

Real IT Awards

'Working Smarter' Award

National Outsourcing Awards

**Public Sector Outsourcing Project
of the Year**

Civil Service Awards

Innovative Delivery Award

Big Data and Predictive Analytics Help HMRC Process Debt Payments More Quickly

Understanding

**customer behaviour
allows HMRC to
'nudge' higher levels
of payment**

The Situation

HM Revenue & Customs (HMRC), the UK tax authority, has transformed debt management with innovative IT to mass customize debt collection to clear or pursue late payments more quickly. HMRC, along with Capgemini, implemented the flexible analytics-based systems at the heart of process improvement and behavioural insights campaigns that help HMRC safeguard Exchequer cash flow funding for public services.

The Solution

Analytics for DEbtor Profiling and Targeting (ADEPT) is a closed loop 13.5 terabyte big data analytics system, with a debt management system and a decision engine. It automatically combines data from 20 internal and external systems and monitors a wide variety of changes which affect up to a million debts each day. Debt information - such as payments made or missed, records of notes from the field force, and letters returned as undeliverable - is integrated with socio-demographic and other data. ADEPT transforms the data and creates a single source of business intelligence for debt management.

ADEPT can also be used to drive operations and embeds continuous learning and improvement into debt processes. It can evaluate customer response to HMRC interventions and re-calculate behaviour models and risk profiles. The decision rules engine assigns customized sequences of collection interventions to each debt, and the debt management system allocates each case to the relevant channel. By integrating ADEPT's big data approach with legacy batch-processing, HMRC achieves flexibility and speed at the same time as maintaining resilience of business critical systems that thousands of HMRC staff rely on to do their jobs.

The Results

HMRC has replaced conventional debt processing systems with an innovative IT solution capable of mass customizing debt collection interventions based on insights into customer behaviour. Flexible, analytics-based collections have underpinned a key part of HMRC's Debt Management Change Programme, which is well on its way to delivering targeted benefits of over £3billion additional debt collected by March 2015. HMRC has the intelligence, flexibility and speed to agree intervention strategies in days, implement changes at low cost, analyze their effectiveness, and continually improve the success rate of each business activity. Examples include:

- Targeted behavioural economic 'nudge' techniques – reminder letters telling customers that no response is treated as choice rather than oversight doubled payment rates, and mentioning the public services funded by taxation in another letter increased payment rates by 20 per cent.
- Debt cases are allocated to the in-house or external team with the best past performance for customers with similar behaviour and risk profiles – this new placement process generated tens of millions within its first six months, and secured more recoveries through managed payment plans.

Each phase of technology delivery realised benefits, and new debt collection campaigns have *individually* returned ADEPT's development cost many times over in additional debt collected.

How HMRC and Capgemini Work Together

Capgemini accompanied HMRC Debt Management & Banking on their journey to introduce increasingly sophisticated collection strategies. The programme launched with an event where senior business managers explained the debt challenges facing HMRC following the credit crunch. This provided the context for the joint business-IT audience to shape a clear vision of the business model and systems architecture that would be needed to meet this challenge. The shared vision of the future provided a clear reference point for the large, complex and fast-moving programme.

Working closely with HMRC's debt experts, Capgemini ran requirements gathering workshops to support the business case, and designed the systems. Interim solutions were provided for users to test capability, build rules, experiment with different strategies, and measure effectiveness. Business change was aligned with IT change; HMRC ensured managers understood the complexities of the tools.

The programme was delivered in phases to closely manage IT and business change requirements, mitigate risks and ensure value for money.

Phase 1

- *IDMS* – a single collections system was created by migrating former Customs & Excise debts onto the former Inland Revenue system. The newly integrated system provided the workflow needed to generate flexible letters, drive predictive diallers in contact centres, manage door-to-door collectors and carry out legal proceedings through various UK courts.
- *ADEPT Prototype* – clarified business requirements and evaluated alternative architectures for the closed-loop integration of IDMS, ADEPT and a decision engine.

Phase 2

- *ADEPT Infrastructure* – established daily data feeds from IDMS and set up processes to capture the history of changes to taxpayer data. It also created a new support model and technical mechanisms for sharing ownership of different parts of ADEPT between IT and the business.
- *ADEPT analytics and decision engine*
 - A 13.5 terabyte analytical database processes millions of new records each day, and generates event triggers for automated decision-making and updating analytical models based on billions of records.
 - A COTS decision engine tells IDMS what interventions to take for each new debt, based on debtor behaviour and risk profiles.

HMRC working with Capgemini built interfaces between IDMS, ADEPT and the decision engine to deliver a closed-loop system. This monitors the effectiveness of interventions with different customer segments, enables campaigns and provides daily analysis of the activities and outcomes of automated processes for 6,000 IDMS users.

Phase 3 (currently in progress)

- *Predictive modelling* – joins debtor data across all taxes, predicts responsiveness to alternative interventions and contact channels. It also assesses risks of revenue loss.
- *Collection strategy development* – models embedded within the closed-loop process can be updated at any time to improve decision rule effectiveness.
- *Enhanced decision model* – additions to enable a debtor's response or non-response to an intervention triggers re-evaluation of the chosen collection strategy and allows 'next-best' actions to be determined at any stage in the collection lifecycle.

Future phases

- HMRC is planning to introduce new functionality, such as linking ADEPT to other HMRC analytics systems and adding capability to predict payment difficulties.

Project management techniques ranged from traditional waterfall approaches (for IDMS), to iterative agile delivery (for the ADEPT prototype). To industrialize ADEPT, we migrated prototype code into a “test and learn” area and compared outputs of prototype and production code using identical data inputs. Interfaces between multiple components in the closed-loop system were systematically tested, and controlled go-live introduced tax regimes one at a time.

HMRC and Capgemini teams collaborated throughout project delivery into live service. Requirements gathering and high-level design were performed jointly. Detailed design and development were performed separately with regular checkpoints for alignment. Systems integration, testing and deployment were performed jointly. Lead project roles were assigned to HMRC or Capgemini staff, depending on each team’s relative contribution to a deliverable.

Capgemini continues to play a key role following go-live. We implement standard change control for enhancements where there are business critical links between IDMS, ADEPT and the decision engine, and our support staff are part of the HMRC analyst team adding or changing criteria for management information, segmentation analysis, and debt collection strategies to enable campaigns to be agreed and quickly launched.

The project completed on time and to budget, and achieved its business objectives, managing the transformation without disrupting the core functionality that thousands of HMRC staff rely on to do their jobs. HMRC has achieved their strategic vision for flexible, analytics-based collections, and recognises the ADEPT project as a showcase for IT-enabled business innovation delivered with Capgemini.

The success of implementing ADEPT has been recognized externally to both HMRC and Capgemini. At the Real IT Awards the project won the ‘Working Smarter’ Award and was named as runner up ‘Project of the Year’. In addition it won Public Sector Outsourcing Project of the Year at the National Outsourcing Awards and was shortlisted for ‘Big Data Project of the Year’ award at the British Computing Society Awards. HMRC’s Debt Management & Banking campaign team and the Cabinet Office Behavioural Insights team won the Civil Service Innovative Delivery Award for trials testing different wording in tax reminder letters to bring forward payments; they used ADEPT for analysis and segmentation, and to compare the effectiveness of campaigns.

For more information on this project, please contact:
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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

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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.

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www.hmrc.gov.uk