National Audit Office

REVIEW

A snapshot of the use of Agile delivery in central government

Examples of practices and projects which organisations describe as Agile

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National Audit Office

Contents

Part One
Introduction **4**

Part Two
Leading the Agile agenda in government **7**

Part Three
The characteristics of Agile delivery **9**

Part Four
Central government organisations' approach to Agile delivery **12**

Appendix One
Methods **48**

Appendix Two
Key Agile terms and concepts **53**

Appendix Three
National Audit Office publications focusing on the key components of government ICT **56**

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Part One

Introduction

1.1 The term agile is commonly associated with software development.[1] Publications promoting agile development became particularly prevalent from the 1990s, but it was not until 2001 that a group of software developers summarised the core philosophy behind agile development methodologies. The *Agile Manifesto*[2] lists 12 principles (**Figure 1**) and four key values:

- Individuals and interactions are more important than processes and tools.
- Produce working software in preference to comprehensive documentation.
- Invest time in collaborating instead of negotiating with suppliers.
- Respond to change rather than following a predetermined plan.

Figure 1
Principles behind the *Agile Manifesto*

1 Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.

2 Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.

3 Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.

4 Business people and developers must work together daily throughout the project.

5 Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.

6 The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.

7 Working software is the primary measure of progress.

8 Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.

9 Continuous attention to technical excellence and good design enhances agility.

10 Simplicity – the art of maximising the amount of work not done – is essential.

11 The best architectures, requirements and designs emerge from self-organising teams.

12 At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behaviour accordingly.

Source: www.agilemanifesto.org/principles.html

1 Governments and the private sector have run some major engineering projects in an iterative and incremental way since the late 1950s. For example, the Government of the United States of America's project for the X-15 hypersonic jet is cited as an important example of how iterative and incremental development could be applied to deliver a successful outcome.
2 Available at www.agilemanifesto.org

1.2 The Government intends to use agile in information and communications technology (ICT) procurement and delivery to reduce the risk of project failure.[3] At a hearing of the Committee of Public Accounts in May 2011, it became clear that the Government did not consider agile solely as a method for improving software development. It is also a technique for successful ICT-enabled business change. The then Cabinet Office Permanent Secretary stated that "there is no such thing as an IT project; there are only business projects that involve IT". He also said that trying "to change the whole system nationally on a single day – the so-called 'big bang' implementation – is doomed to failure in almost every situation."[4]

1.3 Consequently in this report we use the term 'Agile' as an umbrella for a group of methodologies that can be used to manage business change projects. The practices in these methodologies are different, but in general Agile delivery teams will develop a project:

- in an iterative and incremental way. In each short phase[5] a delivery team will build part of the system and test it. The delivery team gives priority to areas of high impact or value to the organisation to reduce the risk that it fails to deliver a usable system. At the end of each iteration there is a working product of a quality that the business could deploy and that users[6] can definitely try. User feedback helps the delivery team to improve the functionality in the next and subsequent iterations, identify what more needs to be added to the system and the order of priority; and
- by responding to change. A delivery team can accommodate valid changes to requirements or in technology because the system is built up incrementally.

1.4 The then Cabinet Office Permanent Secretary also told the Committee of Public Accounts that "most IT projects fail because of people, not because of technology."[4] Successful Agile delivery is highly reliant on the right input from people. An Agile delivery team collaborates continually with users through face-to-face communication. It meets the needs of users by delivering working systems early on in the project. The delivery team self-manages, collectively deciding the best way to deliver the work and is self-improving. Team members regularly reflect on how they can become more effective and adapt to maintain and increase the quality of their work.

1.5 This report will be of interest to those in publicly funded bodies who are using or considering Agile delivery. The Department for Work and Pensions is well-known for using some Agile approaches in its projects to introduce welfare reforms, but other central government organisations have been using Agile delivery for a number of years. We identify some common themes in Agile delivery and present a catalogue of central government projects which organisations describe as Agile. We aim to provide practical support for organisations to meet government policy objectives to use Agile delivery to improve public services, including making more of them digital. The case examples highlight some Agile practices that organisations are starting to use.

3 Cabinet Office, *Government ICT Strategy*, March 2011, available at www.cabinetoffice.gov.uk/content/government-ict-strategy/
4 Available at www.publications.parliament.uk/pa/cm201012/cmselect/cmpubacc/c1050-i/c105001.htm
5 A team selects a number of days (typically between five and twenty) to be the length of its iteration and this remains constant throughout the project.
6 A user is an individual who benefits from a product or service. They may not necessarily purchase the product or service.

1.6 In early 2012, we interviewed senior public sector technologists and project managers about their experience of introducing and using Agile methods in their organisations. We also drew on the knowledge of subject matter experts from professional service companies. The organisations were not the subject of National Audit Office audits. We do not conclude on which Agile practices should be used in government. In Appendix One we outline our methods. The key Agile terms and concepts we use in the case examples are listed in Appendix Two.

1.7 This the second in a series of reports on Agile. In our *Governance for Agile delivery*[7] report, we illustrate how private sector organisations have developed their governance processes to make sure Agile projects are successful. Appendix Three shows how these two reports fit in with other National Audit Office publications on government ICT.

7 Available at: www.nao.org.uk/publications/1213/governance_for_agile_delivery.aspx

Part Two

Leading the Agile agenda in government

2.1 The public and private sectors are interested in Agile delivery to help combat the perceived problems with traditional methods for ICT-enabled business change projects. These include:

- low user satisfaction, because people find systems difficult to operate;
- late delivery of systems and failure to realise the expected benefits;
- high costs to make simple system changes; and
- obsolescent systems, because technology changes rapidly.[8]

2.2 In March 2011, the Institute for Government advocated the use of Agile methods for government ICT projects because existing 'best practice' processes cannot deal with systemic flaws in traditional methods. The Institute for Government said it is difficult for government to lock down system requirements at the start and manage delivery against a predetermined timetable because priorities change rapidly and technological development is unpredictable and non-linear. As government has limited experience of using Agile delivery, the Institute for Government suggested that information from Agile pilot projects should be made available widely to allow sharing of the best ideas and lessons learned.

2.3 In the *Government ICT Strategy*,[9] March 2011, the Cabinet Office stated that:

- technology would be considered earlier in the policy-making process and Agile methods would be applied to respond to changing requirements and reduce waste and the risk of project failure; and
- organisations would be prevented from creating large ICT programmes wherever possible and advised to use smaller projects and Agile methods to deliver the right systems and realise the benefits faster.

2.4 In October 2011, government set out its key objectives for Agile in the *Government ICT Strategy – Strategic Implementation Plan.* It will use Agile delivery:

- in half of major ICT-enabled change programmes by April 2013; and
- to reduce the average delivery time for departmental ICT-enabled change programmes by 20 per cent by 2014.[10]

2.5 The *Strategic Implementation Plan* also contained some details on how Agile delivery would be implemented across central government. The Department for Work and Pensions has lead responsibility for the implementation of Agile delivery and it will make sure that departments:

- receive advice and support through an online community;
- have access to small- and medium-sized enterprises that provide relevant Agile services;
- use Agile delivery methods on projects when appropriate; and
- measure and benchmark the outcomes from those projects.

8 Institute for Government, *System Error: Fixing the flaws of government IT*, March 2011, available at www.instituteforgovernment.org.uk/publications/system-error
9 Cabinet Office, *Government ICT Strategy*, March 2011, available at www.cabinetoffice.gov.uk/content/government-ict-strategy/
10 HM Government, *Government ICT Strategy – Strategic Implementation Plan*, October 2011, available at http://ctpr.org/wp-content/uploads/2011/11/govt-ict-sip.pdf

2.6 To deliver government's objectives the Department for Work and Pensions has established a steering group, comprising senior technology, business and programme managers from 13 central government organisations.[11] This Virtual Agile User Group meets monthly to share knowledge, expertise and approaches to help departments deliver and become Agile.

2.7 The Department for Work and Pensions has established a cross-government Agile community, supported by a website built by the Government Digital Service, which went live in May 2012.[12] The site is for people in the public and private sectors to discuss and share experiences. As well as there being experts on hand to answer queries on Agile, the Department for Work and Pensions has provided resources such as an 'Agile cookbook' (recipes for getting started in different circumstances) and an Agile adoption strategy (how to build organisational support for Agile).

2.8 Agile practitioners from the Government Digital Service work with other government organisations to develop ICT and digital solutions using Agile methods. Where projects are between three weeks and three months in length, the Government Digital Service has helped organisations contract with small- and medium-sized enterprises for agile development. The first project of this kind was the alpha.gov.uk website prototype.

2.9 The Government Digital Service also hosts a monthly 'Agile Tea Camp'. This is an informal meeting that provides opportunities for people who are interested in Agile to get together with others from the public or private sectors who use Agile methods.

11 Companies House; Department for Business, Innovation and Skills; Department for Transport; Department of Health; Driver and Vehicle Licensing Agency; Driving Standards Agency; Government Digital Service; HM Revenue & Customs; Highways Agency; Home Office; Maritime and Coastguard Agency; Ministry of Defence; and Vehicle and Operator Standards Agency.

12 Available at: http://agile.civilservice.gov.uk/

Part Three

The characteristics of Agile delivery

3.1 Few central government organisations have deep experience in using Agile methods. There are individuals however, who have acquired skills for Agile delivery from other sectors. This report is designed to facilitate learning and information sharing across organisations.

3.2 From our review of the literature on the characteristics of Agile methodologies we produced a word cloud to help understand what Agile delivery offers teams undertaking business change projects. The words that appeared more frequently in the source text have greater prominence in the cloud in **Figure 2**.

3.3 Subject-matter experts in professional services companies to whom we spoke place significant emphasis on the right team skills and dynamic, rather than just the use of commercial Agile methodologies and tools. For them, successful Agile delivery depends on the participants understanding the value the business change will bring and behaving in a way that delivers the most beneficial functionality or systems quickly.

3.4 Using our literature review and the discussions with the private sector, we developed five characteristics for Agile delivery in central government, which the cross-government Virtual Agile User Group (paragraph 2.6) agrees should be typical of Agile delivery. These characteristics are:

- citizens and business are at the heart of delivery;
- a service or business change is delivered quickly and continuously improved;
- a full service is built from small independently usable releases;
- the team is responsible for making decisions rapidly; and
- the team continually redirects resources to maximise the value it delivers.

Figure 2
Key characteristics of Agile delivery

Source: National Audit Office review of literature

3.5 In Appendix One we list some actions and behaviours that should provide evidence that organisations are demonstrating the characteristics of Agile delivery. These actions and behaviours are not a set of criteria that organisations must display from the outset; rather they help build a picture of Agile practices for government.

3.6 Senior technologists and representatives of delivery teams in central government told us about the practices they were using in their Agile projects. **Figure 3** shows the government organisations that thought that they had examples of Agile practices that they could share with others in any of the five characteristics identified in paragraph 3.4. As government becomes more experienced and confident with Agile delivery, organisations should demonstrate more of these characteristics.

Figure 3
Areas of Agile where project delivery teams have experience to share with others

Citizens and business at the heart of delivery	Service or business change is delivered quickly and continuously improved	Full service is built from small independently usable releases	Team is responsible for making decisions rapidly	Team continually redirects resources to maximise the value it delivers
Companies House	Companies House	Government Digital Service	Companies House	Companies House
Department of Energy and Climate Change	Department of Energy and Climate Change	Health and Social Care Information Centre	Department for Transport and its Agencies	Department of Health
Department for Transport and its Agencies	Department of Health	Ordnance Survey	Department of Health	Government Digital Service
Government Digital Service	Government Digital Service	Technology Strategy Board	Government Digital Service	Health and Social Care Information Centre
Health and Social Care Information Centre	Intellectual Property Office		Health and Social Care Information Centre	Office for National Statistics
Intellectual Property Office	Ordnance Survey		Intellectual Property Office	Ordnance Survey
Ordnance Survey			Office for National Statistics	Technology Strategy Board
			Ordnance Survey	

Source: National Audit Office interviews

Common themes

3.7 We also asked the senior technologists and representatives of delivery teams in government about their experiences of introducing Agile practices. Ten points were most frequently mentioned in our interviews:

- The circumstances were right for Agile methods to be introduced: project delivery was perceived as poor and senior management needed to make significant savings. The action in the Government ICT Strategy for each department to run a pilot project using an Agile approach also contributed.
- Changing organisational culture was difficult. It was easier for staff to introduce Agile practices and behaviours in small project teams. This is partly explained by the fact that the suggestion for Agile delivery mostly came from the developers in the ICT department or suppliers, who are the core members of the small project teams.
- It was more problematical to build the full service from small independently useable releases. Suppliers of outsourced IT services set dates when a release could be made, typically every quarter or half year, limiting the frequency with which organisations could make releases into live systems. Other difficulties arose when organisations were building services that were linked to those in other organisations, so releases could not be made without advance warning.
- Regardless of whether the impetus for Agile delivery came from senior management, the ICT supplier or the in-house developers, once project teams had experience, they wanted the organisation to adopt Agile delivery throughout.
- Successful pilot projects were one of the best ways to persuade the rest of the organisation that Agile methods are effective to deliver and roll out products and services.
- Teams adopted and adapted Agile practices from those recognised methodologies that suited the project and the culture of the organisation. There was no single recognised Agile methodology[13] being used across government.
- Specialist resources, such as Agile coaches and developers, were important to support the introduction and maintain the use of Agile methods. Small- and medium-sized enterprises were playing an important role.
- Organisational culture was a help and a hindrance to the implementation of Agile delivery. Staff who were new to the public sector, used to responding quickly to the changing environment or who were employed in organisations that were recently created were viewed as an asset when introducing new Agile ways of working. The process for obtaining funding and the tradition of applying strong control from the centre of organisations were not seen as being well-aligned with Agile delivery.
- The role of the business owner needed to be well-defined and senior management needed a clear understanding of staff's time commitment if they were to be successful in this position.
- Methods for gauging success in implementing Agile delivery in organisations were rare.

13 For example Scrum, Dynamic System Development Method, Extreme Programming, Lean Development and Crystal.

Part Four

Central government organisations' approach to Agile delivery

4.1 In this section we illustrate how some central government organisations are implementing Agile delivery. We collected this information on two levels.

4.2 First, we asked for high-level data on business change projects being run using Agile methods. Sixteen central government organisations responded to our request. **Figure 4** (pages 40–47) provides a snapshot of the purpose, cost, start date and duration, time to deliver the first live release, team size and performance metrics for 33 Agile delivery projects as at 31 May 2012. Many of these projects are at an early stage.

4.3 We have not confirmed that the projects are being run using Agile methods nor have we audited the data to provide any assurance to management or assess value for money. There are other organisations which report they run Agile delivery projects.

4.4 Second, we interviewed senior technologists and project managers about their use of Agile methods, including the rationale for using an Agile approach, how they are measuring success, staff skills and expertise and which Agile tools they are using. Fourteen organisations were at a mature stage in their implementation of Agile delivery and we have prepared 12 case examples to provide some more detailed information on their experience of implementing Agile:

- Cabinet Office (page 13).
- Companies House (page 15).
- Department for Transport and its Agencies (page 18).
- Department for Work and Pensions (page 20).
- Department of Energy and Climate Change (page 22).
- Department of Health (page 24).
- Health and Social Care Information Centre (page 26).
- Intellectual Property Office (page 29).
- Ministry of Defence (page 31).
- Office for National Statistics (page 33).
- Office of the Public Guardian (page 35).
- Technology Strategy Board (page 37).

Cabinet Office

Agile projects

- Electoral Registration Transformation Programme (the digital design and delivery project)
- G-Cloud Programme
- Government Procurement Service website

Rationale for Agile approach

The digital design and delivery project team in the Electoral Registration Transformation Programme (ERTP) chose an agile development strategy because it needs to have flexibility to implement the digital requirements of Individual Electoral Registration while primary and secondary legislation is being passed.

The delivery team for the Cloudstore[14] told us it was not possible to define exactly what form the online marketplace for cloud ICT services should take. The delivery team felt that using Agile practices such as testing early versions with users would help them deliver a better service.

The Cabinet Office published the *Government ICT Strategy* and project teams want to comply with the action for government to use a more Agile approach.

Measures of success

The ERTP digital design and delivery project team evaluates progress by measuring the time taken to deliver requirements (user stories) and the frequency of service updates (releases). During the alpha phase of its project the team tested whether the project was delivering what was required through feedback from weekly 'show and tell' sessions with business users.

Persuasion process

To gain initial support and funding, the ERTP digital design and delivery project team worked with stakeholders to model the scope of the system by identifying high-level requirements. The team then delivered a prototype of the live system in eight weeks to demonstrate to senior business executives the benefits of using Agile methods. The team told us that the executives were pleased with the process and the results and it will continue to use an Agile approach through the entire project.

For the other projects, Agile was the default delivery method, so no persuasion was necessary.

Staff skills and expertise

The project teams reported that only a few of the Department's staff have previous experience of using Agile methods. It is using Agile service suppliers and experts from the Government Digital Service to help deliver the projects. The project teams told us that they are ensuring that skills are being transferred from the experts to the team through on the job training. They thought that the Department would want its own staff to take over the business owner role from the Government Digital Service in the future.

14 An online catalogue of ICT services which is available to the public sector.

Agile tools and methods being used

The Department uses online collaborative tools and Agile project management and issue tracker software.

Supplier partners

The Government Digital Service has helped the project teams to select small- and medium-sized enterprises to supply Agile services for the projects. The ERTP digital design and delivery project team used the pan-government Sprint 2 framework and are paying the specialist organisation for time and materials. The Government Procurement Service website team let a traditional contract with milestones and two staged payments; the first after the design and prototype stage, and the second on completion of the project.

Lessons learned

The ERTP digital design and delivery project team found that its ability to make quick decisions was slowed down when members were not co-located. While staff were sitting together communication improved and the team made quicker progress. Project teams think Agile delivery provides a structured way to work with suppliers. They told us that they found that when suppliers delivered outputs often, they could better control the quality to meet expectations.

Challenges

The project teams told us that staff's mind set needs to change because the structure for managing Agile delivery, unlike traditional methods, is not prescribed. They felt that the time taken by various stakeholders outside the project to make policy or programme decisions also caused delays, making an Agile approach more difficult.

Enablers

The ERTP digital design and delivery project team reported that the trust established between multidisciplinary team members from the Department, the Government Digital Service and the supplier has helped them become effective and efficient. The project team considers that access to the expert resources in the Government Digital Service has helped it deliver results quickly.

The Government stated that project teams should use an 'iterative' approach and the Government Digital Service has a high profile. The teams believed that this situation has helped them gain senior support for their projects.

Examples of Agile practices

The Government Procurement Service website team worked with users to define the most important requirements, which the supplier documented quickly and clearly. The team then worked on a small number of business needs in each iteration. It delivers working solutions every two weeks to ensure a complete version of the website will be delivered rapidly. The team is developing functional specifications and using open source software, which means the Department is not tied to one supplier.

Companies House

Agile projects

- Case management
- Joint registration system
- Dormant subsidiary exemptions system
- E90
- Charges reform update

Rationale for Agile approach

In 2008-09, Companies House was having difficulties in implementing its change programme resulting from the 2006 Companies Act. The amount of analysis it needed to do upfront had caused timescales to slip and even with this detailed planning, the teams often re-worked the code. The software developers and their senior manager wanted to find an approach to improve delivery by Companies House and make sure that the users got the right solution.

Measures of success

The IT Department believes that Companies House strives to continuously improve its approach to Agile and implementation of Agile principles has already led to internal metrics demonstrating better performance. The IT Department told us that project teams' defect rates have reduced considerably – from a previous high of around thirty per cent to less than five per cent and often with zero 'critical' defects. Also the code can be used in live systems more quickly bringing financial savings and wider business benefits. Another indicator of success is feedback from the users and developers. The IT Department informed us that comments from the business on its satisfaction on projects were very positively worded, for example directors in another government department, which was involved in a joint project with Companies House, were impressed that it was able to absorb last minute changes in requirements. Also a recent staff survey revealed that staff morale had increased and turnover in the development team reduced, with no developers leaving in the past two years.

Persuasion process

In the first instance Companies House implemented what it described as an 'agilesque' project. After this had gone live, the IT senior management team agreed to run a small-scale but true Agile pilot project. Companies House reported that, while development teams were eager to use Agile delivery, IT support teams were more resistant. The support teams feared that they would not receive proper documentation on the software, which would make it difficult for them to support the systems once they became operational. The development teams found that as the pilot project progressed, Agile methods became more popular with the business. They reported staff liked the fact that they had greater involvement in designing and deciding on the functionality and the improved match between what they required and what the IT Department delivered.

Companies House reported that in 2010, with the help of a specialist supplier, the IT Department made presentations to senior management and business users. The IT Department felt that the main advantage for the business was that it would be a partner in projects and could help drive the change itself. They told us they emphasised how Agile delivery could combat some of the problems associated with previous 'waterfall' projects. The Operational Board debated and agreed the adoption of Agile methods following very positive feedback.

Staff skills and expertise

Initially the IT Department used its specialist supplier to run an Agile project management course for around 25 staff. It reported that it also contracted an Agile coach to help instil Agile practices and maintain momentum. The IT department believed that by using this approach a structured introduction of the techniques would be achieved, together with a common understanding for staff. Although no further formal training was provided, Companies House has run awareness sessions for all those likely to be involved in an Agile project. The IT Department felt that this was an important reminder for the developers and a good opportunity for members of staff from the wider business to familiarise themselves with Agile practices, concepts and terminology. The IT Department thought that 'show and tell' sessions have been useful in increasing business staff's experience with Agile methods, which has encouraged them to become more involved in stand-up meetings.

Agile tools and methods being used

The teams use Scrum.

Lessons learned

The IT Department believes that it would have been easier to implement Agile delivery if it had had a champion from the business. Companies House has recently revised its approach to 'show and tell' to make it more manageable for the developers to present an output to large numbers of stakeholders. The demonstration session is divided up into half-hour slots so that similar stakeholders can attend together and provide feedback from which decisions can actually be made.

The IT Department recommends organisations keep their retrospectives fresh and vibrant by regularly amending their format or trying different feedback tools to prevent teams from getting stale. Also, that organisations train and develop individuals to be coaches who then enthuse others, maintain motivation and encourage their organisation to continually remove blockers and improve the processes and practices used.

Challenges

The IT Department believes that the terminology and language of Agile methods can be off-putting for business staff. It has tended to concentrate on showing people that they actually already follow Agile practices. The IT Department also found establishing a single business owner role difficult. Staff in Companies House are used to achieving consensus, so the developers have not always got decisions made as quickly as they would have liked. The IT Department reported that it was hard to get the project management community to accept Agile delivery because of the changes to its role and uncertainty about appropriate performance measures.

Enablers

The IT Department considers that the successful implementation of Agile delivery is due to the development team driving its introduction together with senior management's support, rather than management imposing the idea on the developers. The enthusiasm of the developers and the fact that all IT staff can be accommodated on the same floor in the building has helped. Prior to the IT Department using Agile delivery, a couple of projects run using waterfall methods had not met user expectations, so staff in the business were willing to consider an alternative approach.

Contractors who had used Agile delivery were valuable in convincing other staff of its benefits.

Examples of Agile practices

An enterprise architect is part of the Agile delivery team from the outset. Companies House considers that this practice is useful to minimise ‘big picture’ technical debt.

On the visual displays (whiteboards) the three main scrum teams use ‘avatars’ to depict the person working on a particular user story.

Companies House has used a customer feedback facility on new screens on its website. This has enabled the developers to respond to comments within one day and make improvements to newly developed services.

In their retrospectives teams challenge management to remove blockers that inhibit good practice.

Department for Transport and its Agencies

Agile projects

- Modernising the infrastructure for the MOT (Vehicle and Operator Services Agency)
- Modernising the Internet Booking System (Driving Standards Agency)
- Modernising HM Coastguard (Maritime and Coastguard Agency)

Rationale for Agile approach

In addition to the need to comply with the Government ICT Strategy, there were three main catalysts for the Department and its Agencies in deciding to use an Agile approach:

- The Chief Information Officers (CIOs) have to introduce changes to reduce costs and improve services to citizens, businesses and staff. They felt they needed alternative working practices to meet savings targets.
- The CIOs wanted to be able to deliver systems earlier and then evolve their ICT solutions to more closely meet user needs, rather than attempting to define all requirements in full before starting development, as is traditional.
- The Driver and Vehicle Licensing Agency reported that by using an Agile approach it had reduced its overall delivery time to redevelop an online service by 30 per cent when compared to earlier projects.

Measures of success

In the pilot projects the Department and its Agencies plan to measure against historical programme and project timescale data, as well as other quality metrics. For example, the number of first release faults for new software and user satisfaction.

In addition the Highways Agency is analysing existing data to help the Department and its Agencies develop models to identify efficiencies and business value. The Department and its Agencies consider that these models will provide further information on tracking, reporting and responding to quality metrics.

Persuasion process

The Department and its Agencies describe Agile as a new way of working. Senior management approved the Agile principle to deliver a service that has all the features required to be valuable to the users and no more, but is produced with the least effort. The Department and its Agencies told us that some staff, particularly those on the front-line, are used to being flexible and responding to changes. An Agile approach has therefore been an intuitive way for them to work.

Staff skills and expertise

The Transport Learning Group provides a course for agile development. In addition it is delivering sessions that are broader in content because Agile methods also potentially support other business change activities. Staff in delivery teams in the Driving Standards Agency and Driving and Vehicle Licensing Agency are participating in Agile awareness training.

The delivery teams of the Maritime and Coastguard Agency have attended a three-day Agile practitioner course. The executive and non-executive directors, senior managers and programme management teams have also received an overview of Agile.

Senior ICT management and key stakeholders across the Highways Agency have participated in sessions to look for opportunities to combine Agile, project and programme management and Lean initiatives to realise greater benefits.

Assurance and audit staff are working closely with delivery teams to ensure that the governance is appropriate for the pilots, recognising that the current processes may need to be adapted for projects using an Agile approach.

Agile tools and methods being used

The Driving Standards Agency is following the Scrum methodology with fixed-length sprints, each preceded by time-boxed planning meetings.

Supplier partners

A professional services company has supported the Department and its Agencies with training and education. The outsourced ICT service providers of the Driving Standards Agency and the Vehicle and Operator Services Agency are supporting the technical delivery of Agile.

Challenges

The Department and its Agencies are finding that the Agile approach requires greater collaboration as well as more focus on outcomes. As a consequence, there is tension between current governance requirements for documentation, approvals processes and contractual vehicles, and how Agile projects should be executed.

Enablers

The Department and its Agencies consider that their organisational cultures are a help in introducing Agile. Staff have years of experience of using technology for business. They are used to considering citizens' and the private sector's needs when developing services, so their attitude towards the new Agile way of working has been positive.

Examples of Agile practices

The Maritime and Coastguard Agency programme team has broken its overall requirement up into small deliverables and has been able to provide a number of usable services very quickly. For example, it developed and launched the new website for the modernisation programme in two weeks and secured a purpose built emergency response building from the Department for Communities and Local Government to be the new national control room.

The team has estimated the effort required to complete each deliverable and it advertises for operational staff to volunteer to work on these projects via the Agency's intranet. These staff are released by their senior managers to work solely on the project up to a maximum of one month.

Department for Work and Pensions

Agile projects

- Universal Credit
- Personal Independence Payment

Rationale for Agile approach

New policy initiatives provided the Department with an ideal opportunity to use an Agile approach. Senior managers recommended that Agile methods should be implemented across the Department. Corporate IT staff reported that by using an Agile approach the Department hoped to avoid a 'big bang' delivery and reduce the time to implement Universal Credit and Personal Independence Payments. The Department felt that an Agile approach, rather than the traditional waterfall approach, would give it a better chance to deliver the new services to challenging timescales and targets.

Another reason given for using Agile delivery was the potential to provide operational agility. Corporate IT staff believe that after the initial launch, they will be able to easily change the services in response to feedback from users. Overall the Department is using Agile delivery to minimise development and maintenance costs.

Staff skills and expertise

Corporate IT staff reported that all the delivery teams have attended Agile training courses.

Agile tools and methods being used

The Universal Credit delivery team told us that it is using Agile methods to design and deliver business and IT solutions. The Department uses a wiki-based tool to track requirements and story points and burndown charts to track progress.

Supplier partners

The Department has used a professional services company to provide on going coaching for teams and facilitate Agile delivery, and brought in major suppliers to deliver the ICT systems.

Lessons learned

The Universal Credit delivery team found that co-locating staff is critical if good progress is to be made. Also other organisations should not underestimate the cost of communication, in terms of the effect of doing it badly, and the cost of doing it well. The Universal Credit delivery team believe with hindsight that it put too many technical, organisational and commercial constraints at the beginning of the programme, which has affected its ability to deliver.

The Department told us that it was applying the learning from the Universal Credit project in other Agile deliveries, where lessons were appropriate.

The Personal Independence Payment delivery team found that increasing the number of attendees at business owner workshops slowed the decision-making process. It considers it made productivity gains by setting up small 'hit squads' of business and corporate IT representatives to focus on specific areas.

The Department is considering identifying components of the Personal Independence Payment project that are on the non-critical path, so that changes to the Agile methodology can be trialled at a smaller scale. If successful these methods will be adopted on larger aspects of the project.

Challenges

The Department reported that previously instilled behaviours meant, for example, that although members of the delivery teams had been empowered to make decisions, they initially still felt they needed to defer decision-making to more senior staff. The Department believes that the teams struggled to behave effectively in an Agile way until it provided them with appropriate tools and their knowledge and awareness grew.

The Personal Independence Payment delivery team had to make a large number of assumptions early on because consultations on the legislation were not complete. It considers therefore that there was a temptation to press on with developing the easier requirements. While allowing progress to be made, this has resulted in some complex functionality being left to the later stages.

Enablers

Corporate IT said that departmental staff had an appetite to try a different approach to project delivery. The Personal Independence Payment delivery team told us that finding the right set of business owners, who could make key decisions as well as understanding the detailed processes, was crucial.

Examples of Agile practices

The delivery teams use kanban boards to facilitate communication and track progress. Senior management use the boards to monitor project scope. The Department encourages product owners to follow the work from inception to delivery.

To manage change control the Personal Independence Payment delivery team established a design steering group, comprising senior business representatives, to fast-track decisions from workshops. It also takes functionality requirements into development as soon as they are ready from the workshops, thereby removing the need for one massive release of all the outputs at the end of the project.

Department of Energy and Climate Change

Agile projects

- Quarterly Fuel Index
- Domestic Fuel Index

Rationale for Agile approach

Teams have been using Agile methods since they were in the Department for Trade and Industry. From this initial experience the Department of Energy and Climate Change (formed in April 2009) realised that Agile was an effective delivery method and used it on projects for a case handling system and human resource database. It continues to use Agile methods for application development because of their track record in reducing costs and timescales and improving the user experience.

Measures of success

The Department deems Agile projects successful if they meet the business need; delivery timescales and costs are reduced; and customers are satisfied with the end product and their user experience is enhanced.

Staff skills and expertise

On the Quarterly Fuel Index project the Departmental project manager/ business owner had previous experience of Agile delivery in other parts of government. The rest of the delivery team were from a specialist supplier of Agile services.

Agile tools and methods being used

The Department uses the Rapid Application Development methodology. It uses tools that allow the developers to mock up screens to share with the users throughout the project and to track defects and enhancements.

Supplier partners

The Department usually works with specialist small- and medium-sized enterprises to deliver its Agile projects. The supplier has a capped time and materials contract, so modifications to the delivery requirements can be made provided they do not exceed the overall budget.

Lessons learned

The Department considers that the team and how it works together is an important factor in Agile delivery. The supplier is a part of the team. Flexibility and trust between all parties is essential if Agile working is to be successful. The Department believes that targeted training in Agile techniques for Departmental IT project management leads will encourage them to work more closely with suppliers.

Enablers

The IT team considers that previously successful outcomes from using Agile methods, along with demonstrable cost savings, are important in securing support for Agile methods across the Department.

The team reported that having an experienced supplier and open source workflow software was central to successful delivery of the Quarterly Fuel Index project.

Examples of Agile practices

The development team shared prototypes and screens with the customer early to ensure that they were meeting the requirements. This close relationship with the customer enabled the team to correct any misinterpretations of the requirement and find better ways to develop the functionality during the development process.

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Department of Health

Agile projects

- Spine 2

Rationale for Agile approach

The Department has chosen to use an Agile approach to deliver Spine 2, a replacement infrastructure project, because it allows on going development to meet emerging requirements. This was the idea of an internal team, which has been using Agile delivery on projects for over two years. The Department expects to:

- reduce the cost of the project through the automation of the test and deployment cycle;
- reduce the risk of implementation by deferring less important work until users need that functionality, so reducing the number of items being worked on at any one time;
- reduce the up-front investment to explore new ideas and introduce new capabilities by getting user feedback early on; and
- increase the frequency of releases into a live environment. Each one will have fewer degrees of change and continuity of service will be easier to ensure.

Measures of success

The Department still has work to do to define what 'done' looks like, but the key criteria is having a working solution that can replace the current service, within the current contract and ideally within the agreed budget. The solution must be compatible with external systems and not affect them adversely.

Persuasion process

The programme manager and the wider team invested time in persuading senior members of the Department that Agile delivery would be beneficial. A proof of concept was created by two teams of developers. They delivered ten per cent of Spine 1 functionality and dealt with 40 per cent of the technical risk after 12 weeks. The Department found that this was a convincing demonstration of the effectiveness of using an Agile approach. Based on the proof of concept, the project team estimated that it needed 5,000 man days of effort to replicate Spine 1 functionality, as well as providing extra features, compared to the supplier estimate of 15,000 man years.

Staff skills and expertise

Eight people in the Department have experience of Agile delivery. Two of the four people in the Spine 2 team have used an Agile approach before. The Department is procuring additional development skills from an Agile services supplier through the G-Cloud framework.

The Department does not provide formal Agile delivery training. Two experienced members of the team act as coaches to transfer knowledge and to assess, readjust and improve Agile practices carried out by the team.

The Department recognises the need to build its internal capability in the longer term and make development a viable career option.

Agile tools and methods being used

The team prefers Scrum and has chosen elements of this methodology to manage the Spine 2 project. It is also using pair programming; test-driven development and principles from Lean manufacturing (genchi genbutsu).

Supplier partners

The Department is engaging an external supplier to improve the team's skills and approach, and provide resources for software development. It is likely to use short-term contracts of three months and, in contrast to the outsourcing arrangements for Spine 1, it will not transfer delivery risk to the supplier. The Department intends to have several suppliers available to partner with the team, so that if any supplier is not performing satisfactorily it can be replaced at the end of a sprint.

Lessons learned

This project is only at an inception stage. However, the team told us it has found it is beneficial to use framework contracts to speed up supplier procurement.

The Department considers that a good Agile delivery team: discusses requirements, progress, and issues transparently; collaborates without being told; does not discard quality controls even when under intense pressure to deliver; and is collocated.

Barriers

The Department has used more traditional (waterfall) programme management for eight years. The norm is for teams to fully explore all risks and try to mitigate them before starting a project. The team found the approval process for project funding made it difficult to initiate the project quickly. The Department is looking to identify new ways of working which are consistent with Agile principles and spending guidelines.

Enablers

The Department considers that the development teams have been enthusiastic about working differently and executive board members have encouraged an Agile approach.

Examples of Agile practices

Teams use burndown charts to track the work backlog at the end of each day and to measure how effective they are working and whether the project is on schedule. The project manager translates this information into reports to satisfy the governance requirements of the wider organisation and shields the development team from external pressures.

Health and Social Care Information Centre

Agile projects

- Healthchecks
- Patient Reported Outcomes Measures
- Clinical Audit Transition
- Diagnostic Imaging Dataset
- Calculating Quality Reporting Service

Rationale for Agile approach

The software developers took the initiative to introduce Agile methods to the Information Centre, prior to the publication of the Government ICT Strategy. The IT Development function wanted to:

- deliver system functionality early so that products were not out of date by the time they were released;
- be able to evolve an ICT system so that they could be responsive to changes from the business, meet its expectations and improve satisfaction;
- identify and make very visible the challenges facing the IT development teams; and
- eliminate waste in their own development processes.

Measures of success

The IT Development function has designed an Agile delivery dashboard through which it reports and tracks progress on iterations and releases. It uses metrics to measure its adoption of a more Agile approach. It monitors the number of projects with:

- iteration cycles;
- user stories;
- test-driven development;
- acceptance testing within iterations; and
- continuous integration.

To measure how widespread the adoption of Agile methods is in the organisation, the IT Development function measures the number of projects:

- with a product owner from the business;
- where a product owner is responsible for the backlog;
- where the product backlog is the single source of requirements; and
- with continuous release planning.

The Information Centre is also measuring user satisfaction, the time to market and the quality of the software and systems.

Persuasion process

The IT Development function had to convince the business that it was worth investing time and effort in the new approach. It believes that its early successes with Agile projects helped. Changing the Information Centre from using traditional methods for software development to a more Agile approach has been a gradual process. For example, the IT Development function reported that the responsibilities of the business owners were not defined and agreed up front, instead they emerged as projects progressed. The IT Development function believes that the Information Centre is now familiar with Agile methods and the successes that they bring, so product owners accept that this is how the organisation works.

Staff skills and expertise

The IT Development function has grown from a handful of people to 50 developers in two years. The Information Centre has achieved this by recruiting skilled contractors. The IT Development function considers that its seven teams are mature in their adoption of Agile practices because the individuals have such strong knowledge and experience.

The Information Centre provided existing project management staff with training and mentoring so that they were able to take on the role of Scrum master. Business stakeholders also needed coaching to be able to communicate effectively to the business about the value of the product or system as opposed to its technical value.

Agile tools and methods being used

The IT Development function has produced an 'Agile Development Framework' which draws on a number of Agile methods, including some aspects of Scrum, which have proved successful in the Information Centre in the past.

Supplier partners

Recently the IT Development function has developed an 'Agile Outsourcing Framework' for procurement and engagement with software delivery suppliers to augment the internal capability. The Information Centre uses this framework to score potential suppliers on agility to help selection. The Information Centre has also developed an 'Agile Outsourcing Contract' to help both parties work in a more collaborative way and maximise the work flow. It pays its suppliers based on earning points, and each deliverable has an allocation of points. An engagement team is responsible for agreeing and evolving the point scoring mechanism and resolving issues through the project. Members of this team are drawn from both the Information Centre and the supplier.

Lessons learned

With hindsight the IT Development function thinks it would have been useful to develop an organisational change management plan. It could have made a strategic assessment of where the Information Centre wanted to be in terms of Agile delivery, and what needed to change to get there. The IT Development function then could have produced a map to direct and pace the activity to transform the Information Centre. The IT Development function has to do more to help operational teams be comfortable with the idea that agile developments provide them with multiple releases of their product or service.

Challenges

The IT Development function believes that product owners need to be working for between 25 and 50 per cent of their time with the delivery teams. The business stakeholders are not used to being involved in delivery in such a comprehensive way, so persuading the business to commit this amount of time to projects has been difficult.

Enablers

The Information Centre told us that perceptions of poor delivery in the past provided a stimulus for change and successful Agile projects have sustained it.

The programme manager was given freedom to make decisions and act.

Examples of Agile practices

The Information Centre uses the product backlog to hold the scope of the project and the list of fine-grained requirements (user stories). It is prioritised by the product owner, based on the value of the user stories to the business. The requirements are elaborated on a just-in-time basis, through face-to-face dialogue between the development teams and business users. They are delivered rapidly via a series of short iterations which result in working functionality. Progress against the plan is recorded on visible task boards and assessed objectively, based on the completed working functionality in the daily stand-up meeting.

Intellectual Property Office

Agile projects

- Electronic records management system
- Intellectual Property Office intranet
- Upgrade to Windows 7
- Business case management application
- Change management including, portfolio, configuration, release, problem and incident management, prioritisation and planning

Rationale for Agile approach

The Intellectual Property Office decided to cut costs by bringing an outsourced publishing process in-house in 2011. Initial progress was slow and because the contract expiry date was approaching, a senior developer suggested that agile development might help deliver a solution before the deadline. The ICT Department talked to Companies House and the Department for Work and Pensions and found the evidence from them for Agile methods quite compelling.

Measures of success

The Intellectual Property Office is using Agile methods to assist with business change so, if it delivers against its business plan, to time and cost, the organisation considers that it will have been successful with Agile delivery. The ICT Department is developing metrics to measure their Agile capability and improve their performance.

Persuasion process

Based on the successful delivery of the publication facility in December 2011, the ICT Department re-examined its electronic records management project. Original estimates using a traditional approach were £993,000, with 21 months of development and a four-month roll out. The Intellectual Property Office considers that experiences in other departments indicated these estimates were very optimistic. The cost and timescale were not acceptable.

The Intellectual Property Office approved a new proposal that used Agile methods and built on existing SharePoint facilities. The Development team delivered a finished working solution, complete with training material, to the first business area in six months at a cost of £107,000. This solution is now being introduced into the rest of the organisation in a 12-month programme. The Intellectual Property Office estimates it will achieve 80 per cent savings on cost and 28 per cent on timescale.

Although seniors in the ICT Department championed the introduction of Agile delivery, the Intellectual Property Office reported it has been popular with all involved. A further four Agile projects are underway.

Staff skills and expertise

Around 40 people in the Intellectual Property Office have had specific training on Agile methods and around half of them have been heavily involved in agile development projects. The Agile training consultant also ran sessions for the Board to help them understand Agile delivery and its benefits.

Agile tools and methods being used

The Intellectual Property Office has chosen the Scrum framework.

Lessons learned

The Intellectual Property Office experimented with different Agile methods before finding one that suited its staff and culture.

It invested in training and support for staff to take on the developer and business owner roles. With hindsight the Intellectual Property Office considers that it should have invested more, early on, in raising awareness within the user and management communities.

Challenges

The Intellectual Property Office has dedicated Agile teams that work together, but it believes that this has created logistical challenges with the accommodation and organisation of the teams that are not currently involved in Agile projects. The other challenge is for the user community. It has to get used to the new ways of working, instead of the detailed requirement specifications, project plans, meetings and reports associated with traditional development methods.

Enablers

ICT staff report they like Agile delivery. They faced many blockers and legacy issues which were proving difficult to manage. With agile development, these big issues are broken down into manageable tasks and the team organises this work into short phases with a clearly defined outcome.

The Intellectual Property Office reported that processes across the organisation have to be modernised, in line with government strategy for services that suit citizens' and businesses' needs, at a time of reduced funding. The resulting business change programme means there are plenty of projects in which Agile methods can be of use.

Examples of Agile practices

The Operating Committee approves and prioritises a large Agile project from a description of the business change and an assessment of benefits, risks, strategic fit, resources needed and the capability to deliver. The team will go back to the Operating Committee following a deeper analysis, before beginning sprint planning and collecting user stories.

In every team the business owner, the Scrum master and the developers prioritise the product backlog to ensure that the team concentrates on the most valuable tasks to the business as a whole and prevent minor issues combining to become a major problem.

Ministry of Defence

Agile projects

- Imagery Exploitation Programme

Rationale for Agile approach

Staff in the Intelligence Surveillance Target Acquisition and Reconnaissance Team wanted to deliver better outcomes on a project for the development and procurement of equipment for imagery exploitation (tools for identifying, interpreting, measuring and extracting information; preparing reports and disseminating intelligence). As there is uncertainty about what the full range of future imagery exploitation equipment might be and because the speed at which technology develops is rapid, the team felt it was better to deliver some military capability into service part the way through the project and then add to or improve on it. To achieve this aim the team decided to adopt a more flexible and common sense approach to developing a set of requirements. It was after the concept phase had begun that the term Agile was given to this already agreed approach.

Measures of success

The Department considers that the Agile approach will have been a success if the project team delivers affordable equipment in a timely manner that achieves the desired outcomes, as defined by intelligence specialists and the expeditionary forces. The project team will not rely on the traditional measure of counting the number of outputs delivered against the detailed requirements specification. The project team wants the analysts to be satisfied with the equipment, rather than using it despite its limitations.

Persuasion process

The project team gained the agreement of the sponsor and the programme manager in the delivery team for the flexible approach. At a similar time, the Chief Information Officer's directorate was looking for a pilot project for the Department to comply with the actions for Agile delivery in the Government ICT Strategy. The Chief Information Officer's staff considered a variety of ICT projects across the Department and decided to focus on the military part of the business because lessons learned from an equipment project using Agile methods could be applied more widely and frequently. The Imagery Exploitation Programme was the most suitable equipment project and the use of an Agile approach was endorsed on 15 June 2011.

Staff skills and expertise

The project team is made up of ten members of staff from across the Department. A further 29 people are involved in consultations as the stakeholders, representing the sponsor; the equipment users (analysts); the policy, procurement and scrutiny communities and senior management. Neither the project team nor the stakeholders have any experience of Agile delivery and no training has been provided.

Challenges

The project team told us that the approach requires a collaborative way of working and it has found that at times the stakeholders have reverted to their conventional silo behaviours on equipment projects. The project team also feels that the way in which central government typically applies European Union procurement presents a challenge.

Enablers

The Department considers that support from all 29 stakeholders for the project team's new approach has been important. They have continued to be actively involved, attending meetings as and when necessary and contributing fully to the iterative definition of the requirements.

Examples of Agile practices

The project team has drawn up a short 'mandate' which defines the boundary and the benefits of the equipment capability to defence. This initiation document describes the non-functional requirement of the technology – what it must achieve, rather than how it does it. The project team has profiled the funding in phases that match the release of equipment into service.

A wide range of representatives from across the Department have been involved to identify and develop solutions. These staff cannot send deputies and they are authorised to give their units' view.

Office for National Statistics

Agile projects

- Consumer Price Index/Retail Price Index re-engineering

Rationale for Agile approach

The Department has been using Agile methods since 2005. At the time the Government ICT Strategy was published the Department was seeking to introduce further Agile techniques. The team changed its Agile approach halfway through this project. It had experienced difficulties in defining the complex requirements and the suppliers were unable to provide a product that met the needs of the business after four iterations of the development cycle.

Measures of success

The Department reported that it used an Agile method, to varying degrees, in approximately ten per cent of its ICT projects in 2011. It considers that the price indexing project will be successful if the team delivers the high-level requirements within the budget and meets the quality criteria.

Persuasion process

The project board was aware that the team was not making progress on the existing price indexing project and an alternative plan was required. The team decided on a pilot using a different Agile approach and delivered a working product to the board during a two week development cycle. The Statistical Systems Development and Support directorate considers that the team demonstrated how an Agile approach could speed up projects and deliver a working system that was more attuned to the needs of the business. This demonstration, together with plans for Agile delivery by the team and suppliers, persuaded the board to proceed with the project using the revised approach.

Staff skills and expertise

Staff involved in the project received an introductory session on the project and the Agile approach. However, the Statistical Systems Development and Support directorate believes that most skills are acquired 'on the job', with staff working alongside more experienced colleagues in the organisation and its suppliers.

Agile tools and methods being used

The Department used the framework provided by the Dynamic Systems Development Method to implement Agile. Recently, it has adopted Scrum and Feature Driven Development methodologies. The Department uses a project tracking tool to manage its backlogs and application development tools.

Supplier partners

For the price indexing project the Department used an existing framework to select a supplier to develop software and provide experienced Agile practitioners. The Department's staff are responsible for programme management, testing and integration. The supplier has a fixed price contract for at least a year, with deliverables based on high-level business requirements.

The supplier has subcontractors based in India, which the Department believes has helped keep the project to time. The code can be written overnight when required because of the time difference.

Lessons learned

The Statistical Systems Development and Support directorate has recognised that the Department needs to use Agile methods throughout its business change projects, rather than only on the software development part of a project.

Challenges

The Statistical Systems Development and Support directorate told us that in some instances the project team has found it is unable to make decisions quickly enough to deliver the requirements because of the tensions between the Department applying strong control over projects from the centre and Agile principles.

Enablers

The Statistical Systems Development and Support directorate believes that the board and programme team have a strong desire to apply Agile methods. The product owner has the necessary knowledge of and expertise in statistical analysis and is willing to commit significant time and effort to the project on a day-to-day basis. Four statisticians from the business have also helped with the specification and user acceptance tests. The Department has built multidisciplinary teams and co-located them, which it considers helpful in effectively representing stakeholders' needs and improving communication.

Examples of Agile practices

The Department uses workshops to plan out the theme for each iteration, the output of which is a dialogue diagram (a visual map of the steps in the user stories).

The product owner observes progress throughout sprints using frequent informal desk-based demonstrations and regular formal demonstrations of the product. Through these the product owner can redirect development where required.

Office of the Public Guardian

Agile projects

- Digital Transformation Programme

Rationale for Agile approach

The Office considers its existing ICT systems are not fit for purpose because they are inflexible and can be unreliable. Using an Agile approach to develop a new ICT system gives the organisation the opportunity to quickly deliver new services, including digital access for citizens and businesses, and regularly improve them based on user feedback on the live operational service. The Office felt that Agile methods also offers it a more cost-effective way to make changes to the system than using existing contractual change control processes with its ICT supplier. The Chief Executive supported a new approach.

Measures of success

The Office considers that the agile development will be a success if it can help to deliver the benefits in the Digital Transformation Programme business case.[15] Principally these are: fewer errors in the registration for powers of attorney and a reduction in the cost per transaction.

Staff skills and expertise

The programme manager and delivery manager have some experience of Agile methods. The Office is recruiting additional skilled staff to develop the software and lead some of the work streams. Staff from a small- and medium-sized enterprise were a supplement to the internal team of developers.

Supplier partners

The Office aims to use a supplier to provide open source code for the digital service. The contract the Office will be using is based on high-level outcomes: a pilot system delivered in six weeks and the first release of the live system in three months. The Office pays on a fixed time and materials basis and the supplier can be changed if it does not perform.

Lessons learned

With hindsight the Office thinks it would have been useful for the programme team to have more experience in Agile delivery before embarking on a significant business change programme. This would have enabled them to draw on good practice and reduce miscommunication, improving the effectiveness of the programme team.

The Office also considers it important to make sure that the programme team has sufficient resources available to reduce the risk of poor delivery in the later stages of the programme.

Staff from other parts of the Office have been encouraged to volunteer to join the programme to complete short pieces of work (from as little as two hours, to as much as a two week sprint). The Office believes this practice is giving more staff exposure to the Agile approach and helping persuade them of the benefits.

15 Traditional governance arrangements wrap around the agile ICT elements of the programme. The Office is following, with a degree of flexibility, the standard Gateway process to govern progress.

Challenges

The Office has found that the length of time it takes to gain spending approval is a barrier to progress. It has been difficult to persuade some staff that Agile delivery works, particularly those who are very familiar with more traditional project management approaches.

Enablers

Staff from the Government Digital Service worked with the senior members of the transformation programme team to develop an Agile approach to deliver the ICT elements of the Programme. The Government Digital Service team also invested time in describing the benefits of Agile delivery to project managers, work stream leads and business stakeholders. The Office considers that the Government Digital Service team has been a vital part of the Programme, in particular in working with the supplier to deliver the required products.

Promotion of the Government's digital agenda by the Cabinet Office has kept the Digital Transformation Programme in the spotlight within the wider organisation.

The Office expects the Government Cloudstore will provide it with access to suppliers that can provide agile development and hosting and support services if required in the future.

Examples of Agile practices

The programme team holds regular show and tell sessions for stakeholders, which included a demonstration of the prototype to a Justice Minister. Administration staff tested the first release of the new business processes and supporting ICT system in a 'model' office in August 2012. They provided feedback so that improvements could be included in the next iterations of the development.

The programme team comprises people working on many different work streams. Staff hold regular meetings to ensure that they are all working cohesively to deliver the one programme of work.

Technology Strategy Board

Agile projects

- Development of _connect (social networking system for collaboration and innovation)

Rationale for Agile approach

The Technology Strategy Board became independent from the Department of Trade and Industry in 2007 and it has few legacy systems. It has been using Agile methods for about three years for some of its ICT development. In particular, those projects where the requirements are not fully defined at the outset and there is no fixed deadline.

The Technology Strategy Board finds Agile delivery offers a way to customise its applications by using prototypes, which can be scaled up if successful, and continuously develop its emerging systems architecture.

The business defined 1,200 requirements in the project to create a social networking system for knowledge transfer. The IT Department knew it would not be able to fulfil all these requirements, so proposed an iterative development. The staff's reasoning was that if they delivered in phases then the users' satisfaction would define the family of applications which would deliver an acceptable final solution. They also considered that this Agile approach would help them improve the integration of the code into the existing architecture, a process that in the past had been problematical when the volume of code was large.

Measures of success

The IT Department measures user acceptance, issue resolution and user satisfaction. It considers Agile delivery is successful if complaints from users and customers are fewer.

Persuasion process

The IT Department perceives that the Technology Strategy Board needs to be seen as up to date. Senior management also viewed the organic growth of in-house systems as a positive for an organisation that invests in research and development to advance technology.

For the social networking system project the IT Department produced a business case based on the benefits and reduced costs of bringing the capability in-house. The board approved a set of high-level deliverables and an initial plan of activity for six months. At the end of the first phase in October 2009, the IT Department and its supplier delivered two new websites for the knowledge transfer networks in the energy and financial services sectors.

The IT department found the period up until the service was released to the market somewhat difficult as the wider business could not see that the project team was making progress. Senior executives now have a good level of understanding of agile development and recognise when the IT Department has control of projects, even when it is not following traditional project management processes. Being able to demonstrate savings has also helped persuade the business that it is worth investing in agile methods when there are suitable projects.

Staff skills and expertise

The Technology Strategy Board has not provided any specific training for its staff on Agile working. It has recruited developers with experience of Agile methods. People gain and improve their skills while working on Agile projects. Agile delivery is not the only method the Technology Strategy Board uses for its ICT projects.

The Technology Strategy Board ran a full day conference on the Agile approach for around 70 of its staff. For the first six months, until the staff could see some deliverables, the IT Department sent out a newsletter to them with information in non-technical language on the key features of the system, when to expect its release, what staff should expect in the migration process and how to report faults.

Supplier partners

A medium-sized enterprise won the initial contract to support the Technology Strategy Board with its web application developments for the social networking system project.

Agile tools and methods being used

The Technology Strategy Board uses an Agile project tracking tool to manage issues.

Lessons learned

The Technology Strategy Board considers that a pragmatic approach to prioritising features for release is important. The IT Department makes sure that each area of the business has at least one feature included in a release, so that the users' interest is maintained. The Head of IT prioritises minor issues that need fixing, which otherwise might never be tackled, in each iteration. This helps staff maximise the work completed in each iteration, because teams will have the choice of some short tasks as well, and keep technical debt to a manageable level.

With hindsight the IT Department feels it could have put more effort into the change management side of introducing Agile. That way staff would have been better educated about Agile methods, their expectations would have been more realistic and they would have understood more about the tester review cycles.

Challenges

The IT Department reported that managing the input from the wide range of internal and external stakeholders has been the most challenging aspect of using an Agile approach. It has to constantly balance their needs while maintaining existing systems.

Finding staff that are suitable for the role of business owner has been difficult. They should not have a pre-conceived idea for the technology solution and need to have clear opinions as to what the customer will prefer. In the past it has been necessary to produce a requirements document listing all user stories to demonstrate to the business owner that the project team has delivered as agreed. The IT Department considers that it is improving its screening process to identify employees who can provide 'quick and dirty' validation of requirements or a design, from the perspective of the customer.

Enablers

Staff felt that, because the Technology Strategy Board is small (150 employees) and relatively new, it was fairly easy to get the business to accept Agile. Also the Technology Strategy Board was not tied to a systems integrator for its ICT. Senior managers strongly support the use of Agile methods, having challenged staff to think innovatively about ICT, including using open source software.

Examples of Agile practices

The Technology Strategy Board has adopted cross-functional teams, consisting of staff with different skills from across the organisation, such as business analysis or communications. A project team is not just composed of staff with different roles in the IT Department. The Technology Strategy Board has inserted some of its business owners and project managers in teams run by its suppliers.

The team shares a simplified version of their burndown chart to give senior management a probable average for the completion of the work for the release. As the project progresses the IT Department makes a release every six weeks.

Figure 4
Key facts about projects classed by central government organisations as Agile

Organisation	Project name	Purpose	Cost (£)
Cabinet Office	Electoral Registration Transformation Programme	Introduce a digital solution for electoral registration, with service enhancements	1.6 million (for the Agile ICT components of the change programme)
	Government Procurement Service website	The rapid development of an information web portal for all users of the Government Procurement Service, both buyers and suppliers	150,000
Companies House	Case management	Develop and improve upon a case and contact management system	155,000 (phases 1 and 2, currently estimating phase 3)
	Joint registration system	Extending Web incorporation services to allow sign up for corporation tax	60,000
	Dormant subsidiary exemptions system	To reduce regulatory burden with respect to accounting requirements	50,000
	E90	To improve customer journey and experience of our web filing services	160,000 (phase two currently being estimated)
	Charges reform update	To implement legislative changes to simplify and e-enable the filing of charges against a company	520,000
	Customer improvement phase 1	Further improvements to customer journey and experience of our web filing services	170,000 (forecast)
	Abbreviated accounts template	Web services for filing dormant company and abbreviated accounts	460,000 (forecast)
Department for Transport – Maritime and Coastguard Agency	Modernising HM Coastguard	To provide a new nationally networked coastguard function and a better supported volunteer Coastguard Rescue Service	14,700
Department for Transport – Driving Standards Agency	Modernising the Internet Booking System	Redevelopment of a transactional website that allows citizens and instructors to book and manage practical driving test appointments (approximately 2.2 million transactions per year) using various devices including mobile phones	740,000

Start date and duration	Time to deliver first product/live service	Team size	Performance metrics
February 2012 3–4 years duration	6 months	12	Accomplished, backlog, planned user stories, velocity and cost
January 2012, 12 months	12 weeks	2	Time, cost, unique visits to website, time on page, bounce rate, user satisfaction
October 2011, 18 months	6 months	10	
October 2011, 7 months	7 months	6	
April 2012, 2.5 months	2.5 months	8	
September 2011, 20 months	8 months	10	Defect rates, story point velocity, burnup and burn down charts and costs
November 2011, 17 months	17 months	11	
May 2012, 8 months	8 months	5	
May 2012, 11 months	2 months	8	
November 2012 to March 2015	November 2012, website delivered in 2 weeks	11 full-time equivalents and internal volunteers drawn from all specialisms for delivery of discrete work packages	Quality metrics, including number of first release faults for new software, level of staff engagement with an Agile project and proxy measures for satisfaction – increased number of users, reductions in negative feedback
April 2012, 7 months	7 months	Internal – 3 full-time equivalents External – 6 full-time equivalents	

Figure 4 *continued*
Key facts about projects classed by central government organisations as Agile

Organisation	Project name	Purpose	Cost (£)
Department for Transport – Vehicle and Operator Services Agency	Deliver improved entity search capabilities, use of application programming interfaces and shopping basket concepts	As part of modernising the ICT landscape a number of pilot projects have been identified to test concepts to inform the enterprise architecture and programme delivery approaches	<100,000 (internal resource only, using open source products and existing hosting services)
Department for Work and Pensions	Personal Independence Payment	To introduce a new benefit system to help disabled people live full, active and independent lives	646 million
	Universal Credit	To deliver an online system to provide support to people when they need it most and encouraging them to work, while simplifying a complex array of benefits	2.2 billion
Department of Energy and Climate Change	Quarterly Fuel Index	Database to track fuel prices	60,000
	Domestic Fuel Index	Database to track domestic fuel prices	60,000
Department of Health	Spine 2	To deliver a replacement to Spine 1 (the core of the NHS Care Record Service)	[1]
Health and Social Care Information Centre	Healthchecks	A system used to collate GP health check dataset	[1]
	Patient Reported Outcomes Measures	Receives data from providers, links to Hospital Episodes Statistics, provides metrics to providers and publishes results	[1]
	Clinical Audit Transition	A technical refresh of a large set of clinical audit systems from Lotus notes to .Net	[1]
	Diagnostic Imaging Dataset	Provides a system to receive radiology data, aggregate and publish on an interactive cube viewer	[1]
	Calculating Quality Reporting Service	To provide indicators for Outcome Framework payments	[1]

Start date and duration	Time to deliver first product/live service	Team size	Performance metrics
April 2012 to present	Urgent business requirements, for example 'find your nearest?', prototyped using this approach, platform within 1 week and deployed in less than 4 weeks 7 months Remaining activities will be beta test and deployment	3 (mainly part time)	High business interest for products to be widely deployed in the organisation
June 2011 – October 2013 (committed, further releases beyond this including e-services being planned)	April 2013 (New Claims)	Circa 150 on IT (excludes suppliers)	Tracking performance against delivery of milestones at present
October 2010 7 years	April 2013 (Pathfinder Pilot)	1,532 on IT including supplier resources	Earned Value Analysis across all IT and business products workstreams mapped to each business episode or live release
June 2011, 94 days	25 days	3	[1]
June 2011, 100 days	30 days	3	
Proof of concept June 2011 Project approved April 2012 18 months	Autumn 2012	4, expecting to rise to around 15	Monitoring of user stories, burndown in the short term Burndown at an epic/theme level over the long term
September 2011 to February 2012	3 months	5	
July 2011, 12 months (releases 1–4)	3 months	6	Metrics on stories not completed and not started, sprint velocity, defect and code quality, scope – must have/ should have/ could have requirements RAG rating on status of release, stability of technical architecture, business collaboration Issues and actions, risks
Summer 2011, 12 months	3 months	6	
December 2011, 10 months	5 months	5	
February 2012, 14 months (phase 1)	6 months	2 teams of 5/6	

Figure 4 *continued*
Key facts about projects classed by central government organisations as Agile

Organisation	Project name	Purpose	Cost (£)
HM Revenue & Customs	Aspire Collaboration and Cloud Services (ACCS)	Over 40 small, non-complex projects have been delivered. The ACCS solution uses Agile as its default methodology	[1]
	12AU	To improve Debt Management Telephony Centre efficiency	estimated 1.4 million
HM Treasury	Staff Change Requests – process efficiency	To implement a single unified approach to Staff Change Requests that is simple for all users and meets the needs of IT, facilities, human resources and finance	355,000 (forecast)
Intellectual Property Office	Develop an electronic records management system	To introduce a National Archives compliant electronic records management system	207,000
	Replace case management application	Replacing a business critical system before the existing solution supplier withdraws support	2 million
	Change management	Process improvement introducing portfolio management and improving change, problem, incident, resource and configuration management	265,000
	Cross-office introduction of Windows 7 and virtual desktops	Part of a major infrastructure modernisation programme	200,000
	Re-design the Intellectual Property Office intranet	To introduce a more user-friendly intranet design	14,000
Ministry of Defence	Imagery Exploitation Programme	To develop the requirements for a capability that will allow UK and coalition forces to use images, which keeps up-to-date with technological advances	[2]

Start date and duration [1]	Time to deliver first product/live service [1]	Team size [1]	Performance metrics [1]
July 2012, 9 months	5 months	10 (supplier and department staff)	Reducing the burden on debt collectors while handling calls, reducing call handling times, improving the customer experience
February 2012 24 weeks	16 weeks	6	Budgets, resources, milestones, backlog progress, velocity of sprints, quality assurance
June 2011, 18 months	6 months	6	
November 2011, 18 months	16 months	22	
January 2012, 12 months	7 months	5	Achievement of the 'definition of done' for each sprint
March 2012, 9 months	6 months	7	
April 2012, 2 months	2 months	6 (part time)	
November 2011, funded for 6 years	Not known – in concept phase	10 plus a larger group of stakeholders	Not defined as yet

Figure 4 *continued*
Key facts about projects classed by central government organisations as Agile

Organisation	Project name	Purpose	Cost (£)
Office for National Statistics	Consumer Price Index/Retail Price Index re-engineering	Provide a system to calculate pricing indexes to replace existing spreadsheets	4.9 million (2.1 million software development)
Office of the Public Guardian	Digital Transformation Programme	To change from a paper-based to a digital organisation, providing access to services digitally	8 million–10 million
Technology Strategy Board	_connect Development Programme	To create a central social networking system by streamlining the existing 22 systems	2.1 million

NOTES
1 Information was not available.
2 Information is commercially sensitive.

Source: National Audit Office survey of 26 central government organisations

Start date and duration	Time to deliver first product/live service	Team size	Performance metrics
January 2009 – feasibility study June 2009 – design stage January 2010 – proof of concept	May 2012 – full service launch (phase 1)	10 internal 40 from supplier	[1]
October 2011 18 to 24 months (2 to 3 years for benefits)	6 months to pilot digital service (alpha) 12 months to a live digital service (beta) 18 months to full operational service	[1]	Not defined as yet
2009, 2 years	6 months	Average of 20 (internal and suppliers)	Burndown charts, product backlogs, budgets

Appendix One

Methods

Literature review

1 In January 2012 we conducted Internet-based research to define Agile delivery. The descriptions of Agile practices and characteristics enabled us to understand what Agile methods offer teams undertaking business change projects and programmes. Our sources included:

- Cabinet Office and HM Government publications;
- Institute for Government;
- the Agile Manifesto;
- Gartner, Inc;
- Socitm (Society of Information Technology Management);
- Ovum;
- IPL (Information Processing Ltd); and
- analyst blogs.

Agile characteristics for central government

2 From our literature research and discussions with subject matter experts from professional service companies, we developed five characteristics for Agile delivery in central government, which the cross-government Virtual Agile User Group agrees should be typical of Agile delivery. The characteristics, with some actions and behaviours that demonstrate agility, are listed in **Figure 5**. They are not a set of criteria that all Agile projects must display from the outset, nor do we use these to measure government organisations' performance; rather they help build a picture of Agile practices for government.

Catalogue of projects using Agile methods

3 To compile a list of central government projects which organisations describe as Agile, we used information that organisations had posted on the Internet and spoke to subject matter experts from Emergn, Foden Grealy and the Agile Delivery Network. We also attended the Government Digital Service's 'Agile Tea Camp'.

Figure 5
Agile behaviours and actions

Citizens and business are at the heart of delivery

A clearly articulated purpose is tied to the main beneficiaries' (citizens and business) needs

A representative, known as the business owner, takes a role to champion beneficiaries' needs among all internal stakeholders

Main beneficiaries' views of the value of the service continuously drive the definition of the final solution

Effort is focused on defining and testing the value to citizens and business to deliver the outputs of greatest significance as early as possible

The solution is changed over time to adapt to uncertainties and the evolving understanding of business needs

Beneficiaries test the working service regularly and give feedback. A team responds to new evidence about delivered outputs as it emerges throughout the delivery

Deliver a service or business change quickly and continuously to improve on it

The project is initiated quickly and investment is in project outcomes

An available-to-use service is delivered very early in the project – with regular improvements made to it

A small number of business needs are being worked on at one time

Development cycle times are measured in days or weeks. The team estimates the requirements that it can deliver within this set period of time

Uncertainties, assumptions and risk are validated as soon as possible

Deliverables that require rework (technical debt) are recorded and managed

Problems with the outputs are discovered early to allow a quick recovery

A team has an understanding of flow and continuously works to overcome barriers and improve it

Delivery is measured regularly in terms of velocity (speed and value to customer), and necessary changes are made to maintain the pace

Progress is measured against tested outcomes that the business owner has signed off as 'done'

The funding profile is synchronised with the releases and is allocated as the releases are signed off as done

Full service is built from small independently usable releases

Complex business needs are broken down into deliverables which each provide value

The live operational service is delivered in several releases

Deliverables are continuously integrated with the live service

The project can be stopped at any time and still have delivered value

Quality measures are designed and set-up at the outset and used throughout the delivery

Figure 5 *continued*
Agile behaviours and actions

A team is responsible for making decisions rapidly

A team makes the decisions collectively; managers remove obstacles and facilitate the delivery of the project

The allocation of tasks is visible to the whole team, and individuals self-select the tasks that they do

An environment which promotes collaborative working is in place

Progress, in terms of achieving business outcomes, is shown in a visible way to the team, rather than that processes have been followed

A team defines the norms of how it works together

A team makes decisions on competing business needs based on their value to citizens and business

A team demonstrates each deliverable to senior stakeholders and receives feedback before proceeding

A team can raise issues and get them resolved, because senior executives respond quickly when requests are escalated

A team continually redirects resources to maximise the value it delivers

A team aims for economy of labour and understanding – what is the absolute minimum of effort that is required for each output. There is no 'gold-plating'

A team uses conversations in preference to documents. They only create documents where these add value

A team learns and develops its skills continuously. Improvements are made throughout the project to increase the team's capability to deliver value

Through experimentation a team reviews how it can improve, so it can introduce new ways of working throughout the project

A team consists of a range of people (including technical experts, users, quality assurance and a business champion) that focus on the whole service. The team are not a group of specialists, in one discipline, that work with other teams of individual disciplines on separate deliverables

The business owner is embedded within the project team

A team is responsible for embedding quality throughout the project, delivering a 'fit for purpose' service

Source: National Audit Office literature review and interviews

4 We identified 26 organisations that could be using Agile methods:

- Cabinet Office
- Companies House
- Department for Business, Innovation and Skills
- Department for Communities and Local Government
- Department for Environment, Food and Rural Affairs
- Department for Transport
- Department for Work and Pensions
- Department of Energy and Climate Change
- Department of Health
- Driver and Vehicle Licensing Agency
- Driving Standards Agency
- Government Communications Headquarters
- Health and Social Care Information Centre
- HM Revenue & Customs
- HM Treasury
- Highways Agency
- Home Office
- Intellectual Property Office
- Maritime and Coastguard Agency
- Ministry of Defence
- The National Archives
- Office for National Statistics
- Office of the Public Guardian
- Ordnance Survey
- Technology Strategy Board
- Vehicle and Operator Services Agency.

During our fieldwork we found that some of these organisations were only considering how to use Agile methods and there are other departments, including the Department for Education, which have pilot projects underway.

Semi-structured interviews

5 In April and May 2012 we held face-to-face or telephone interviews with representatives of 17 central government organisations. We interviewed senior technologists and project managers about:

- their experience of implementing Agile delivery in their organisation, including the rationale for using an Agile approach, how they measured success, staff skills and expertise and which Agile tools and methods they were using; and
- the actions and behaviours that demonstrate delivery teams are using Agile methods.

6 We have not used the information we collected to conclude on which Agile practices government organisations should be using. We present this information in a series of case examples, which may help government organisations when setting up their own projects.

Appendix Two

Key Agile terms and concepts

Agile coach

A person responsible for supporting and improving the capability of an organisation to deliver in an Agile way.

alpha and beta versions

Software that is made available publicly for testing. After the alpha phase the software will be feature complete. The beta phase is usually when the software is available outside the organisation. The users test it to identify bugs in the software.

avatar

A graphical representation of a user.

backlog

A prioritised list of requirements that are waiting to be worked on.

bug

An error, flaw, mistake, failure, or fault in a computer program or system that produces an incorrect or unexpected result, or causes it to behave in unintended ways.

burndown chart

A visual representation that shows work remaining over time.

burnup chart

A visual representation that shows work completed over time.

business change

Changes in the way an organisation functions brought about through a project or other initiative.

business owner/product owner

The person who is accountable for what is being built on behalf of the organisation and usually has the final say on the detailed decisions.

code/source code

The instructions written by computer programmers, which are automatically translated into computer programs.

code base

The whole collection of source code used to build a particular application.

continuous integration

Where individual software modules are combined and tested with existing software as soon as they are produced.

defect

a measurable effect caused by a broken piece of code.

definition of 'done'

An increment of a product that is ready for continual use by the end user. Can also be referred to as 'done, done'.

deployment

All of the activities that make a software system ready for use.

enterprise architect

A person responsible for translating the organisation strategy into business change by translating the key requirements for the organisation's future state.

epic story

A large requirement which is broken down into more manageable user stories.

functional specifications

The document which describes the behaviour of a system, including what is needed by the user.

functionality

The behaviours that a computer system is designed to achieve.

integration

Where individual software modules are combined with existing software.

iteration

A short time period in which a team is focused on delivering an increment of a product that is useable.

Lean

Techniques to streamline processes and eliminate any activities that do not add value to the user.

non-functional requirements

Describe how the system should operate as opposed to functional requirements which describe how it should behave. Typical examples would be: security, accessibility, usability, availability, response times, etc.

pair programming

A software development technique where two programmers work together at one workstation. One writes the code, while the other reviews it as it is typed in.

release

The transition of the final product from the development team into routine use by the end user.

release plans

A plan that sets out the order in which user requirements will be released into live service.

retrospective

A reflective meeting to discuss how a team has worked together and identify ways in which they can improve how they work.

rework

Components of a project that will need to be revisited to correct bugs or altered to meet new requirements.

Scrum master

A servant leader to the team, responsible for facilitating, supporting and removing impediments.

show and tell

Where the delivery team demonstrates how the product or service works at the end of each iteration to illicit feedback.

sprint

An intense increment of work within a fixed time frame.

stand-up

A short meeting conducted standing up to report progress, share impediments and make commitments.

technical debt

Poor programming and architecture within a code base. The consequence of technical debt is that more time is needed later on in the project to resolve coding issues.

test-driven development

A developer creates automated unit tests that define code requirements then immediately writes the code itself. Passing the tests confirms correct behaviour as developers evolve the code.

testing

A set of actions undertaken to assess whether a system behaves as expected.

user story

A high-level business requirement that is focused on an outcome. It captures the 'who', 'what' and 'why' of a requirement in a simple, concise way.

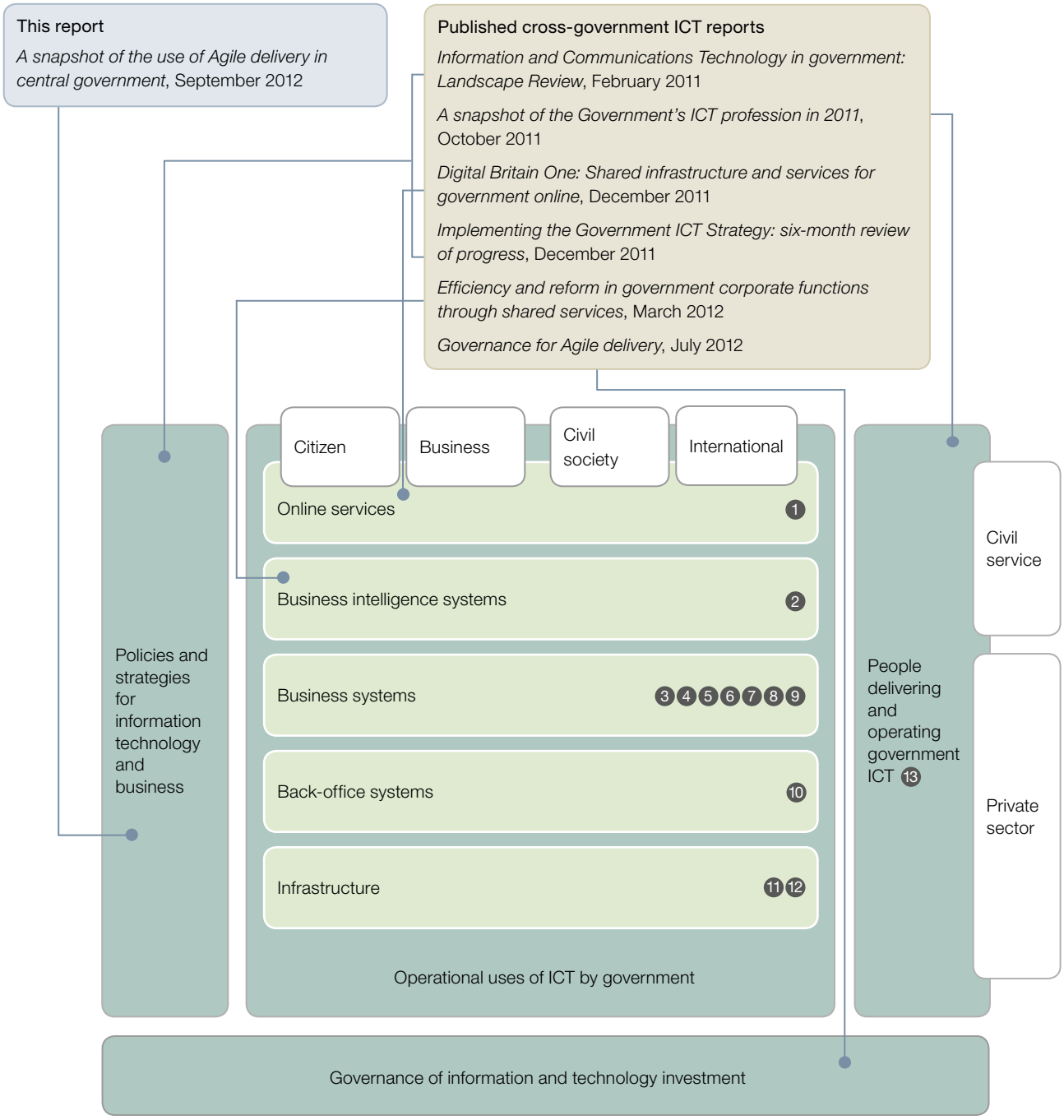
velocity

The rate at which a team completes work.

Appendix Three

National Audit Office publications focusing on the key components of government ICT

The diagram overleaf shows how this report fits with relevant publications that explore performance across government, as well as those which tackle effectiveness of ICT within specific departments.



NOTE

1 For published client reports focused on ICT see next page for a full list

Published client reports, focused on ICT

Online services

1 *HM Revenue & Customs: The expansion of online filing of tax returns*, November 2011.

Business intelligence systems

2 *Ministry of Defence: The use of information to manage the logistics supply chain*, March 2011.

Business systems

3 *Department of Health: The National programme for IT in the NHS: an update on the delivery of detailed care records systems*, May 2011.

4 *Department for Communities and Local Government: The failure of the FiReControl project*, July 2011.

5 *The Crown Prosecution Service: The introduction of the streamlined process*, November 2011.

6 *Department for Work and Pensions: The introduction of the Work Programme*, January 2012.

7 *Department for Work and Pensions: Child Maintenance and Enforcement Commission: cost reduction*, February 2012.

8 *HM Revenue & Customs: The compliance and enforcement programme*, March 2012.

9 *Department for Environment, Food and Rural Affairs and the Animal Health and Veterinary Laboratories Agency: Improving the delivery of animal health and welfare services through the Business Reform Programme*, July 2012.

Back-office systems

10 *Department for Business, Innovation and Skills: Shared services in the Research Councils*, October 2011.

Infrastructure

11 *Department for Environment, Food and Rural Affairs: Geographic information strategy*, July 2011.

12 *Home Office and National Policing Improvement Agency: Mobile technology in policing*, January 2012.

People delivering and operating government ICT

13 *Department for Business, Innovation and Skills and Skills Funding Agency: Adult apprenticeships,* February 2012.

Where to find out more

The National Audit Office website is
www.nao.org.uk

If you would like to know more
about Agile delivery, please email:
ictauditcontactpoint@nao.gsi.gov.uk

Twitter: @NAOorguk

For more information on government's
use of Agile methods:
http://agile.civilservice.gov.uk

www.nao.org.uk

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