of custom application stack, but then we'd lose the ability to tie it back to historical data.

Using the Qlik APIs and frameworks, we came up with some custom extensions to let us deal with real-time data in conjunction with historical data and have it all linked together. That association between the data points is key, because when a user goes in and selects a particular variable or subset, they expect everything they're looking at from a data standpoint to be filtered down to the selected area. Qlik automatically does this behind the scenes. So rather than just throwing some charts on the screen with Highcharts or D3, you have all this additional capability that produces real, actionable insights.

Now this isn't just cool from a tech perspective; it's also extremely useful. To show you just how useful, I'll tell you about a very respected golf course superintendent in Maryland. This customer came to us after his mesur.io had been deployed for about 30 days and said he was finally validating things he had suspected for years. From his phone while sitting in the comfort of his living room 20 miles away, he could see what was going on *in the ground* and make decisions based on real data, not just a gut feeling. Just last fall, these insights provided him with real value.

How do you make data meaningful? With real, actionable insights. @mesur_io @Qlik

Temperatures were starting to drop and the normal assumption was they weren't going to have to irrigate quite as much in the afternoon, but after this superintendent had already gone home, he logged onto his phone and saw that the soil moisture was lower than he instinctively thought. He figured something must just be wrong with the device; there was no way his years of experience could be wrong. So, he called his assistant to go and check the moisture manually with a several thousand-dollar device, and he discovered the readings from his mesur.io were dead on. Most of the neighboring course had followed their non-data backed assumptions and had already decided they weren't going to water that afternoon, but our customer called his buddies at other courses and that one reading kept playing conditions at an optimal level in golf courses all through the region—all because of having the right data presented in a meaningful way.

That testimony confirmed for us that not only were we doing things right from a user interface standpoint but we were also filling a real need. All the data in the world won't make a difference if you can't get to it—and worse, if it isn't actionable.

If I've learned one thing in my career, it's that meaningful data hinges on action. If you can act on it—in this case, protect resources, be it land or water, and make food more abundant—you can make it better.