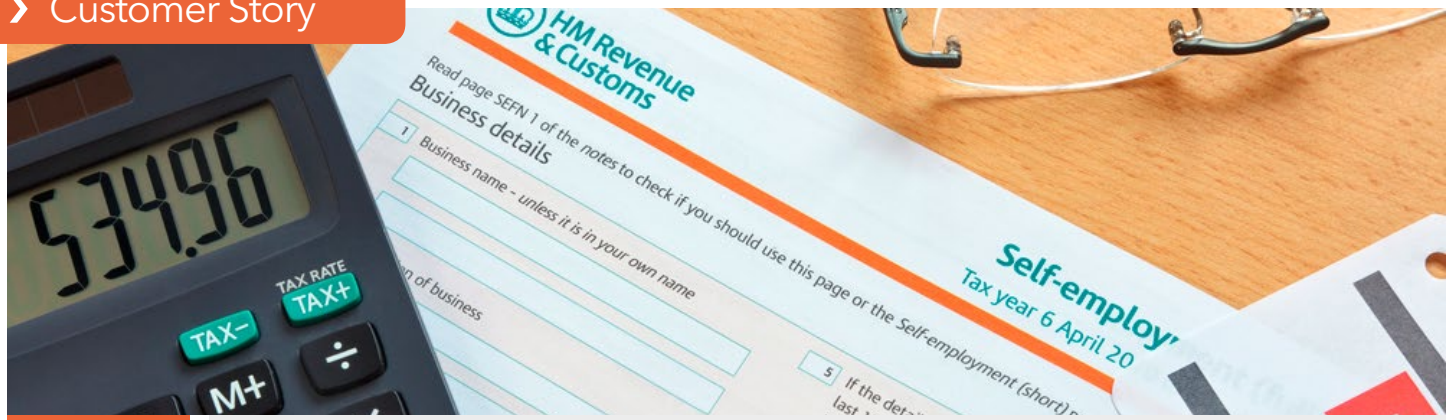
› Customer Story



Industry
Public Sector

Focus
Analytics

Business Issue
HMRC needed a data analytics solution to help it identify tax evasion and fraud in a timely manner.

Solution
SAS® for Government

Benefits
SAS revolutionised the way HMRC collected and analysed data. As a result, they were able to locate billions in additional tax revenue.

Recovering £7 Billion in Additional Tax Revenues

HM Revenue & Customs

Able to search a billion records at the touch of a button, Connect has revolutionised how HMRC deals with fraud detection and prevention

Like tax authorities around the world, the UK's HM Revenue & Customs (HMRC) must deal with significant evasion and fraud, with the scale of criminal activity growing plus the era of big data to contend with. With the UK government allocating £917 million (about US$1.18 billion) in this area – anticipating a major return on investment in the form of £7 billion (about US$9 billion) additional tax revenues – high-performance analytics plays a vital role.

HMRC operates in an exceptionally complex world. It administers direct taxes such as income tax, capital gains and National Insurance contributions along with indirect taxes including VAT, stamp duty and excise. It also handles Child Benefit and Tax Credits. In this world, identifying criminal networks and fraud quickly and efficiently is critical. Hence HMRC's Connect system that brings together numerous internal and external data sources to reveal hidden relationships. SAS has been part of Connect for several years. "The challenge is, of course, actually detecting fraud – in that 'we know what we know' and spotting new activity can be very difficult," says Bill Cockerill, Data Analyst at HMRC. "Being able to react quickly, and deal with extremely large data volumes, is the key."

Technology is just one aspect of the solution, says Cockerill. "We not only require effective tools to access and analyse data, we also need capable people who can use the tools effectively, and that has to be integrated within your organisation. In some ways, technology is the easy part. The hard part is implementing, training your people,and ensuring you have the right structure, working environment and culture. The softer aspects around the analytics are perhaps the biggest issue. Connect meant we could put analytics where they can make the biggest difference: in the hands of analysts, tax professionals and investigators working in collaboration."

> “We’re saving time – for example, we can limit false positive results and avoid wasted interventions.”
>
> Bill Cockerill, Data Analyst, HMRC

A ‘Kaleidescope of Data’

Able to search a billion records at the touch of a button, Connect has revolutionised how HMRC deals with fraud detection and prevention.

Cockerill says access to an extensive repertoire of analytics is required to tackle the huge variety of fraud and evasion, including segmentation and profiling, clustering, predictive models, anomaly detection and more. “Within tax evasion, we can see manipulation in tax and other kinds of electronic records. you need many different tools and methods at your disposal, because someone who may appear compliant could be revealed as noncompliant in another data set,” he says.

“You soon realise you have a highly complex kaleidoscope of data, and how interlinked everything is,” explains Cockerill. “We have our traditional business rules and predictive analysis models, our watch lists, and we also exploit network analysis. And we bring in the all-important human factor – to see patterns that are intuitive and then find ways to convert them into bulk analytics, so they can be used by investigators.”

Cockerill says the complexity of the data and the complexity of the UK tax system pose a real challenge for analytics – and for analysts, too. “When people join us from the private sector, from analytics in banks and insurers, say, they’re used to working in a very linear environment. So to be able to analyse all of HMRC’s customers together and interacting across soft and hard links presents you with an entirely different world.”

Changing the Analytics Culture

The outcome of HMRC’s analytics and the Connect system – working faster and smarter, improving detection rates and finding new opportunities for prevention and deterrence – will see the government avoid significant financial losses and instead receive higher tax revenues. “We’re saving time – for example, we can limit false positive results and avoid wasted interventions,” says Cockerill. “The more we know about people, the more opportunities we have to deselect them. Risks that can seem really strong are explained when you can look at networks and have far richer data to work with. That broader picture means we can ease burdens on taxpayers. We’re also moving into an era of larger data sets that we want to analyse using our toolkit: tables approaching billions of rows in size. In many ways this is becoming much more about ‘heavy lifting’ to get the data in shape.”

John Lord, also from HMRC’s Data Analytics Team, says, “We’re applying analysis across the end-to-end risk process, rather than simply building a model and handing it over. We’re talking to users all the way through to deliver a more useful product which people can actually use to meet their business needs; it’s a cultural thing.” This approach supports HMRC’s taskforce initiatives, which focus activity and resources in particular areas, such as scrap metal dealers in Scotland, bringing different parts of HMRC together to work more fl exibly and develop new best practice approaches from what was learned from the outcomes.

The use of analytics at HMRC is not only about fraud detection, Lord adds: “We’re also looking at what some people call deterrence, others talk about wider impact: What are the impacts on the wider population of different types of interventions, or perhaps on a targeted population? For example, if you have an especially bad offender, we can see what impact that might have had on others.”

SAS gives HM Revenue & Customs THE POWER TO KNOW®

SAS UK & IRELAND WITTINGTON HOUSE HENLEY ROAD MEDMENHAM MARLOW BUCKS SL7 2EB
+44 1628 486933 www.sas.com/uk

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