

## CASE STUDY



## Using big data to help feed the world.

“ By 2050, the world’s food demand is expected to increase by 70% as the global population increases to 9 billion people; a 34% increase from today. Although the population is growing rapidly, the amount of farmland and resources are not. ”

### SUMMARY

As farmers grapple with how they will feed an increasing global population, the need to harness data and analytics has become more critical. Changing diets, demand for healthier food options, and decreasing water availability are just some of the challenges that face agriculture today. Combine that with global market volatility and rising input costs (such as water, chemicals, seeds, and more) and it is harder than ever for farmers to be profitable and sustainable.

As Proagrica searched for ways to help the agriculture industry use data-driven decision making for crops and livestock production, they decided to adopt HPCC Systems® as their big data partner. HPCC Systems not only delivered a scalable, resilient and secure platform, but it also met their projected future expansion needs.

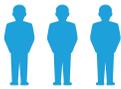
# Proagrica Case Study

## CHALLENGE:

### Helping agriculture meet the challenges of the 21st century

Proagrica is a leader in the agriculture industry, driving growth and improving efficiency by delivering high-value insight and data, critical tools and advanced technology solutions, and a range of effective channels-to-market. The goal is to deliver superior products and services that connect and empower industry participants to feed and fuel the world sustainably.

When people think of agriculture, they typically think of growing crops. It seems like a simple concept – plant seeds, hope for good weather, and harvest your crops. But agriculture in the 21st century is vast and complex. Utilizing data and analytics allows everyone from farmers to manufacturers to think more strategically about their business. Evidence-Based Production tools, such as farm management systems, collect enormous amounts of real-time data on farms - from fertilizers applied to crops, crop plantings, soil testing, and many other aspects of farm management. Instead of relying on handwritten reports or bi-annual data to make decisions, farmers can use real time data to make changes immediately and in-season. The data aids in the traceability of animals and crops. Retailers now have an audit trail verifying that organic meat and vegetables are indeed organic because there is data to support such claims.



Current World Population

34% rise by 2050



Current World Food Demand

70% rise by 2050

Why is this important? By 2050, the world's food demand is expected to increase by 70% as the global population increases to nine billion people; a 34% increase from today. Although the population is growing rapidly, the amount of farmland and resources are not. In fact, in many countries farmland is being turned into housing developments and climate change has impacted soil making once farmable land unusable. The end result is that farmers need to improve productivity while utilizing less resources.

Understanding these challenges, Proagrica started to investigate if they could develop a data and analytics business that could better adapt to the growing needs and complexities of the agriculture industry. The idea was to create a customer platform that enriches all aspects of the agriculture supply chain with precision data, services, and advanced analytic tools providing real time insights to help the entire industry react quickly, forecast effectively, and maximize profits.

But this new idea was not without challenges. The landscape of agriculture is extremely complicated and there are massive amounts of diverse data sets. With more than 570 million farms, 25 million tractors, 50 billion chickens, 1.5 billion head of cattle, and so much more on the world's farms, there are tremendous numbers of potential data sources. And everything on a farm generates data – including the tractors, animals, soil, weather, sensors, drones, satellites, chemicals, and more. There is a lot of data to consolidate, organize, and enhance to help drive value across all sectors of the agriculture industry, from the farm to the supermarket shelf.

Graeme McCracken, Managing Director for Proagrica, puts it into perspective, “Just the amount of sensors that there are in agriculture is astonishing. It's got more data than any other market I've seen, whether it is sensors measuring the gait of a cow as it walks into the dairy parlor, or chickens that are pecking. The cows, where they go in the field, what they are doing in the field, what the temperatures are, whether or not they're fit, the whole range of things that get measured and these sensors, these devices, are all measuring it in different ways, and the real challenge is to take that vast plethora of data and consolidate it and to create meaning for it on a global basis.”

## SOLUTION:

### Fast, accurate and actionable marketing information delivered via interactive platforms

Proagrica needed a massively scalable data refinery environment for ingesting and transforming structured and unstructured big data from diverse sources. Additional requirements for the big data solution included being able to seamlessly work with their enterprise service bus, help deliver quality/clean data, provide data security, and deliver real-time analytics their customers demanded.

The decision to adopt HPC Systems, a proven and enterprise-tested platform for manipulating, transforming, querying, and warehousing big data, was an easy one. The open source platform features Thor, a data refinery capable of processing billions of records per second, and ROXIE, a data delivery engine capable of supporting thousands of users with sub-second response times. Together they provide an end-to-end solution for big data processing and analytics that supports rapid growth. And HPC Systems provided another benefit – they focus on data.

It may sound odd to say Proagrica wanted a big data solution that focused on the data, but many platforms they looked at were geared more toward storage of data than letting you run rules across it. Graeme explains, “Thor is absolutely fabulous at taking data from a multitude of different sources and helping you create a canonical version of it, developing the entity models and the attributes around entities, and then create meaning of that. So that was the thing that really drove us into HPCC Systems, and I think we’ve come to really see the power of HPCC Systems and what it can do for us as a business.”

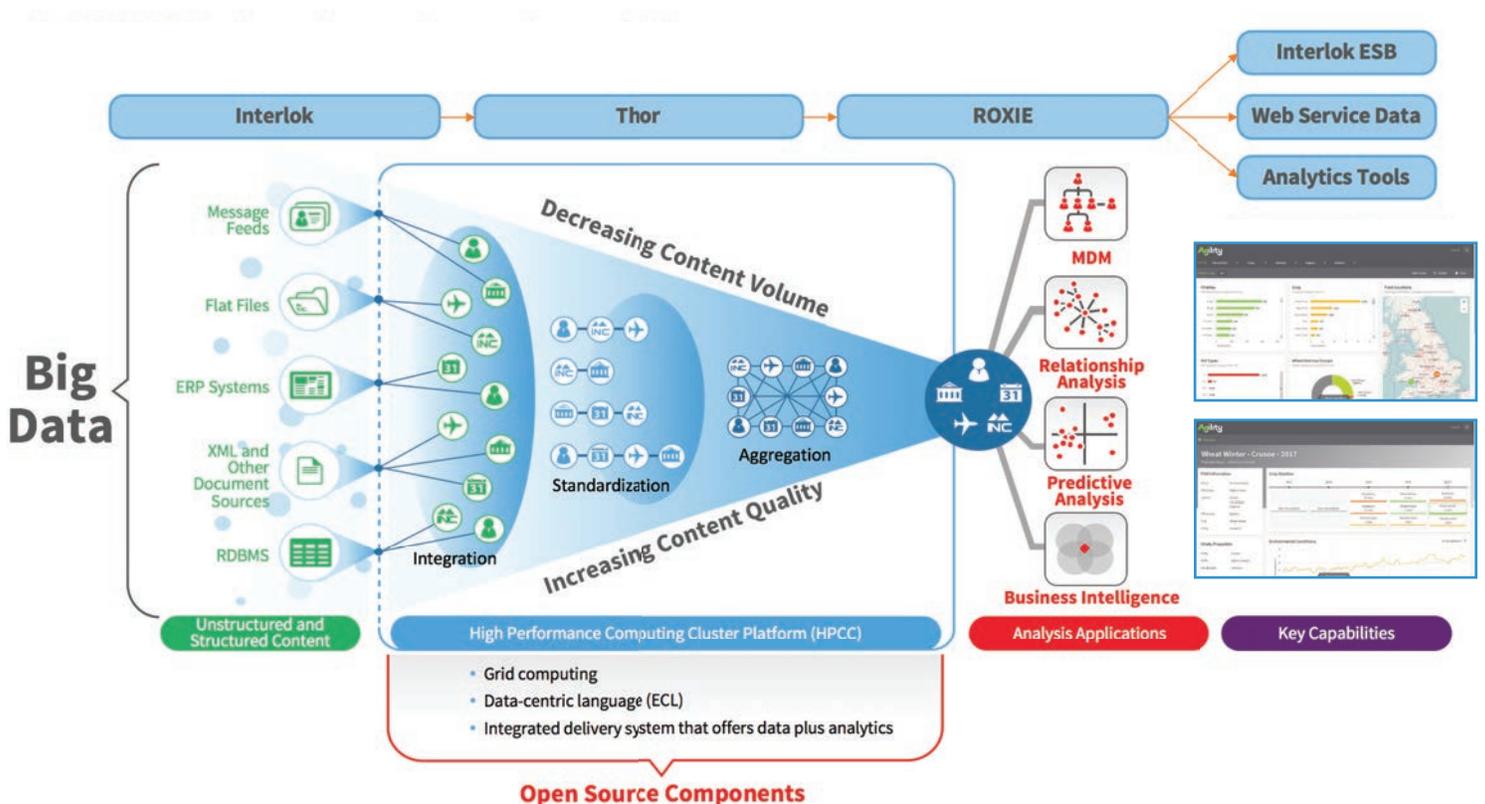
HPCC Systems also proved to be beneficial when it came to increasing data accuracy. Farmers are busy people and often use their own version of shorthand or handwritten journals to keep records making data accuracy a real challenge. If a farmer uses their own shorthand or there is a spelling mistake, it can skew results and therefore, the quality of the results sent back to customers. Jeff Bradshaw, Group CTO for Adaptris within Proagrica, elaborates, “We did a preview concept with another vendor probably a year and a half ago and the biggest challenge was the data volume and the cleanliness of data. So data hygiene for us now is not such an issue, which is great as we’re expanding the platform and on-boarding more farm management systems around the world.”

Further aiding with the data volume and quality issues was ECL, Enterprise Control Language, the language for HPCC Systems. ECL proved to be very easy to use and unlike many languages that require lots of coding to be developed, ECL just needed to be told what to do not how to do it. Being able to get to the data faster meant developers could focus on the meaning of the data vs trying to massage it into a specific form resulting in a massive time savings.

As part of the development, Proagrica integrated HPCC with their own enterprise service bus, Interlok, using the Interlok adaptor to provide seamless connection to hundreds of applications, data standards, and protocols. Being able to link HPCC Systems and Interlok also proved to be instrumental in ensuring the security of the data. HPCC Systems allowed a whole permissioning layer that could be controlled very strictly via a permission portal that is integrated on the way in and on the way out via Interlok.

Whilst vast amounts of structured, canonical and permissioned data is incredibly useful, Proagrica wanted to deliver analytics and workflow tools fully integrated into industry solutions. HPCC Systems was able to offer a solution by providing cloud computing and data visualization with the capacity to manage vast volumes of data while generating real time analytics on an easy to use platform proved to be very valuable.

## PROAGRICA HPCC SYSTEMS PLATFORM



## RESULTS:

### Proagrica + HPCC Systems is the key to unlocking value across the agriculture industry

Proagrica is revolutionizing the agriculture industry by providing the most time and cost effective big data solution. Their partnership with HPCC Systems provides a scalable, resilient and secure platform that can consume data from any source, consolidate, enrich, and expose global agricultural data from soil to animals and all the way to satellites. The result enables customers to increase yield and profitability while reducing inputs and improving environmental impact.

## CROPS AND BEYOND

While Proagrica's big data solution originally focused on crops, they are expanding their offerings to dairy, beef and poultry, fish, small animal, and veterinary. Having built the original platform, they are now scaling into these new markets and focusing on Evidence-Based Production.

Proagrica defines Evidence-Based Production as the method of farming that embraces technology and utilizes data to inform on-farm production. Farmers, agronomists and industry advisors in every sector from arable, beef, dairy, and sheep are always checking recommended lists, EBVs, and other key performance indicators to understand what the most profitable, efficient and appropriate course of action is to take on their farm. Using this evidence is the way that agriculture has grown into the industry it is today. However, data has always been available after the fact – yield, soil analysis, dead weight. With technology now capable of sharing real-time data, making those informed decisions part of every day is now possible.

Farmers and their agronomists are now able to see what's going on in the equivalent fields across the country – they can compare their crop protection plan with others who are growing the same wheat variety, with the same soil type and rainfall for example. This opens the door for farmers to balance the risk, and work together as an industry to improve food security and resource use.

## CUSTOMERS:

Proagrica has over 3,600 agricultural customers including Cargill, AGCO, DU PONT, Pfizer, Merial, and CF Industries.

## Benefits of HPCC Systems

**Scalability and Rapid Development:** Massively scalable data platform supports rapid development from a growing set of real time data sources.

**Ease of Use and Data Hygiene:** Developers can quickly and easily learn ECL, allowing them to create rules to refine and clean data from a multitude of different resources and increasing data accuracy.

**Flexibility:** Seamlessly integrates with existing infrastructure to simplify deployment and management capabilities.

**Real Time Analytics:** Ability to handle massively diverse amounts of real-time data combined with built-in analytics libraries for Machine Learning help to quickly extract insights.

**Security:** The platform features a wide array of extensive, configurable and customizable security features.

For more information, call 866.528.0780 or visit [hpccsystems.com](http://hpccsystems.com)



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