HM Revenue & Customs

Research report

Intelligent Telephony Automation (ITA)

Customer testing

Personal Tax Customer & Strategy Team, HMRC

May 2013

Behavioural Evidence & Insight Team

About Personal Tax Customer & Strategy (PT C&S)

Personal Tax Customer & Strategy works with colleagues in Personal Tax and across HMRC to help develop our approach to implementing the customer centric business strategy. We use customer insight to help PT design, deliver and operate services for individual customers which

- improve customer experience
- maximise tax yield
- ensure that those who need help get the support they need, when they need it

PT C&S also has a corporate role, to manage the relationship with the voluntary and community sector on behalf of HMRC

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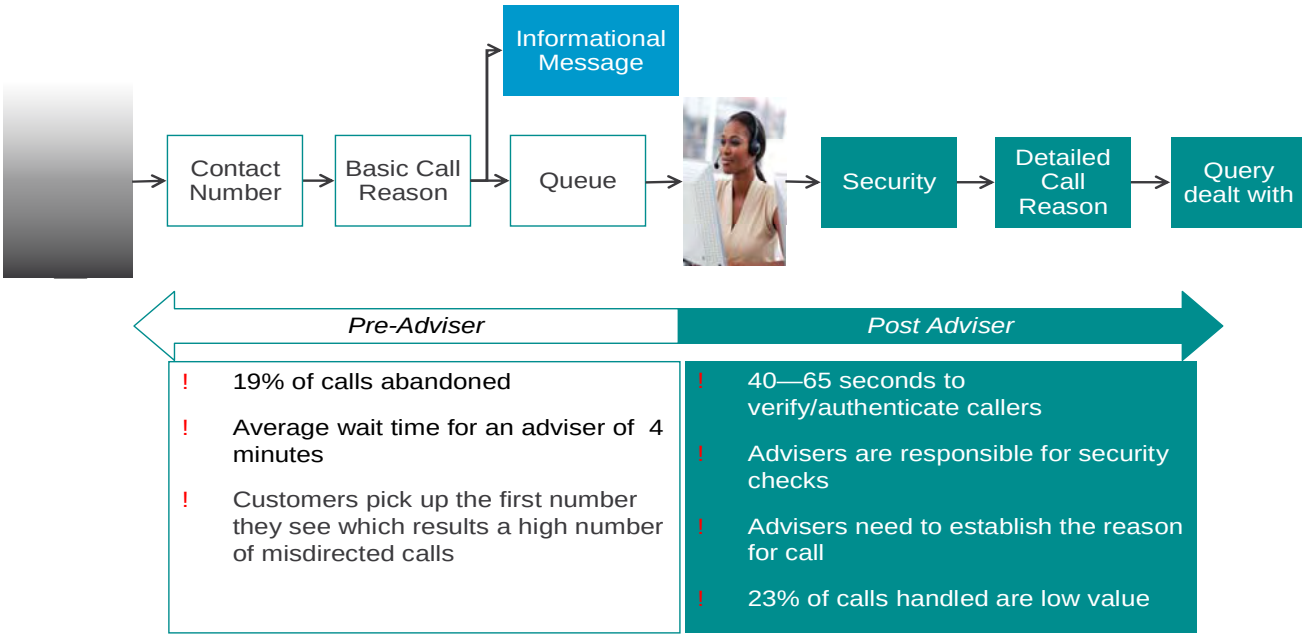
Research requirement (background to the project)

The vast majority of customers who contact HMRC do so by telephone. In 2011 HMRC handled over 58 million calls in its call centres. These ranged from basic enquiries to more complicated queries requiring specialist advice. At present most of the call centre lines are equipped with an Interactive Voice Response (IVR) menu, which asks customers to press a number on their keypad to select an option from the range given. This relies on a customer choosing the correct option to get through to the right place. The menus are long and include a wide range of options, and it can take a significant amount of time for a customer to reach the right adviser.

The process is currently as follows:



In order to handle calls more efficiently HMRC made a business decision to replace some of the existing touchtone IVRs with a new speech recognition technology - Intelligent Telephony Automation (ITA). The overall aims of the ITA system are to:

- reduce call volumes
- improve Call Centre performance by:
  - increasing Call Attempts Handled (CAH)
  - improving and making routing faster
  - shortening the time required to handle an enquiry

- reduce customer demand for the advisers
- provide the capability for customer self-service
- improve the overall customer experience and consequently satisfaction with HMRC call centres, and
- minimise customer need for repetitive contact and reduce 'getting wrong' options.

The ITA system consists of the following elements:

- ***Open Menu:*** which introduces a speech enabled call routing 'How can I help you' approach, allowing the customer to be directed to information specific to their original query without needing to listen to the full range of IVR options. Customers will usually be asked at least two questions before they are put through to either an adviser or a message that answers their question.

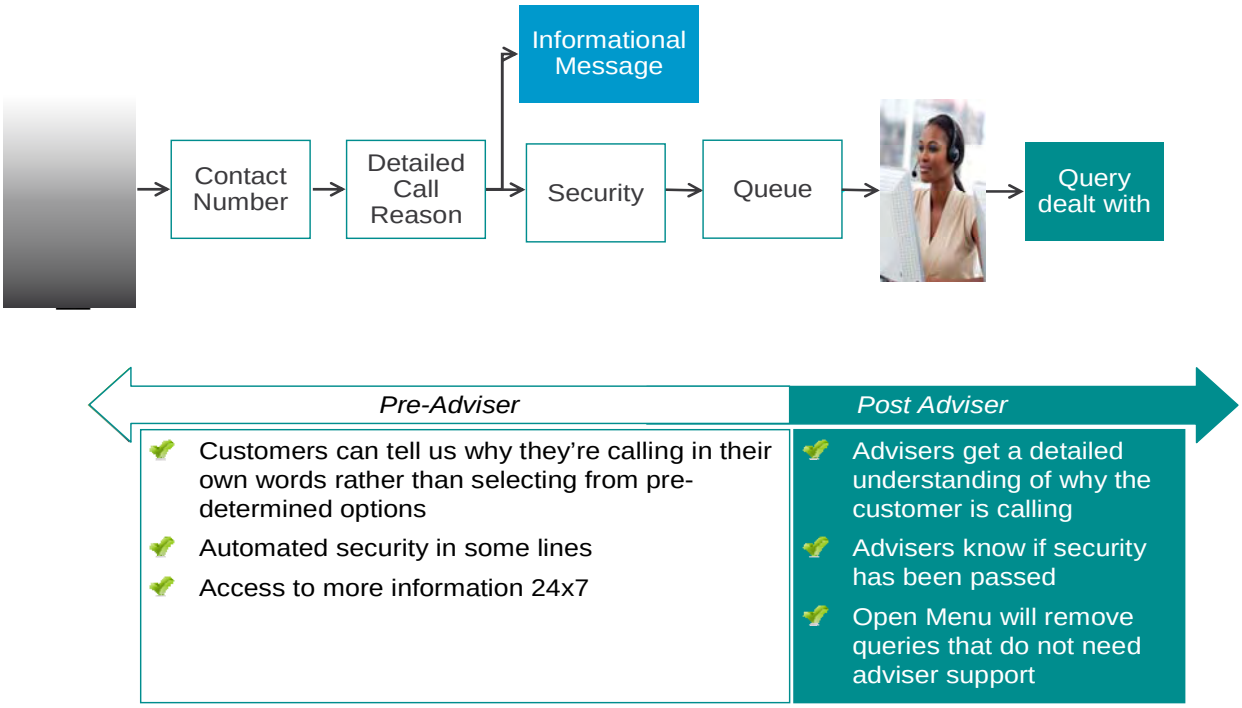
- ***ID&V*** (Identity Verification) provides speech automated security. This automates the existing security process using known facts about the customer to verify a customer's identity and reducing average call handing time. Customers are only taken through the ID&V process where they have a specific query about their account.

HMRC intends to initially implement ITA on the following lines of business:

1. PAYE
2. Self Assessment (SA)
3. VAT
4. Tax Credits
5. Child Benefit
6. Payment Enquiry Line
7. Employer Helpline
8. National Insurance

When implemented, the process will be structured as follows:

Intelligent Telephony Automation – Customer Testing



The ITA system has undergone extensive usability testing in a simulated customer environment by the technical suppliers of the system. However, the ITA system has not been tested with customers in an HMRC environment and consequently it is not known how customers will engage with the technology.

When the research took place

- Omnibus online and face-to-face quantitative research took place during November 2011
- Qualitative research was conducted in two tranches:
  - During November 2012 (PAYE; Self Assessment (SA); VAT; Employer Helpline)
  - During March 2013 (Tax Credits; National Insurance; Child Benefit; Payment Enquiry Line

Who did the work (research agency)

Research was undertaken by TNS BMRB: Andrew Thomas and Caitlin Connors.

Method, Data and Tools used, Sample

The aims of this research were to test the ITA system with HMRC's customers to assess whether they engage with the system, understand what they have to do, are able to navigate the new system and manage the speech-recognition element.

Within these overarching aims there were a number of key questions:

- Do customers understand what they need to do after hearing the opening greeting message?
- Is the language and tone of the opening message pitched at the right level?
- Do customers engage and interact with the Open Menu?
- Are there are any areas of confusion, misunderstanding or ambiguity in the minds of customers when using the ITA system?
- Is the language used in the Open Menu messages understood by customers?
- Do customers fully understand what is expected of them as they go through the menus and do they take the correct action?

The research comprised two strands:

1. Quantitative survey of individuals and SMEs (Small and Medium Enterprises)– designed to assess likely response to the opening message and
2. Qualitative research with individual callers to the contact centre – designed to ascertain in depth the customer's experience of ITA.

1. Quantitative research method

The quantitative research comprised:

- 1005 UK respondents that were interviewed as part of the TNS face-to-face Omnibus survey, with data being weighted to be nationally representative;
- 300 SMEs (Small and Medium Enterprises) interviewed using the TNS Lightspeed Research online panel.

The age profile of the sample of individuals was as follows:

Individuals	
Age	sample size
18-24	n = 177
25-34	n = 174
35-44	n = 134
45-54	n = 155
55-64	n = 135
65+	n = 227

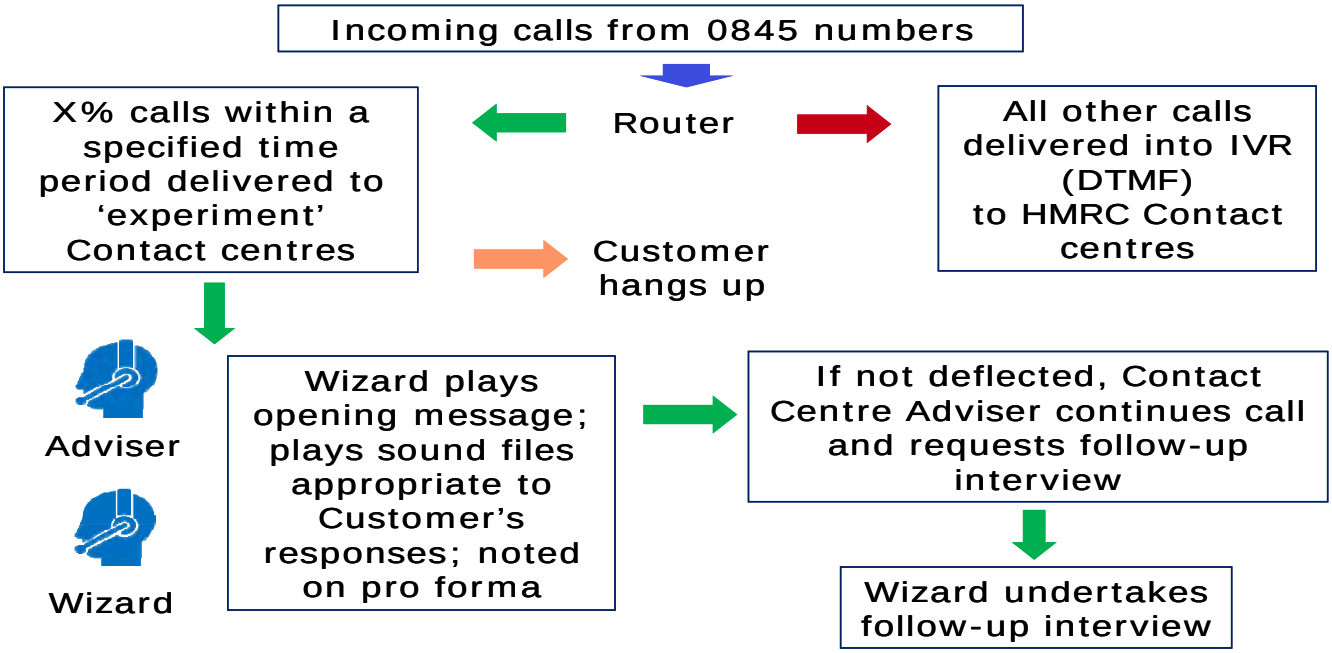
2. Qualitative research method

At the time of the research the ITA was not live. As it was not possible for technical reasons to enable the system for selected lines and time periods, nor was it possible to use a full system off-line, an alternative approach to fully live testing was used for the qualitative research: the 'Wizard of Oz' method.

In the 'Wizard of Oz' methodology, often used in the field of human-computer interaction, a person interacts with a computer system that they believe to be autonomous, but which is actually being operated by an unseen human being (the 'wizard'). In this instance, a small proportion of customers calling the HMRC contact centre thought that they were communicating with a computer using a speech interface; in reality, the participant's words were being entered into the computer by a researcher listening to the call.

During the opening message, callers were alerted to the fact that the call would be recorded for research purposes. If the caller did not hang up or was not deflected by a message that indicated they should consult the HMRC website, the contact centre adviser then picked up the call and took customers through Identity Verification, answered their query and asked if they would be willing to participate in a short, ten minute follow-up call by the researcher.

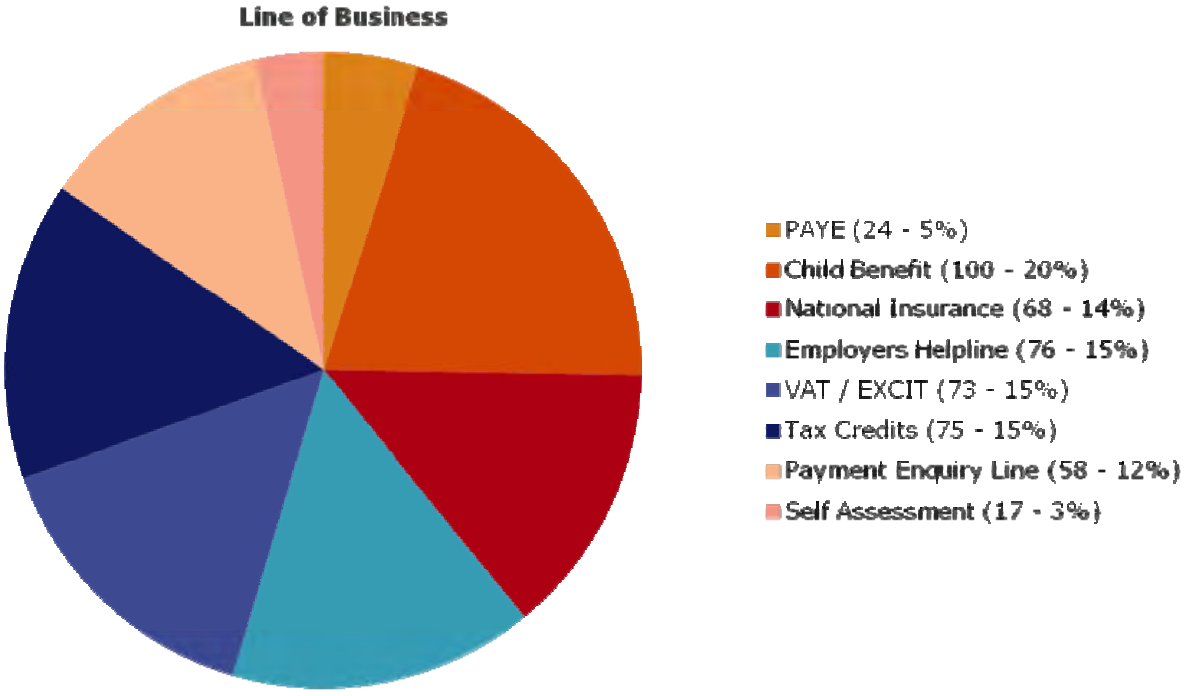
In order to protect customer privacy and confidentiality, the researcher did not hear any of the call once it had been picked up by the adviser. Where the customer agreed to a follow-up call, they were called back by the researcher and their experiences of using the ITA system were discussed. The process involved is shown below:



Of the total daytime and evening calls handled in the qualitative research (491), 121 callers hung up either during or immediately after the opening message; 23 received a 'goodbye' deflection message; and 31 were not offered a follow-up interview either for technical reasons or because they were handed off to another HMRC department. 316 callers were offered a follow-up interview; 113 declined and 32 were unable to be re-contacted. A total of 171 follow-up interviews were conducted.

The high level of hang ups is most likely due to five reasons which may have influenced whether they continued the call: the content of the recorded message may have dealt with their query; callers received a different opening message to that they would usually receive and may have thought that they had dialled an incorrect number; they were alerted to the call being recorded for research purposes; due to technical issues there was a high level of background noise for the first tranche of the research; and due to technical reasons there were sometimes delays before the opening message was played.

A breakdown of caller numbers by line of business is provided below.



Main Findings

Quantitative findings

After being played the introductory message, very few did not understand what they had to do (11% of individuals and 5% of SMEs). After being played a secondary message following the opening message, only 6% of individuals and 3% of SMEs did not know what to do.

Asked how they thought they would respond – hypothetically – to the ITA system, 51% of individuals and 60% of SMEs said that they would briefly describe why they were calling.

13% of individuals (9% SMEs) said they would hang up, 11% of individuals (7% SMEs) said they would ask for an adviser, 9% of individuals (10% SMEs) said they would press a button, 8% of individuals (8% SMEs) said they would stay quiet or wait for another message and 8% of individuals (6% SMEs) said they would do something else.

Qualitative findings

Overall, customers expressed a high level of confidence in using the ITA speech technology. They generally considered their first encounter with the system to be a learning experience and expected that they would not have any problems in the future using ITA technology.

> *"I knew what I wanted to say…easy to use."* (Payment Enquiry Line)

> *"I was a bit taken aback at first. Expected press button options. It took a while to think what to do. But you can freely speak and you're not constrained by lots of options which can be confusing."* (Tax credits)

> *"A lot of other companies do it...it makes my life easier, I can make the call and get the information I need."* (PAYE)

> *"Better than a press button system where you can never quite tell them what you want."* (Employer Helpline)

However, there were some concerns expressed, generally based on experience of using other speech recognition systems and partly concerns about technology generally. These included:

- UK accents not being recognised;
- whether the ITA system would work if there was a lot of background noise;
- foreign languages not being recognised;

- concern for people with speech difficulties; and
- having to speak private information loudly in order for the ITA system to recognise it.

"I was very unhappy. I have a speech difficulty and just wanted to speak to someone straight away." (National Insurance)

"I was struggling how to put things into words as I wasn't expecting it." (Employer Helpline)

"I prefer press buttons, especially if I'm in a noisy place." (Child Benefit)

"I missed the first message because of the children. I wasn't sure what to do then." (Tax credits)

"I wasn't confident that a computer would understand specifics." (VAT)

Customers were asked about the language, tone and speed of the ITA system. With the exception of a couple of English as a Second Language (ESL) caller, the speed was said to be *'just right'*. The tone was described as friendly, clear, professional and efficient and what one would expect from an HMRC automated system. The language was also said to be clear and straightforward.

"It wasn't condescending, it didn't sound particularly automated, it sounded quite natural." (Self Assessment)

"The accent was neutral...it was good, polite." (PAYE)

"Very easy, very clear, voice and content was clear. Voice was more natural than usual." (Tax credits)

In many cases, the ITA system was a new experience for customers and their response to the system was correspondingly different to how they would normally react. Consequently, those who were expecting the usual IVR system sometimes talked over the recorded messages, were interrupted by background noise or thought that they were interacting with a real person and said 'hello, hello'.

Others were a little taken aback by having to express the reason for their call and without a prepared answer either gave a response that lacked detail (such as 'Help', or 'VAT') while others just repeated the same words. A small number of people did not engage with the ITA

system and either stayed silent, pressed buttons as if they were in an IVR system or asked for an adviser.

"I didn't know what to say, so I didn't speak and thought that would get me through to someone quicker." (Child Benefit)

"I just said VAT in the end, mainly these things you just want to get to an operator so I thought that was the quickest way to get through." (VAT)

"I just said 'Agent' and hoped that would get me through faster." (Self Assessment)

"I was feeling desperate to speak to someone so pressed buttons." (National Insurance)

However, as customers indicated, the next time they called HMRC they would be aware of the ITA system and be more prepared to formulate their responses beforehand.

"I was slow in answering because I had to think what to say. I would prefer push buttons. But I guess it will get easier." (Payment Enquiry Line)

"I don't ring HMRC very often but now I know [they use ITA] I will know what to do." (Child Benefit)

"Next time I will know to think ahead." (Employer Helpline)