

BUILDING A KIWIFRUIT BREEDING PLATFORM



Plant & Food Research (PFR) is a New Zealand-based science company providing research and development that adds value to horticulture, viticulture, aquaculture and food products. Plant & Food Research's kiwifruit cultivar development is researched across several PFR sites with Kerikeri, Te Puke and Motueka being the main research stations.

With over 900 people based at sites across New Zealand, as well as in the USA and Australia, Plant & Food Research has a goal to support the growth of plant and marine-based industry through the successful application of research-based innovation.

Their science supports the sustainable production of high quality produce that earns a premium in international markets, as well as driving the design and development of new foods that offer benefits to our health and wellbeing.

THE CHALLENGE

Integrated information systems for the capture and retrieval of breeding and research information are essential for PFR to make better decisions quickly in the development of new cultivars including Kiwifruit. Their existing breeding data management systems, which were a mix of commercial and in-house solutions did not fully meet their requirements, were not fully integrated with each other and were unable to scale to meet predicted data management demands.

PFR wanted to establish a new information platform with a focus on data availability through integration that provided stable operation, improved functionality including traceability, enhanced usability and the scalability to match future operational demands.

PFR was looking for a partner that could work with them at an architectural level to architect the desired platform, along with developing the solution alongside PFR and provide additional support for new innovative features when required.



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OUR APPROACH

When PFR engaged Cucumber on their project, they had a clear idea of what they needed but wanted Cucumber to provide sound technical advice and assistance in architecting the solution.

Collaborative workshops around solution architecture, technical design and user experience were held with representatives from both organisations. The key focus was to determine the architecture and technology stack to meet the key requirements of robust infield data collection, storage and accessibility for reporting and analysis.

The proposed development programme adopted a modern “services architecture” and domain driven design to simplify data integration and address performance issues. The teams adopted an Agile development approach. This was PFR’s first large Agile project which resulted in a blended Agile team from both organisations that worked on a two-week sprint cycle.

THE OUTCOME

The new platform allows flexibility of capturing data from multiple sources, whilst allowing users to generate reports and queries simultaneously using their preferred toolsets. Modern User Interfaces have been developed for efficient data capture in the field (offline and online) and laboratory.

PFR are planning on retiring older applications and missing functionality will be added to data management platform to further enhance its capability.




The developed platform uses a number of readily available open source applications, coupled with bespoke developed components. These include Postgresql for relational data, Couchbase for offline data replication to mobile devices, and Keycloak for user access and management.

With production launch in August 2019, the PFR team will be able to source more accurate data from the field which is synchronised and stored more simply, saving them time and increasing accuracy for decision-making. PFR are now able to have all their data centralised so it’s all in one place and they can more easily analyse it, and have a robust and saleable platform that is supported and maintained on an ongoing basis.



“The working relationship with Cucumber is good, we have a blended team of internal and Cucumber staff that have daily contact, and we now have a working prototype for our orchard which we’ll use for the next kiwifruit season. I would strongly recommend Cucumber to other companies, particularly in the Agritech area.”

Guy Davenport, Data Programme Leader

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