

*BCS & Computing Awards*

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**IT Outsourcing Project of the Year**

# Business Intelligence Technology helps HMRC Increase Yield

**Staff target fraud  
using information  
previously hidden in  
masses of data**

## **The Situation**

HM Revenue & Customs (HMRC), the UK tax agency, has invested in technology to exploit information and intelligence in their work to tackle fraud and evasion. Whether pursuing organised criminal attacks or identifying common errors, HMRC uses analytics for risk profiling to select cases for investigation and target resources. Capgemini implemented and runs the IT which underpins this work, and which is at the heart of HMRC's compliance strategy.

## **The Solution**

Connect is HMRC's strategic risking tool that cross-matches one billion internal and third party data items to uncover hidden relationships across organisations, customers and their associated data links, such as bank interest, lifestyle indicators and stated tax liability. It captures information from 28 different data sources, and transforms the data into a standard format for Connect analytical and 'spider diagram' visualisation tools. HMRC statisticians produce target profiles and risk and intelligence investigators generate campaigns and cases for investigation. Automated feeds into HMRC's case management system allocate work to the correct caseworkers, and their feedback further refines intelligence in Connect.

## The Results

Connect has enabled an increasing number of successful investigations and over £2.6 billion additional yield to-date. It lies behind the multi-disciplinary units to investigate high-risk sectors, and it enables targeted campaigns which incentivise mass voluntary disclosures. Streamlined risk and intelligence operations are delivered by 40% fewer staff. Skilled staff concentrate on tackling aggressive evasion rather than correcting errors, which historically took too much time, and which is now tackled in other ways.

For the first time HMRC can see all the information they have about a taxpayer at the touch of a button. Connect highlights patterns in HMRC's rich reserves of taxpayer and third party data to find anomalies and commonalities so they can focus skilled resources on businesses, individuals and sectors that pose the highest risk of error, fraud and criminal activity. It produces in minutes what previously took months of research, or was simply not possible to do manually or on a volume basis. HMRC is one of the first organisations to use bulk data analytics and visualisation technology to combat tax evasion in this way.

## How HMRC and Capgemini Work Together

Capgemini manages a partner Ecosystem for HMRC, and we encourage proposals for innovative new solutions to address business challenges. We worked with Detica to showcase their advanced analytical capability at an Ecosystem event. This was an opportunity for enforcement and compliance executives to look at the technology, understand how the insurance industry was using it to tackle fraud, and discuss how it might apply to HMRC. We then worked together with HMRC and Ecosystem partners to gather requirements, and design and build a proof of concept.

HMRC's Connect pilot used Detica analytics tools to assess a subset of tax data for a single geographic region and to cross-reference information from new external data sources. The pilot showed a good return on investment, so it was extended to more tax regimes, which helped HMRC uncover more fraud. Staff found up to a fifth more Self Assessment cases for investigation compared to existing risk profiling techniques, and they used it to help prevent £330 million fraudulent VAT repayments. This established a strong business case to build a business intelligence solution to help transform the way HMRC staff detect and stop fraud and error.

The programme to industrialise Connect included HMRC's IT and compliance community, Capgemini for programme management, system and service integration, and our Ecosystem partners:

- Detica for the analytics toolset and whose consultants helped build data networks and business-led training
- SAS for data analysis and data mining products and tools

From the start of industrialisation it was clear that staff needed to work with Connect to understand its huge potential, and to help address this business and multi-IT partner teams co-located to deliver the change. Previously identifying potential fraud was largely manual and involved analysing spreadsheets of data from individual tax regime systems. Analysts often perceived that IT tools would be too crude to give useful insights, so their role applying their own intelligence and experience to refine Connect was vital to creating an effective, easy to use solution. Investigators and caseworkers reviewed the visualisation tools to agree how the spider diagram of economic activity they uncover is displayed to help them focus on the right questions to start enquiries.

The technical delivery of Connect was phased to deliver the biggest returns to the largest number of users first.

- Phase 1 – Integrated Compliance Environment (ICE) graphical analytical tool and infrastructure to provide risk and intelligence analysts and tax investigators with technology to follow threads of information and highlight anomalies in stated tax liability. ‘Spider diagram’ functionality provides visual representation of the customer and their associated data links such as addresses and telephone numbers, bank interest, income and lifestyle. Users can quickly identify potential compliance and fraud risks and present complex relationships in a simple format, ready for further investigation.
- Phase 2.1 - Analytical Compliance Environment (ACE) risk profile tools - provided technical analysts and statisticians the tools to interrogate and risk profile large volumes of data. They create profiles based on key risks identified within the data and are used regularly to produce a target population for investigation. These profiles are maintained and adapted to reflect changes in customer behaviour.
- Phase 2.2 - Interface between ACE and HMRC’s strategic case management system - delivered automated feeds from ACE into the case management system which assigns, manages and monitors work for 15,000 caseworkers. It centralises case-related information and allocates work to the correct staff so HMRC has a single view of the status of work across teams. Caseworkers input their feedback into Connect to further refine intelligence.
- Phase 3 - Data Acquisition and Networking (DAN) - was the largest, most technically challenging project within the Industrialisation Programme. It captures millions of data items in different formats and transforms them into a structure that the corporate data warehouse passes to the analytical and visualiser applications, via the DAN environment. Data feeds include VAT related transactional data which is refreshed daily, annual Self Assessment returns, and information from third party suppliers via EDI, the internet and CDs. All data used is proportionate and appropriate in tackling the range of risks and issues that HMRC faces, and Connect has strong controls on movement of data.

The IT solution supported major business change. A new structure was created in the Risk & Intelligence directorate which blends operational research, data specialists and frontline expertise, and a Connect Academy was set up to deep-skill analysts over one year.

Connect lies behind the creation of regional profiling centres and multi-disciplinary units, which investigate high-risk sectors, such as scrap metal merchants, and which target specific groups, ranging from gang-masters to high-income individuals. Around 150 analysts work with operational teams to identify specific populations with potential risks. Together they profile cases, review results, modify them in real time and launch investigations to confirm or reject the suspected fraud or error.

Capgemini works with HMRC to enhance Connect. Our support staff also play a key role in Connect operations, working with HMRC analysts to provide light-touch change control updates to risk rules, which helps HMRC counter emerging threats. Further developments will increase the number of data sets, introduce new risking tools, and mine unstructured data, as part of HMRC's toolset to achieve £7 billion more revenue by 2014/15.

## About Capgemini

With more than 130,000 people in over 40 countries, Capgemini is one of the world's foremost providers of consulting, technology and outsourcing services. The Group reported 2013 global revenues of EUR 10.1 billion.

Together with its clients, Capgemini creates and delivers business and technology solutions that fit their needs and drive the results they want. A deeply multicultural organization, Capgemini has developed its own way of working, the Collaborative Business Experience™, and draws on Rightshore®, its worldwide delivery model.

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## Approved by

**HMRC Press Office** **Kenn van Hauen,**  
*Senior Vice President,  
Capgemini*

In collaboration with



**HM Revenue  
& Customs**

HM Revenue & Customs (HMRC) collects tax and duties to make sure money is available to fund the UK's public services and makes payments to over seven million families, providing targeted financial support. Capgemini is HMRC's partner for IT and related services delivered through the Aspire contract. Capgemini is prime contractor for Aspire, and manages key partners and HMRC's Ecosystem of preferred suppliers.

For more information, please visit:  
[www.hmrc.gov.uk](http://www.hmrc.gov.uk)

For more information on this project, please contact:  
[success.story@capgemini.com](mailto:success.story@capgemini.com)