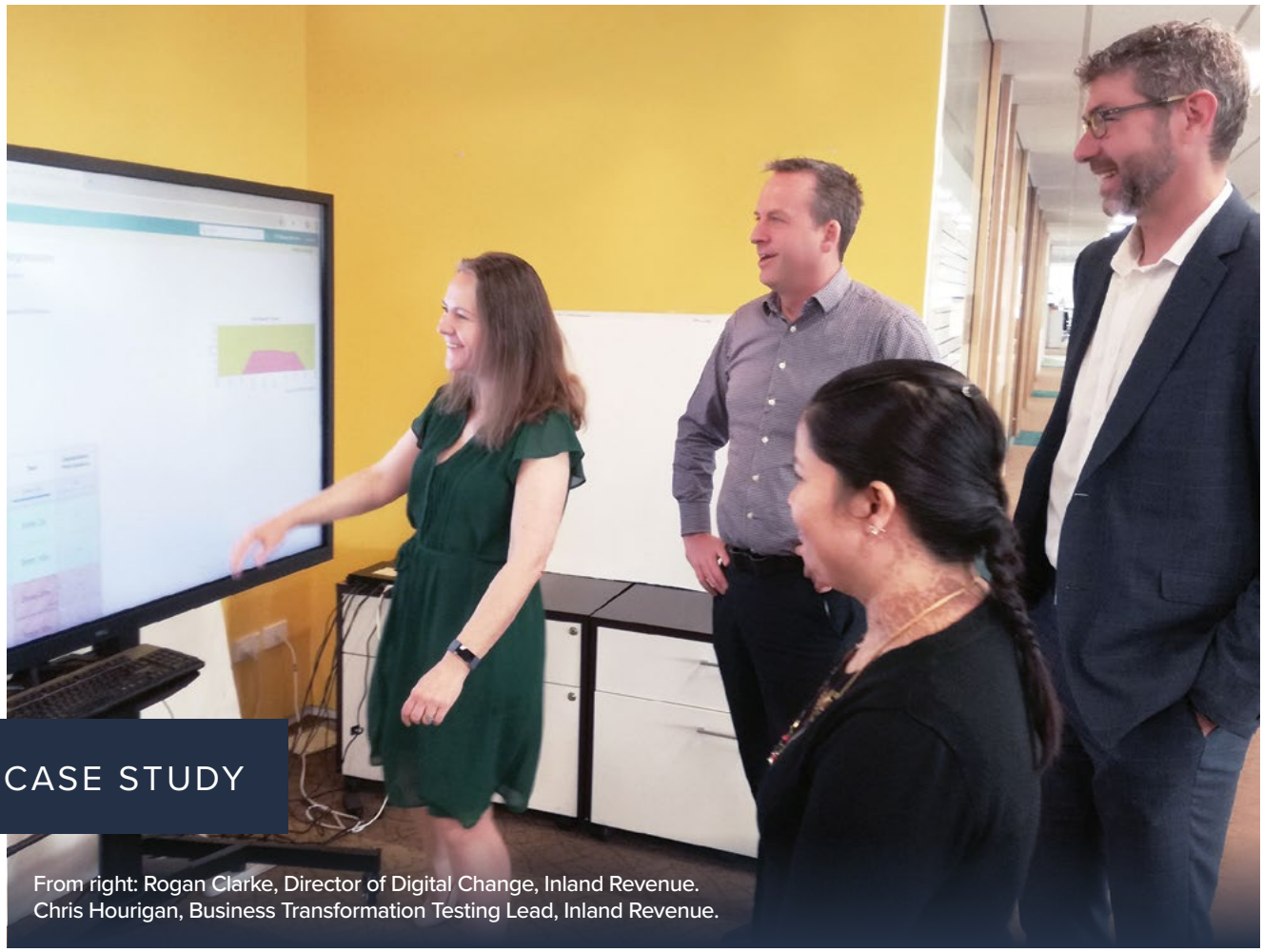
Putting Inland Revenue's business transformation to the test



From right: Rogan Clarke, Director of Digital Change, Inland Revenue.
Chris Hourigan, Business Transformation Testing Lead, Inland Revenue.

CASE STUDY

As it undertakes the largest business transformation journey in New Zealand, the Inland Revenue department has engaged Assurity Consulting to provide an innovative approach to systems integrity which enables self-service testing by the multiple partners playing a role in the execution of its mandate. The result is Digital Partner Services (DPS), a cloud-based automated solution[1] which equips partners with the tools they need to test, validate, and confirm the quality of systems integrations on the fly. The solution plays a role in accelerating the introduction of Inland Revenue services by automatically identifying errors, reducing, or eliminating manual interventions, and allowing partners to work at their own pace.

Inland Revenue (IR) plays a critical role in improving the economic and social wellbeing of New Zealanders, collecting 80% of Crown revenue, as well as collecting and disbursing social support programme payments and providing the government with policy advice. Since 2014, IR has embarked on a $1.8-billion Business Transformation project, making it simpler and faster for New Zealanders to pay taxes and receive entitlements.

Chris Hourigan, Business Transformation Testing Lead, Inland Revenue

Situation

At the heart of IR's business transformation is the replacement of the legacy tax system with a new custom-off-the-shelf solution. IR shares information from this core tax system with other government agencies, software providers, partners and suppliers, which integrate with its systems for the delivery of IR services countrywide. In an increasingly common IT challenge, the systems are being upgraded without interruption to services provided - the equivalent of changing engines on an aeroplane whilst in flight.

IR's Director of Digital Change, Rogan Clarke, describes the business transformation as one of the most ambitious he's ever seen. "IR got into the transformation programme because legacy systems limited our ability to adapt to new policy. At the heart of it, it was decided that if we're going to change, let's think big – and IR really did think big. Exceptionally big."

IR Business Transformation Testing Lead Chris Hourigan points out two essential factors relating to the organisation's systems: "We operate complex systems engaging with hundreds of thousands of customers across multiple channels. At the same time, the requirement for accuracy is high, so we must execute assurance practices which maintain a level of integrity and consistency for all channels and customers."

"We have to deliver to the highest levels of trust to a large and diverse range of customers, from individuals, to social policies, student loans, businesses and the intermediaries including tax agents, that support the ecosystem."

For testers, Hourigan says the goal is ensuring system stability, performance, and integrity across all those touch points as the new tax system is rolled out.

In the past, creating, maintaining, and testing these integrations was a manual and physical process, requiring the attention of teams of skilled people. Each integration took weeks and drove up costs as service consumption had to be tested individually with every external party.

"This quickly becomes untenable. There are around 50 partners working across 5 or 6 tax products, with each product requiring a specific integration with our systems. It's a 'multiplier world', where this large number of partners and the things they can do constantly changes," Hourigan explains.

Solution

Assurity initially set out to test the 'digital border' between IR and its partners. This allowed for easier integration by bypassing structures which interfere with testing, such as firewalls, network, and hardware configurations. The exercise gave way to the creation of cloud-hosted test assets accessible by partners which would allow them to emulate live interactions and evaluate the results.

The resulting Digital Partner Services (DPS) platform - approved to meet government standards for security - extends self-service automated testing for partners, equipping them to understand, code and test their integrations against IR APIs, independent of and decoupled from IR infrastructure. Provided as a pay-as-you-go service, the solution is made available to IR partners as required.

An initial trial validated the DPS concept by providing emulated digital border testing services to a United Kingdom-based partner. With no engagement with IR, this partner consumed the test assets as a service to conduct hundreds of tests in a day – a considerable result which replaced the previous two to four weeks engagement for integration assurance.

In due course, additional functional and smoke service tests were employed through all environments to ensure an automated regression ran daily, capturing change impacts at source. Promoting asset reuse, the emulated service tests are employed by partner performance test teams to evaluate IR's exposed APIs.

Following the DevOps ethos, the DPS service tests are employed to validate the production implementation, allowing IR for the first time to introduce new services tested against IR endpoints, without depending on an external party.

Subsequently, the service journey tests were employed as an enduring Customer Experience Monitor (CEM) service in the production environment, providing real-time feedback on service performance.

Says Hourigan: "With DPS, we can emulate partner interactions using transactional data, feeding that into IR as they would. Automation means we can test continuously across all services, while at the same time, partners access the DPS test assets from the cloud, testing from their perspective."

Results

The successful delivery of the business transformation project depends on a high degree of assurance that every new service, every customer interaction and every system underpinning delivery across multiple channels works – not only the first time a customer engages with IR, but every time.

With DPS, this goal is accelerated, with shortened development cycles and time to market. Third parties are equipped to build and test their systems in parallel with IR and can conduct their assurance programmes simultaneously and independently of the revenue authority's teams, confirms Clarke. "Across internal, integration, and full business function testing, DPS provides an extensive set of assets available to partners to build right and test right. That gives us velocity with quality, resulting in an edge on testing and quality assurance at large."

Already, multiple parallel parties have tested their systems at the same time, far superseding the previously necessary 'one on one' approach.

Hourigan says DPS provides economies of scale and scope, while positioning testing where the partner is. "With business systems that have evolved, testing must evolve too. When testing external integration with multiple partners, you find that new patterns apply. And you have to account for those patterns."

Self-service integration testing, he explains, makes this crucial process easy for IR partners - and easy for IR itself. "The advent of self-service testing technology has enabled significant reductions on partnership testing engagement and reduced the complexity of the testing itself avoiding the reliance on backend systems."

There's hard data to support claims of efficiency gains. Firewall changes have shifted from days to minutes to enable customers to engage in testing.

Third party integrations are up to four times faster, because service consumers are empowered to identify and eliminate errors prior to connecting their systems with those of IR. And the time taken for integration testing is reduced from weeks to days.

The deployment of new tax products is inevitably accompanied by a high volume of change internal to IR; with DPS, continuous testing captures issues that would impact external systems, de-risking the interdependent systems of partners by eliminating issues before they reach production.

Hourigan says the results and benefits of DPS have evolved with the passage of time. "The initial and obvious benefit was acceleration. We are able to onboard new parties rapidly by enabling them to self-service with testing, reducing their need for physical engagement with IR. Provided with the right information, it makes testing easier for them and for us, so both parties win."

As the DPS moves towards business as usual, he says IR is discovering that as it makes changes in accordance with the business transformation programme, pushing updates and new functionality out to partners is simplified. "We've got economies of scale for testing. New features are consumable to everyone at the same time, and everyone can test and evaluate simultaneously. That's a big gain on the previous 'point to point' approach, where each partner would engage individually."

As the services offered through IR's transformed systems multiply, he says the revenue authority is seeing high levels of value. "We get the assurance necessary without being overwhelmed by testing overhead."

Automated, self-service testing is a lasting feature for IR, he notes. "With systems development, it is never the end. In the world of IR one thing is certain: change will happen. Self-service testing with DPS makes handling change so much faster, easier and more precise."

At a glance

Inland Revenue
Te Tari Taake

Company:
Inland Revenue

Industry:
Public Sector

Situation:
Test and on-board new partner services without disrupting the on-going transformation of Inland Revenue (IR)'s tax system and customer experience.

Previously, creating, maintaining and testing these integrations was a manual and physical process which took weeks and drove up costs.

Solution:
Digital Partner Services (DPS), a cloud-based automated self-service solution which equips IR's partners with the tools they need to test, validate, and confirm the quality of systems integrations on the fly.

DPS met IR's high standards for security and was successfully approved to meet government standards for security.

Services provided:
- Created cloud-hosted, reusable test assets accessible by partners which would allow them to emulate live interactions using transactional data and evaluate the results
- Extended self-service automated testing for partners, equipping them to understand, code and test their integrations against IR APIs, independent of and decoupled from IR infrastructure
- Provided DPS as a pay-as-you-go service and made available to IR partners
- Adopted DevOps ethos to employ DPS test to validate the production implementation, allowing IR for the first time to introduce new services against IR endpoints, without depending on an external party
- Employed service journey tests as an enduring Customer Experience Monitor (CEM) service in the production environment, providing real-time feedback on service performance
- Deployed test automation for continuous testing across all services

Outcomes achieved:
- Transformed testing approach - Multiple parallel parties' systems tested vs previous 'one on one' approach
- Sped up third party integrations by 4 times
- Reduced time taken for integration testing from weeks to days
- Reduced time required for firewall changes from days to minutes to enable customers to engage in testing

[1] Using AWS services including Amazon EC2, Amazon ECS, Amazon CloudWatch, Amazon Lambda, Amazon Aurora, Amazon S3 and others