



National Audit Office

**REVIEW**

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# Governance for Agile delivery

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**Examples from the private sector July 2012**

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National Audit Office

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# Part One

## Introduction

**1.1** The term agile is commonly associated with software development.<sup>1</sup> 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*<sup>2</sup> 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.

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### 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](http://www.agilemanifesto.org/principles.html)

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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](http://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.<sup>3</sup> 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.”<sup>4</sup>

**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<sup>5</sup> 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<sup>6</sup> 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.”<sup>4</sup> 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 is the first in a series of reports on Agile. Our findings will be of interest to those in publicly funded bodies who are using or considering Agile delivery. The Institute for Government has stated that effective governance and accountability structures are vital for an Agile approach to work.<sup>7</sup> We aim to provide practical support to organisations to meet government policy objectives to use Agile delivery to improve public services, including making more of them digital.

3 Cabinet Office, *Government ICT Strategy*, March 2011, available at [www.cabinetoffice.gov.uk/content/government-ict-strategy/](http://www.cabinetoffice.gov.uk/content/government-ict-strategy/)

4 Available at: [www.publications.parliament.uk/pa/cm201012/cmselect/cmpubacc/c1050-i/c105001.htm](http://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.

7 Institute for Government, *System Error: Fixing the flaws of government IT*, March 2011, available at [www.instituteforgovernment.org.uk/publications/system-error](http://www.instituteforgovernment.org.uk/publications/system-error)

**1.6** In early 2012, we interviewed private sector technologists and project managers about their experience of introducing and using Agile in their organisations. We also drew on the knowledge of subject matter experts from professional service companies. Using this information we have identified some common themes about governance for Agile delivery. The case examples in this report illustrate how private sector organisations have developed their governance processes to support the successful delivery of Agile projects and programmes. The organisations were not the subject of National Audit Office audits. We do not conclude on which governance processes should be used in government.

**1.7** Appendix One outlines our methods. The key Agile terms and concepts we use in the case examples are listed in Appendix Two. Appendix Three shows how this report fits in with other National Audit Office publications on government ICT.

# Part Two

## Agile delivery 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.<sup>8</sup>

**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. It did recognise, however, that central government faces particular challenges if it adopts Agile methods because of the complex and hierarchical structures for governance and accountability and the organisational culture.

**2.3** In the *Government ICT Strategy*,<sup>9</sup> 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*.<sup>10</sup> 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.

**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](http://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/](http://www.cabinetoffice.gov.uk/content/government-ict-strategy/)

10 HM Government, *Government ICT Strategy- Strategic Implementation Plan*, October 2011, available at [www.cabinetoffice.gov.uk/content/government-ict-strategy-strategic-implementation-plan](http://www.cabinetoffice.gov.uk/content/government-ict-strategy-strategic-implementation-plan)

# Part Three

## Governance of Agile delivery

**3.1** Governance for ICT is for senior management to gain and give assurance that investment generates value to the business and reduce the risk of bad outcomes.<sup>11</sup> The processes senior management uses to do this vary between organisations and this report illustrates how eight companies have developed their governance for Agile delivery.

**3.2** Critics of Agile delivery say that the methods allow teams to work in an unstructured way, which prevents clear lines of accountability and discourages documentation. A survey in 2011 showed that the most serious challenges to using Agile delivery is the perception that management control is lost and the difficulty in changing organisational culture.<sup>12</sup>

**3.3** Proponents of Agile delivery argue that the methods rely on information on the current status of the project being visible to the whole business, instead of central processes for command and control. They also believe that, because the methods are designed to be self-assuring, there is proper governance and accountability built into Agile practices. In particular, control processes are more collaborative and are run continuously by the ICT specialists and the business owner of the product or service in the project delivery team. For example, generally accepted good practice in a small delivery team is for:

- the ICT specialists to review each other's work during each iteration. Team members repeatedly test that the system meets all the pre-agreed criteria for an acceptable product or service; and
- the business owner and the users to continually check that 'expected levels of quality' are reached and sign off products as complete at the end of each iteration. The ICT specialists are able to improve the product or service or take corrective action based on this user feedback and ensure they generate the value forecast in the business case. When the time or cost of developing a solution to a problem appears to outweigh the benefits, teams ask senior management to decide if the project should be re-scoped, paused or stopped.

**3.4** The Agile community recognises that multiple layers of governance do not necessarily improve the quality of technical solutions, speed up delivery or reduce risk. However, where an organisation is delivering a programme containing multiple projects or runs its business as usual operations through many Agile teams, some senior managers may need to have additional control processes. For example, they may commission audits to provide assurance that quality procedures exist and are effective, and that resources are being used cost-effectively and for their intended purpose.

11 International Organization for Standardization and International Electrotechnical Commission, *ISO/IEC 38500 Corporate Governance of Information Technology*, June 2008

12 Version One, *State of Agile Development*, Sixth Annual Survey, 2011, available at [www.versionone.com/state\\_of\\_agile\\_development\\_survey/11/](http://www.versionone.com/state_of_agile_development_survey/11/)



## Principles for governance

**3.5** We identified four principles that were frequently mentioned by our interviewees as being key to successful governance of Agile delivery:

- a** **Governance should mirror the philosophy of Agile methods – only do a task if it brings value to the business and does not introduce delays.** Governance should be light touch and proactive. It should also focus on what activity is taking place and the value of the services or products. This is in contrast to traditional methods which check what the delivery team has done to improve the predictions and estimates in the plan and reduce the variation between the baseline and forecast profile.
- b** **Agile delivery teams should decide on the empirical performance metrics they will use and self-monitor.** The overall aim is to improve the certainty teams have that they will deliver a usable product or service of good quality. Agile delivery is founded on the philosophy that teams should 'fail fast and learn quickly'. Teams quantify their performance and use the data to improve. For example they measure tasks completed; rework they had to perform; the backlog list and the value of the product or service to the business at the end of each iteration. Teams display this information visually, updating it frequently. This makes progress transparent to business users and management. If senior managers require performance information to oversee projects, they define what the 'must have' data are. Performance reports for senior management become a task in each iteration and an output of the delivery team.
- c** **Senior management, external assessors, business users and the ICT team should be partners in quality, and this collaborative approach is an essential change in mindset.** Once senior management has agreed the outcome for a business change project, the corporate goal for the quality of the service is fixed up front. Senior management approves spend by the delivery team at a particular rate over a set period of time to achieve that outcome. The business owner and delivery team defines what 'quality' tests they will use and what results are acceptable at the outset of each iteration – the definition of 'done'. Regular user feedback identifies whether the product or service is providing the expected business value at each stage. External assessors are not gatekeepers; rather they are an integral part of the team. The iterative approach ensures continual reviews and feedback on progress, so external assessors are not just involved at critical points as defined in a traditional project life cycle.

- d External assessment or reviews of Agile delivery should focus on the teams' behaviours and not just processes and documentation.** Assessors are more effective in providing critical challenge if they have high-end skills, including technical and Agile delivery experience. In addition, they provide better value if they continually review how the team is performing, using observation as their main method of evidence collection. Key lines of enquiry for assessors include:
- the skills and experience of the team;
  - the team dynamics – frequency and nature of communication inside and outside of the delivery team, and the level of input to the delivery team from the business;
  - the organisational culture – the level of commitment and openness;
  - the timing and nature of quality control by the delivery team – the testing and release framework;
  - the order in which the team tackled the tasks – prioritisation of actions and deliverables, the amount of actions in the backlog list;
  - the way the team changes its activity in response to the results achieved in each iteration; and
  - the value of outputs to the business.

# Part Four

## Private sector case examples

**4.1** In this part we illustrate how governance for Agile delivery is set up in seven private sector companies from a variety of business sectors. The companies have either won an award for Agile delivery or are well-known as users of Agile methods:

- British Airways plc (page 11).
- BT plc (page 13).
- Innocent Drinks (page 17).
- IBM United Kingdom Limited (page 20).
- A large UK manufacturing organisation (page 23).
- Simply Business (page 25).
- Vodafone Group plc (page 27).

**4.2** While the examples of governance we give are specific to a company's business, they illustrate practices that can be applied more widely. The descriptions of the features of the companies' governance processes in the case examples are not exhaustive.

### British Airways plc

**4.3** British Airways plc and its subsidiaries operate international and domestic scheduled air services for passengers, freight and mail. They employ more than 36,000 people across the world, with the majority of positions based in the UK. British Airways serves nearly 250 destinations and revenue exceeds £9 billion per year.

#### Supporting the business through Agile delivery

**4.4** In 2006, after a number of initiatives that increased the frequency of ICT projects being delivered, in time and to budget, British Airways staff still said that systems were not meeting their expectations. In particular, products and services were not getting to market quickly enough. In response the IT Department introduced Agile methods to some of its software development projects. The business units liked the idea that the solution could evolve as their requirements became more certain and they could stop the project at any point and still have a usable product or service.

**4.5** By 2009, the economic situation meant that British Airways needed to generate revenue fast. Senior management recognised how Agile methods could help with this problem and they were used in non-technology projects. For the Head of IT Delivery and Architecture the most persuasive evidence of the benefits of Agile methods for British Airways came from a project to introduce tablet computers to aircrew. The delivery team had the tablet computers in service after 90 days, and added more functionality at regular intervals.

## Approach to governance

### Board oversight

**4.6** Project teams would usually submit a full business case, containing the rationale, assumptions, benefits, risk mitigation strategy, cost estimates and technical design to its steering board for approval. With an Agile project this has been slimmed down to a one page commercial description, an estimate of the value of the product or service to the business, cost estimates for the team and proposed mechanisms to track progress.

### Performance metrics

**4.7** British Airways typically funds an Agile delivery project team for six months. The steering board tracks how quickly the team realises the benefits rather than how the benefits compare with the target in the business case. As a result, the delivery team is continually challenged to identify where the most value lies, prove that it is prioritising these features and quantify the value it is delivering in each iteration.

**4.8** For most projects in British Airways, the key constraint is the delivery date as the business will not get the benefits of a product or service if it is late to market. It therefore measures what user requirements were not delivered in the time period and what value was lost.

**4.9** Statistics such as the number of bugs in the software have not proved useful in monitoring performance on Agile projects. The number of bugs has remained unchanged; the difference with agile development has been that the bugs have been identified much earlier and fixed, so that their impact is reduced.

### Self-assurance by the delivery team

**4.10** British Airways has developed a 'suitability' matrix to help project teams and stakeholders decide whether Agile is the right approach. In a workshop, the team and stakeholders begin to define the risks, a clear shared objective and how permanent the solution will be. After this workshop, the delivery team begins the first iteration with some certainty.

## Lessons learned

**4.11 Do more** The IT Department told us it had become a partner in the audit and assurance process. As business units in British Airways have their own ICT budgets and commission work from the IT Department, they sometimes see Agile delivery as a way to reduce approvals processes. The IT Department works with the business unit and advises it on the processes with which it needs to comply before an Agile project can start.

**4.12 Repeat** Although British Airways has a framework with guidelines for teams starting an Agile delivery, we were told that a half-day Agile workshop involving all stakeholders is the most effective way to help teams set up their project. British Airways also uses Agile coaches to support teams working on the most critical projects for the first few weeks.

### Advice from British Airways on governance

**4.13** External assurers need to revise their tests to focus on how teams measure and demonstrate value. Agile methods force delivery teams to be disciplined, so there are management controls. The mechanisms take a different form and are in a different place in the organisation than is traditional.

**4.14** Daily stand-up meetings increase accountability as members of the delivery team must explain to each other how their individual tasks are progressing. British Airways recommends having a business stakeholder as a permanent member of the team because it builds better lines of accountability between the business and the IT Department.

**4.15** Make the production of a few specific artefacts part of the iteration plan and therefore tasks to be completed before the business owner can sign off the code. British Airways has found that the quality of artefacts, such as data storage diagrams, has improved because they are written in a timely manner and contain more detail.

**4.16** Visit other organisations to see how they use Agile methods and set-up governance. British Airways found this helped it ensure that the IT Department's recommendations were realistic and make informed decisions on implementing Agile delivery.

### **BT plc**

“It's more about being agile, than doing Agile. Everyone, involved, needs to understand this.”

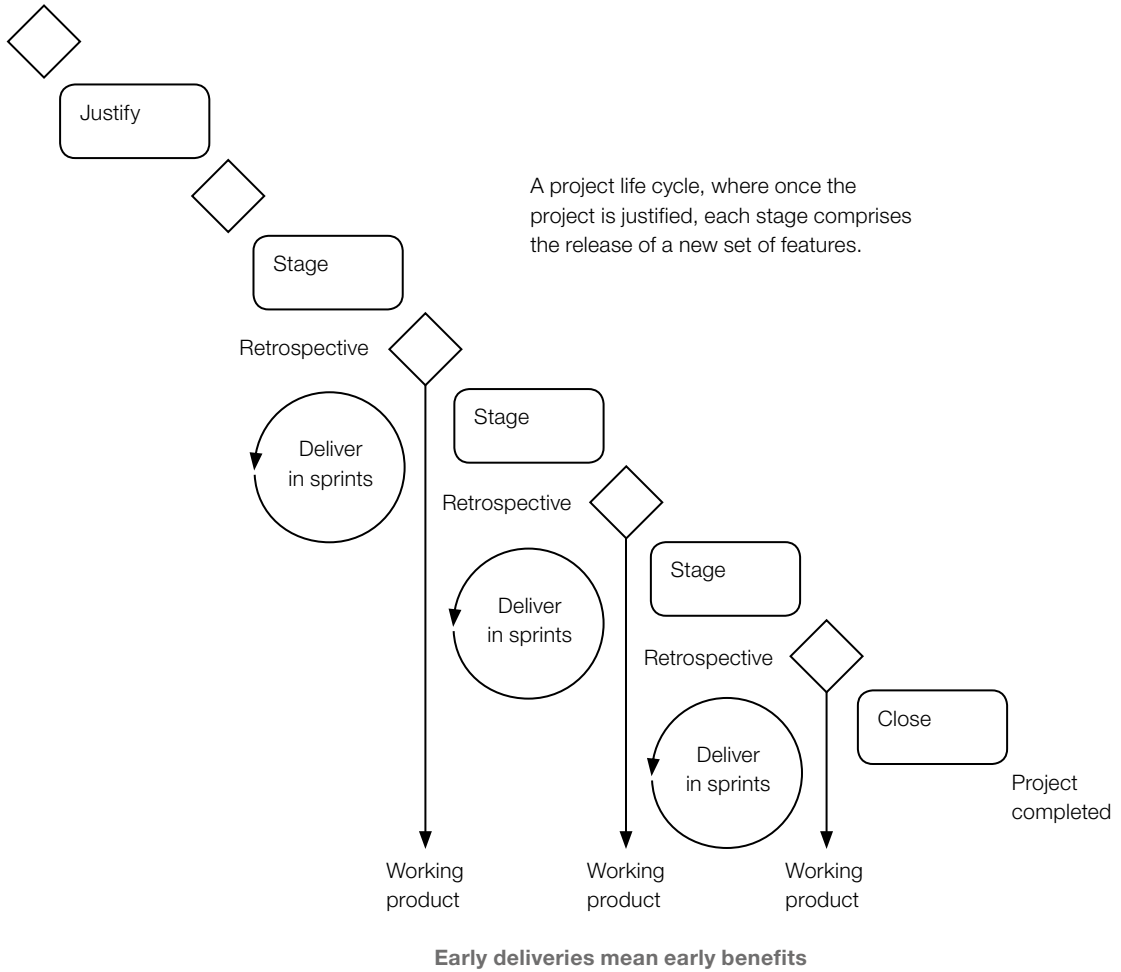
**4.17** BT provides communications services, including broadband, phone and digital television, for people in the UK, as well as mobile, security, networked IT and voice services for public sector organisations and businesses globally. It has eight major offices and 31 call centres in the UK, plus sites in 26 countries, and employs over 90,000 staff. BT operates in more than 170 countries with revenues exceeding £20 billion.

### Programme and Project Management Method for Agile delivery

**4.18** In 2005, BT's Chief Information Officer led an initiative to use Agile methods in software development more consistently. With the help of an IT consultancy, BT ran some pilot projects to understand which Agile methods would be useful and how it could confirm that delivery teams were being 'agile'. It also brought in external Agile coaches and paired them with BT staff. This work led to an 'Agile cookbook', a practical and pragmatic guide for teams using Agile delivery.

**4.19** For the past 18 months staff have been using the BT Programme and Project Management Method, which provides a governance framework, within which Agile delivery (releases and sprints) can be managed (**Figure 2** overleaf). BT is looking at how it can introduce Agile principles more widely to its business operations.

**Figure 2**  
Agile within BT's project-managed gated life cycle



Source: BT plc

## Approach to governance

### **Board oversight**

**4.20** The board still approves a project business case for an agile development, but it is less detailed than one for a traditional waterfall approach. The next board review is quicker in an Agile delivery and the board approves funding incrementally as each release becomes clear. For each release the board looks for assurances that the delivery team has, for example:

- the right scope for the next phase;
- delivered the right outcomes;
- not deferred the more problematical requirements to the end of the project; and
- an appropriate level of rework.

### **Assurance**

**4.21** External assessors of work delivered using Agile methods use observation to evaluate the team's way of working. Their assessment is not based on quantitative measures of performance – they judge whether the activity they have witnessed is characteristic of Agile and is of good quality. For example, they look for teams that are monitoring the value delivered by their activity, not the amount of activity. BT's internal audit provider has benchmarked performance on a sample of Agile deliveries each year since 2000.

**4.22** BT does test for compliance. For example, checking that the acceptance criteria for the end of each iteration include a document about the key areas, because it knows that the detailed information is in the code.

### **User involvement in assuring expected levels of quality are achieved**

**4.23** A member of staff from the business is involved with the delivery team throughout to provide input and user feedback to improve the system. BT encourages co-location of the business owner and the delivery team.

**4.24** The business owner prioritises the features of the system, but deadlines are only fixed for the most important because the team expects to exploit changes to deliver the most value through the project. When it becomes necessary to plan the work for an iteration, the business owner elaborates on a few features and how valuable they are so that the delivery team can prioritise. At the same time the business owner defines the acceptance criteria for the tasks in that iteration.

### **Self-assurance by the delivery team**

**4.25** BT delivery teams use an Agile 'information radiator' so that team members can keep track of the tasks and their delivery status. Data are posted on whiteboards or screens and include: burnup or burndown charts, test results and defects and lessons learned. The team uses automated and continuous integration testing so it can incorporate changes to the system safely and confirm that the tasks are complete.

### Lessons learned

**4.26 Repeat** BT will continue to support teams to communicate well, be efficient in their decision-making and work together. It does this by providing tools that make face-to-face communication and real-time collaboration, including video conferencing and Sharepoint, as easy as possible. It recommends that teams use them rather than email. Staff must get used to putting evidence of their work in a public space, rather than storing to it in their personal areas.

**4.27 Do differently** BT tried a central command and control approach to get teams to use continuous improvement techniques, like retrospectives. However, BT now rewards those that do change their practices rather than forcing the process on them.

**4.28 Next steps** Work to further improve the staff's understanding of Agile and when the methods are the most appropriate.

### Advice from BT on governance

**4.29** Start with a few projects and make sure that the most skilled and experienced staff are on the delivery teams. Encourage them to ask questions:

- Why am I doing this?
- How will I know I have done it?
- What is the value of doing it?

**4.30** Use prototyping events to show business staff the screen mock-ups or simulations before teams write any code for the actual system. This feedback will help to make sure that the delivery team is not starting off on the wrong track.

**4.31** Replace the single 'post-mortem' review of projects with regular retrospectives involving the project team and the business owner. These meetings provide a constructive way to resolve issues and risks as they arise and improve efficiency.

**4.32** With a more Agile way of working, internal and external auditors have to evaluate the current situation, rather than the past. Auditors will have a smaller number of different artefacts to examine, which the teams will have created to support their activity planning and that show their completed tasks. This is instead of documents that show that processes have been followed. These artefacts will not necessarily be the same for each team and there will be frequent changes to them as the delivery team receive feedback and learn.

**4.33** When changing the approach to quality management, BT found it a good idea to involve accreditation auditors early on in the process.



## Innocent Drinks

“Agile is helping us realise business benefits early and is motivating and empowering for the team: everyone wins.”

**4.34** Innocent Drinks is a UK-based company whose primary business is making healthy food and drinks, including smoothies, juice and veg pots. It employs over 250 staff in its London headquarters and offices across Europe. Innocent Drinks products are sold in outlets in 15 European countries and turnover is around £200 million each year.

### Delivering business change

**4.35** The idea for using Agile methods came from a member of the in-house development team. Innocent Drinks was delivering its IT projects with mixed success, and often the business had to wait for a lengthy period before realising the benefit of work. Also, on occasion, the end product did not fully meet with users expectations.

**4.36** In late 2009, the IT Development and central Major Projects teams moved to agile development practices. For example they break work down into iterations, hold daily stand-up meetings and have the tasks tested and verified by a business owner. These Agile practices are run within a bespoke project management process, akin to a slimmed down PRINCE2 control structure, and only start once senior management has decided to ‘commit’ to a project. The IT team found that the hybrid approach was advantageous as it allowed the rest of the business to become familiar with the concept of Agile delivery, without it being described as such.

**4.37** Innocent Drinks has since introduced a more formal Agile framework – Scrum. It has shifted its focus from metrics of cost, time and benefit, to place greater emphasis on this latter measure – the strategic business value to be gained from the project between the decision to commit and the closure point.

### Approach to governance

#### Board oversight

**4.38** Innocent Drinks has a central IT budget. Once the company board has approved the budget, the IT team and the business areas have some flexibility in deciding how to use the resources. The board will only review a specific project if the IT team and the business decide that it cannot be resourced from the existing budget.

**4.39** Steering groups and sponsors therefore oversee the IT work and they are involved at four key points.<sup>13</sup> The IT team and the business use a very quick concept phase to identify the scale of the cost, timing of the benefits and criteria for success. If this broad statement of project constraints and what it should achieve is agreed by the steering group and the sponsor, the delivery team do further work on the design and plan in more detail. The sponsor and the steering group then decide whether to commit to the project, agreeing the cost and resourcing.

<sup>13</sup> Decision Point 1 – concept approval, Decision Point 2 – commit to the project, Decision Point 3 – go live , Decision Point 4 – closure

**4.40** Throughout the project life cycle the steering group and the sponsor will check the project assumptions and benefit realisation (see bullet one, paragraph 4.41). The Change Advisory Board, comprising the change manager and senior IT staff, reviews the risk of releasing the change into the live environment when the delivery team think that their product increment is ready.

#### **Performance metrics**

**4.41** Innocent Drinks monitors performance on Agile projects in three ways:

- The steering group reviews each project against the usual measures of time, cost and scope and the benefits realised just prior to 'go-live' and at project closure.
- The business owner checks that user stories are prioritised based on the value to the business, interdependencies and risk. With the Scrum master, the business owner checks projections of velocity are achievable. They report back to the steering group.
- The project team measures day-to-day progress for its own purposes. The sprint backlog tasks are displayed on the team's whiteboard and each developer records their activity on the tasks. The team may also use a burndown chart.

**4.42** Innocent Drinks has multiple backlogs, covering live services as well as those for new development projects on which the IT team is working. Only one backlog is worked on in any given sprint. The IT team prioritises backlog activities based on the overall strategy for Innocent Drinks and the effort required to complete the task. Innocent Drinks believes the level of trust in the IT team and Agile methods has grown and the business benefits of activities are better understood. Therefore, the IT team does not need to justify its scheduling decisions in detail and the portfolio meeting, which exists to resolve conflicting priorities, has not often been needed.

#### **Assurance**

**4.43** At the close of a project Innocent Drinks holds a lessons learned review. This process does not drive change in the same way as the team's regular retrospectives, but provides input to be revisited during future project work.

#### **User involvement in assuring expected levels of quality are achieved**

**4.44** The sponsors trust the decisions on the detail made by their business owners. Generally the business owner position is filled by someone from the relevant business area. Although they do not leave their other responsibilities behind, the project is added to their objectives. When a member of the central Major Projects Team acts as the business owner by proxy for a business area, Innocent Drinks still makes sure that key users in that area feedback on the outputs from each sprint.

#### **Self-assurance by the delivery team**

**4.45** The iterative approach allows the delivery teams to control quality better. Teams can focus on a specific work stream until they have delivered a tangible output, rather than continually switching between urgent matters. The developers get a peer to review the design and quality of their code, before formal testing.

**4.46** The delivery team creates its own definition of what it means for work to be considered 'done'. This checklist is written up on the whiteboard so that the team can monitor the quality of the work and whether the products are ready for release. The definition of 'done' is reviewed by the team and adjusted every couple of weeks.

**4.47** In its retrospectives the delivery team puts forward improvements to the development and Agile processes and selects the top three ideas that it would be realistic to implement. These are also written up on the whiteboard to keep them fresh in people's minds.

### Lessons learned

**4.48 Repeat** The delivery team gives its business owner and users advance notice of any testing they are required to do so that they can organise their diaries. They are involved in other work but are needed in every sprint, either for testing or product review.

**4.49** Developers may challenge the business owners when they request a product or service be delivered by a certain date. Innocent Drinks believes that this is important as it allows the team to ratify a delivery date, or negotiate on scope to meet deadlines when necessary.

**4.50 Do differently** Innocent Drinks shortened its iterations from four to three weeks and the whole IT team works to this cycle. The business owners prefer having shorter sprints because they know that three weeks is the maximum they will have to wait for the delivery team to plan again and prioritise their urgent or unexpected work.

**4.51** The development team collectively now focuses on only one major project. Innocent Drinks considers that this facilitates the sharing of product knowledge, supports capabilities and allows the team to have more fun.

**4.52** As the Scrum master also heads up the development team, Innocent Drinks found that it required effort to make the daily stand-up meetings a vehicle for communication between the members of the project team. Staff initially used it as a way to update the stakeholders and the development team manager.

**4.53 Next steps** Innocent Drinks wants the business to see it as a positive if the sponsor stops a project at a concept or define phase. Leaving a project to run on when it is not delivering the expected benefits is a failure.

### Advice from Innocent Drinks on governance

**4.54** Invest in communicating with those involved in project assurance so they understand how Agile methods are different, what they should expect as artefacts and when they will be involved.

**4.55** Decide upfront if the service is likely to be short-term or become part of the company's infrastructure. The developers can then decide on an appropriate level of quality, and senior management can make sure that resources are directed to best effect.

## IBM United Kingdom Limited

**4.56** IBM is a global IT company that manufactures and sells products such as large enterprise business systems, microprocessor chips and business software and it provides infrastructure and hosting services. It also offers technology research and development and consulting and financing services. IBM UK employs around 20,000 staff who work at 25 offices. IBM operates in more than 170 countries, generating revenue of over \$100 billion in 2011.

### Disciplined Agile Delivery methodology

**4.57** IBM's use of agile dates back several decades. It uses Agile practices internally to develop and deliver commercial software products and to deliver bespoke solutions to clients. IBM believes Agile delivery allows it to continually issue new capabilities that meet user needs. It usually introduces software as part of a wider business change project so, to keep both in step, it has developed several Agile project methodologies. Disciplined Agile Delivery is a hybrid method that can be applied by a large number of teams working on the same project at the same time.

**4.58** **Figure 3** shows the Disciplined Agile Delivery life cycle. It starts with a few short iterations that allow the team and its stakeholders to identify the initial requirements, develop the architecture and agree a release plan. IBM also uses this to determine the system level properties and characteristics – the non-functional requirements. There are iterations after the business owner has decided that the system has sufficient functionality. These additional iterations are necessary for IBM to support the operation and maintenance of the solution once it is in service.

### Approach to governance

#### Senior oversight

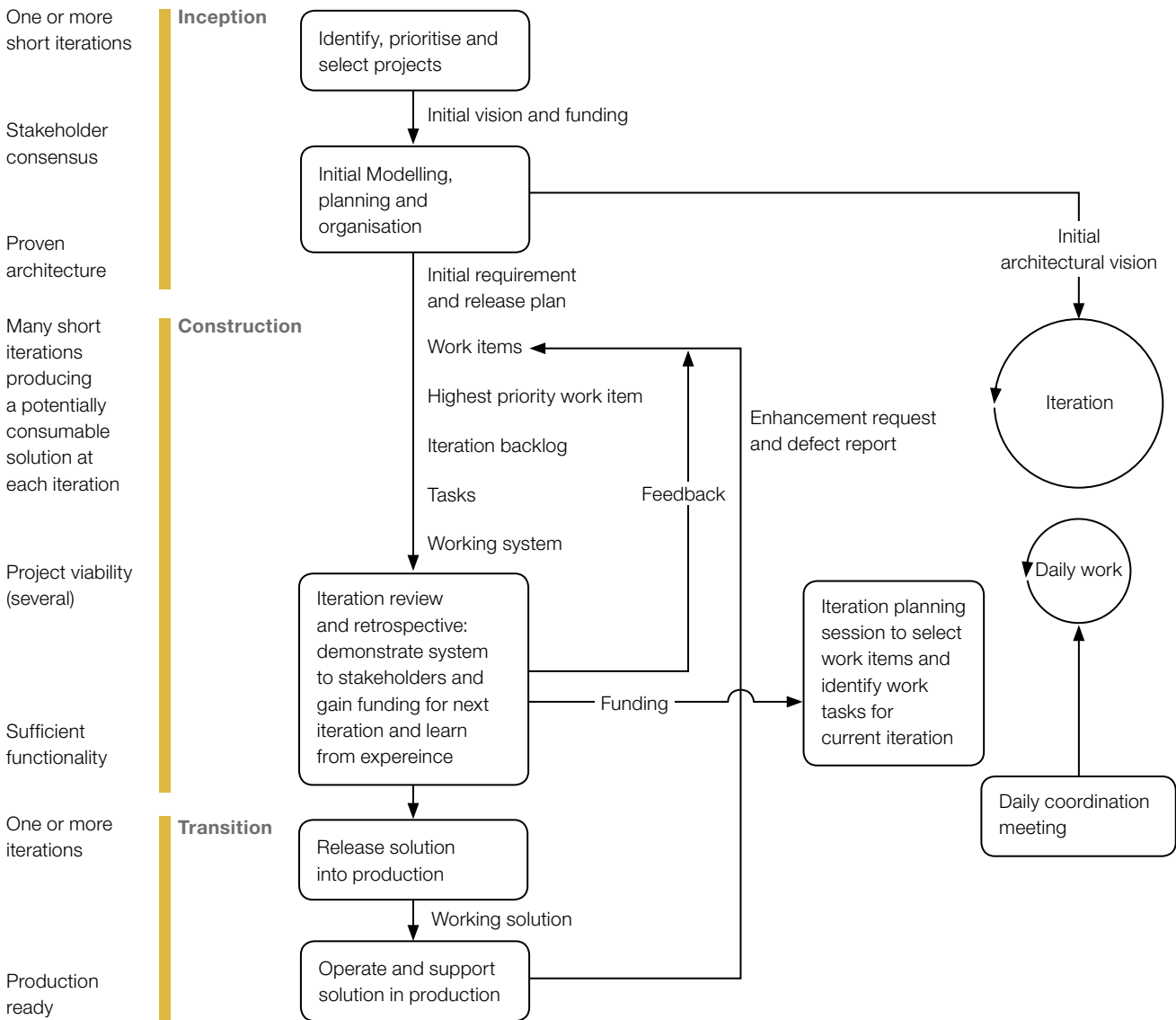
**4.59** IBM's governance strategy is to 'trust but to verify and then guide'. Senior managers are unlikely to have the time to attend the daily coordination meeting and listen to progress. Consequently IBM has explicit milestones during the project life cycle at which teams give consistent information on project status to the relevant parties. This reduces the risk that the project team fails to deliver the required functionality, without senior management being aware.

#### Performance metrics

**4.60** IBM has a framework for assessing performance. Delivery teams decide on the set of metrics that is appropriate for the characteristics and goals of their project.

**4.61** Senior management assesses the effectiveness of the investment in Agile projects, the level of future funding required and productivity in its reviews of performance. These assessments are similar to those for more traditional projects.

**Figure 3**  
IBM's Disciplined Agile Delivery life cycle



Source: IBM

**4.62** Steering boards review projects at four key points<sup>14</sup> and approximately every quarter during the construction phase. They look at a wider range of measures than senior management, including velocity, deployment, defect trend, code quality and test coverage, to check the viability of the project and manage reputational risk. The types of questions they ask are:

- Is the team working at sufficient pace to complete the work?
- Are new or changing requirements threatening the release date?
- Is the team working in a manner that will continue to result in sufficient quality?
- Is the solution of sufficient quality?

**4.63** The team tracks a more detailed set of metrics. For example, it will constantly examine the pace of its work because after the first iteration, it becomes more difficult to maintain velocity because of technical debt and blocking work items. Teams must monitor and manage these legacy issues otherwise they will adversely affect the outcome of the project.

#### **User involvement in assuring expected levels of quality are achieved**

**4.64** Sometimes the product or service user cannot be involved in the delivery team, for example citizens. In this case the team may use 'personas' to test its design decisions. A 'persona' represents a particular group of users, and is defined by a set of characteristics. The stakeholders imagine what 'John' would say about that feature or functionality of the system and provide feedback to the development team.

#### **Advice from IBM on governance**

**4.65** In contrast to the traditional approach of looking at outputs, plans, resourcing and how a project is organised, external assessors should focus on outcomes, prioritisation of work and team dynamics. The most useful indicators of success are how the teams are organising the delivery of an operational service or capability and what Agile behaviours and practices are used. Areas for assessment include whether:

- system level issues (security, availability) are addressed within the iterations;
- short- and longer-term planning exists;
- the stakeholders have a shared vision;
- there is continuous integration; and
- the team has the right people.

**4.66** Assessors should look in greater depth at the areas that pose more risk, such as deferred tasks; integration and release into the live environment; and team morale and staff attrition rates. Rather than looking for assurance that teams have followed processes, assessors should see demonstrations of the product to gain confidence that progress has been made.

<sup>14</sup> Checks for stakeholder consensus, a proven architecture, sufficient functionality and production readiness.

**4.67** Where an organisation uses contractors for Agile delivery, it should be asking itself:

- Do we know what the work items are and have good control over how they are prioritised and managed?
- Do we have good control over the management and quality of our assets? Are all requirements, the source code, test scripts, etc stored in our central repository so that we can run verifications and scans?
- Do we know the build process is being managed effectively? Are breaks in the build slowing progress and is continuous integration showing that the architecture and infrastructure are stable?

### **A large UK manufacturing organisation**

“I was sceptical, now I would fight ‘tooth and nail’ anything that threatened working this way” Computer Aided Design Capability Lead.

#### Agile delivery

**4.68** The organisation ran a global business change programme to develop processes to manage aero engine data from the design, manufacture and maintenance phases. The initial project started in 2007 and the team delivered the requirements using the Agile approach to time and budget – 14 months and around £30 million.

**4.69** The IT Project Management Office Director chose to use an Agile approach based on the Dynamic Systems Development Method (DSDM). This method was the most suitable of the well-known methodologies, because of its perceived fit with the culture in the organisation and because the project did not involve software development. DSDM in contrast to other methodologies has a strong focus on project initiation and it is not aligned to any specific software development approach.

#### Approach to governance

##### **Board oversight**

**4.70** The IT Project Management Office Director adapted the traditional approach for the Agile project. He scheduled risk reviews to coincide with the end of each time box, instead of following the monthly cycle typical for other projects and used the three governance boards as follows:

- **Capital investment committee** – approved the investment based on a statement of the delivery of high-level outcomes from the project and its alignment with the engineering strategy. There was no need for the project team to rewrite or resubmit the business case as the solution was designed and refined.
- **IT board** – although the scope of its reviews at the four decision points (gates) remained fixed, the project team changed the timing to suit the Agile process. For example, the board reviewed the design of the solution later in the project life cycle than normal.
- **Major projects board** – received a new style of monthly reports from the project team (see paragraph 4.71) and documents such as the business architecture definition as and when appropriate. Members rarely questioned these reports as they were being made aware of progress via the feedback loops in their business areas.

### Performance metrics

**4.71** The monthly reports for the major projects board changed from percentage complete to metrics such as:

- the number of requirements delivered in each period of four weeks (the time box);
- the backlog;
- business benefits expected and realised; and
- defect reporting.

### Assurance

**4.72** The organisation carried out a standard post-implementation review on the Agile project. Auditors had ample evidence for their review because each business owner had signed off that intended outcomes had been achieved with the expected quantified benefits.

### User involvement in assuring expected levels of quality are achieved

**4.73** Senior stakeholders (directors) agreed the prioritisation of the requirements. Initially the stakeholders classified all 115 requirements as 'must have'. Agile coaches recommended the number of 'must/should have' should be between 40 and 60 per cent of all requirements. So the senior stakeholders re-prioritised, fixing 12 'must have' requirements. The project team had the flexibility to prioritise the remaining requirements.<sup>15</sup> The organisation linked every prioritised requirement to a specific outcome benefit, which was measured and signed off by its respective business owner once the new business process was operational.

### Lessons learned

**4.74 Repeat** The organisation will continue to make the governance 'gates' flexible – these reviews and decision points should be made to fit with actual deliverables defined for each time box.

**4.75 Do differently** An enterprise architect should have been a permanent member of the project team and a technical specialist involved in the assurance reviews during the project. There were insufficient staff available at the time.

### Advice from the organisation on governance

**4.76** Before the start of the project, invest in educating board members, programme managers and teams about Agile delivery and how project reporting will need to differ.

**4.77** External assessors should focus on how people behave during the project instead of checking that people followed the processes after the project has finished:

- Is the organisation and/or team adhering to the Agile principles as defined by the business?
- Is there regular high-quality communication between people?

<sup>15</sup> Requirements were grouped as: 45 'should have', 54 'could have' and four that would not be delivered.



**4.78** Documents that are valuable evidence for the project include those that:

- contain the decisions of the main stakeholders on the relative importance of requirements;
- describe the link between each requirement and an outcome benefit; and
- show the relevant business owner has signed off each requirement as being delivered and the quantified benefit that it has achieved.

### Simply Business

“Auditors should not require complex metrics to know Agile projects are in trouble.” Simply Business Chief Technology Officer.

**4.79** Simply Business<sup>16</sup> is a UK independent brokerage service that provides tailored business insurance quotes, as well as specialised finance. It has offices in London and Northampton and employs 160 staff. Simply Business insures 200,000 small businesses and had a turnover of around £20 million in 2011.

### Reinventing business insurance with Agile delivery

**4.80** The Chief Technology Officer (CTO) chose Agile methods to help Simply Business to deliver change rapidly that was in line with the needs of an online business. Simply Business tested Agile methods on its most important project. It then rolled them out swiftly to all areas of IT, including development and maintenance of its infrastructure.

**4.81** Simply Business did not choose a single Agile methodology. It drew on the CTO’s experience combined with expert Agile coaches to try out a variety of Agile practices. If there was no benefit from a particular approach then the IT team stopped using it and tried another.

**4.82** The current Chief Executive Officer (CEO) supported Agile methods because they align with his vision to create an innovative and entrepreneurial culture. Simply Business has been using Agile for fifteen months and it is standard practice in project work and business as usual operations.

### Approach to governance

#### Senior oversight

**4.83** The CEO and Chief Operations Officer attend the weekly planning meetings run by the CTO. Together they check continuously that the service or product being built provides value for the business. If a project is not meeting the needs of customers<sup>17</sup> and/or the business or fails to deliver expected benefits, they will stop it. This decision is reviewed during bi-weekly prioritisation meetings. By using Agile delivery, Simply Business focuses on allocating resources to the most important projects at a particular time.

**4.84** Simply Business also has a developer council, comprising the most senior developers. Any issue that cannot be resolved by the teams is escalated to this council.

<sup>16</sup> The trading name of Xbridge Ltd which is regulated by the Financial Services Authority.

<sup>17</sup> A customer is an individual or company that purchases the product or service.

### Performance metrics

**4.85** In the daily stand-up meetings the teams and the CTO review progress across all the projects, discuss issues and prioritise the next steps. They measure progress by monitoring the number of user stories completed each week and assess whether the user stories were prioritised in the correct order.

**4.86** To quantify the value of a new service or product and whether it has been worth the investment, Simply Business is using a 'Lean Startup' approach. Projects start with a 'leap of faith' hypothesis, such as "We believe brokerages would be eager to use our platform". Based on that hypothesis, they decide on measures that prove it and build something that will most quickly demonstrate it.

### User involvement in assuring expected levels of quality are achieved

**4.87** Simply Business involves representatives from across the organisation at the outset to identify what customers and the business need from the service or product. The developers look at the business processes and build technology to speed them up, rather than designing a machine to fully automate the complex business algorithms.

### Self-assurance by the delivery team

**4.88** Trained quality assurers work across a number of the Agile delivery teams. Although they are responsible for designing the acceptance tests for the software during the development, they also help embed the principle of quality throughout project delivery.

**4.89** Simply Business promotes a culture where mistakes are allowed and learned from. The teams hold bi-weekly retrospectives to improve performance, talking honestly about how well the sprint has gone from a technical perspective as well as how they worked as a team.

### Lessons learned

**4.90 Repeat** Create proper cross-functional teams where the business owner is available full-time because Simply Business has found significantly better outcomes occur. Of late, collaboration has evolved such that the business owners contributed directly to the code base of a project and the developers are perceived as an integral part of the business areas and not as a corporate service.

**4.91 Do differently** The teams were not prioritising technical debt effectively. Recently Simply Business stopped all work on the projects to fix the continuous integration build, so that the teams could have greater confidence in the automated tests.

### Advice from Simply Business on governance

**4.92** External assessors should:

- observe how staff behave;
- interview people in the team to identify if they are sufficiently involved, particularly that the business owner is spending at least 50 per cent of their time with the team;
- look for evidence that the team is implementing lessons learned; and
- check that the team has created functionality that is production ready within weeks of inception of the project and that it continues with the releases throughout the project.

## Vodafone Group plc

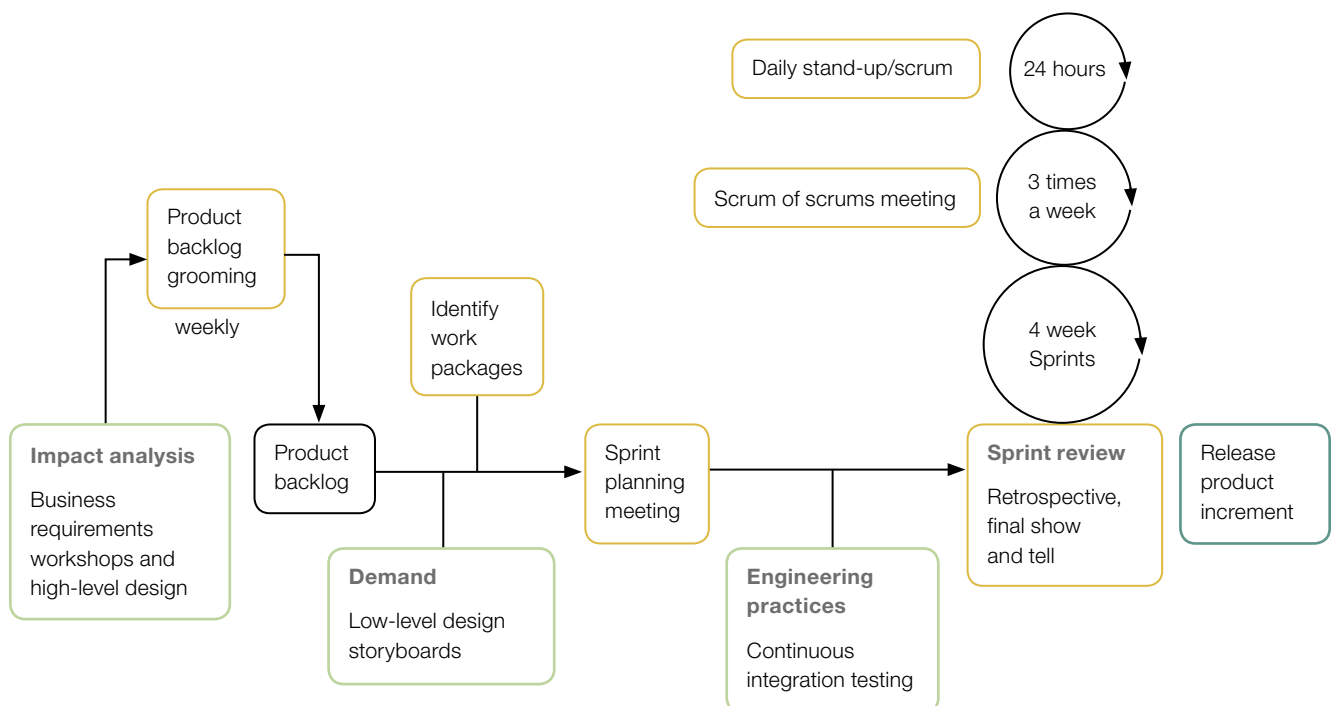
“Agile is a vehicle to transform the delivery relationship between the business and IT. It is faster and delivers much more value for money. It changes the roles of everyone involved and shatters traditional IT norms. It is not for traditionalists....” Vodafone UK Chief Information Officer.

**4.93** Vodafone Group plc provides global network infrastructure, handsets, smart devices and fixed and mobile communication solutions for businesses and citizens. It has 10,000 staff in the UK, based at five main sites and 300 retail stores. Vodafone Group plc operates in over 70 countries and its revenue in 2011 exceeded £45 billion.

**4.94** Vodafone has been using Agile approaches in the UK for the past three years to deliver online services. Since January 2010, Vodafone UK has preferred to use Agile. It believes Agile methods have improved productivity and the quality of deliverables, increased stakeholder engagement and reduced time to market. For example, the web portal development programme team now delivers ten new features to the website every year, instead of four, and in eight weeks rather than 24.

**4.95** **Figure 4** shows Vodafone UK’s approach for agile development, used by over 150 staff. This Agile approach is integrated with the more traditional gates in the Vodafone Project Delivery Lifecycle.

**Figure 4**  
Vodafone agile development process



Source: Vodafone

## Approach to governance

### Senior oversight

**4.96** In addition to a project/programme board, Vodafone UK has an eTech governance group with representatives from the business areas (such as online services) for each agile development. This group ensures that the agile development is in line with current business strategy.

### Performance metrics

**4.97** The project/programme board does not review the detail of team and/or supplier performance. Instead it focuses on the value being delivered in the Agile Development Unit<sup>18</sup> and the cost of the delivery process.

**4.98** There is a 'scrum of scrums' meeting, where representatives of all the development teams involved in an Agile Development Unit meet to review progress and solve issues preventing progress. Some measures of performance used by development teams are:

- length of time to implement a user story (cycle time);
- velocity; and
- the cumulative number of stories accepted for delivery, in progress, and completed (iterative cumulative flow).

**4.99** The performance dashboard for suppliers is similar to the one for development teams, but also includes indicators such as iteration quality and defect counts. Vodafone UK holds weekly progress meetings with suppliers to deal with any issues that are blocking progress.

### Assurance

**4.100** Every three months Vodafone UK's agile development teams are independently audited. **Figure 5** sets out the maturity scale against which the teams are scored. The results can help teams focus on the most important Agile behaviours such as providing continuous satisfaction to customers and business users.

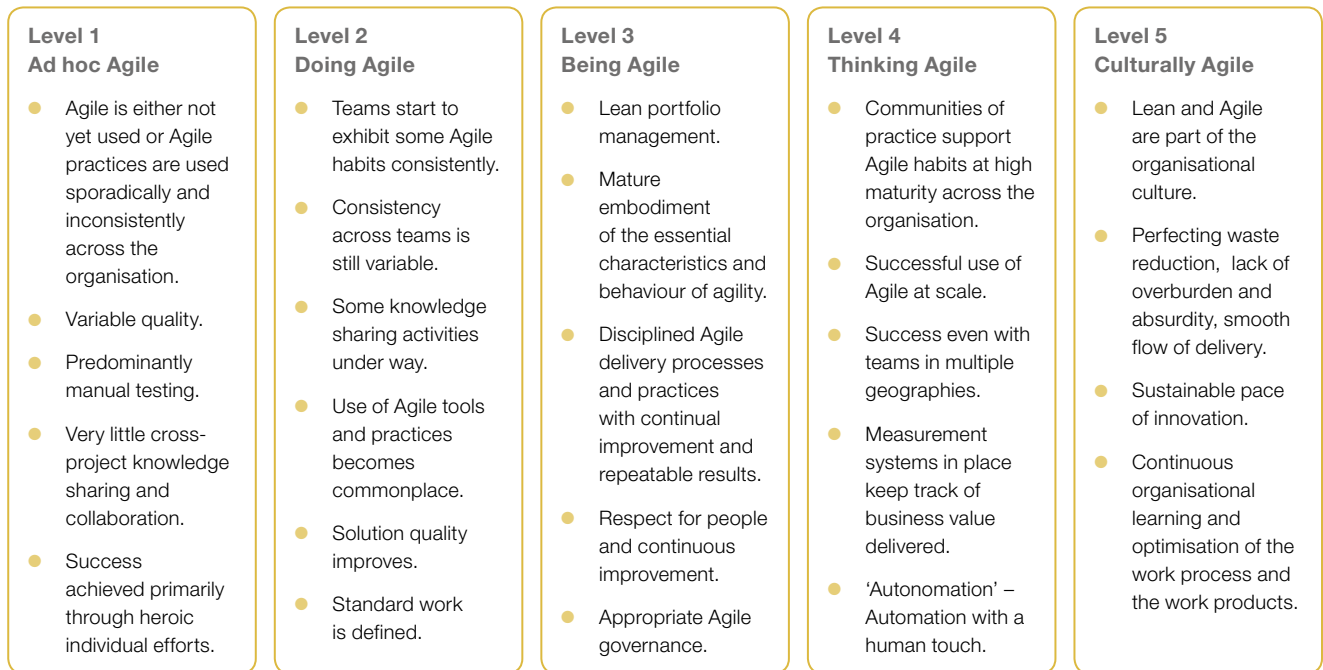
### Self-assurance by the team

**4.101** Code is continually tested overnight using automated tools. Where the code is overly complex, poorly written or contains security vulnerabilities, the developers automatically receive emails so that they can fix the defects the next day. Previously there could have been over 150 low priority live defects on the web portal project, but through Agile teams producing high quality outputs new defects are rarely if ever added. Vodafone UK reported the active defect list has remained at five or less for the past 14 months.

**4.102** This continuous testing has increased the quality of the deliverables and Vodafone UK considers that the Agile approach is delivering better value for money. It has halved the costs of the testing and release phase for the web portal project because the team did not need a four-week production and post-development stage.

<sup>18</sup> The term Agile Development Unit is used to describe a situation where agile software development has transitioned from small projects to cover large-scale enterprises.

**Figure 5**  
Maturity index for cultural agility



Source: Hewlett-Packard and Vodafone UK

### Lessons learned

**4.103 Repeat** Vodafone UK believes continuous integration, continuous testing and continuous deployment have transformed the quality of deliverables and simplified the release and deployment process. It would recommend adopting these practices even where deployment cycles are longer and releases contain more than one iteration of development.

**4.104 Do differently** Vodafone UK no longer measures the number of function points being delivered, because it did not add any value to the final product or service.

**4.105 Next steps** Vodafone UK is working to improve the match between the standard Vodafone Project Delivery Lifecycle (VPDL) and agile developments:

- The scope of an agile development project is adapted to meet emerging requirements and business needs, so the deliverables may not conform to the predetermined order expected in the traditional gated approach of VPDL.
- Agile development teams build up and prove a design of a product or service, so the traditional approach for an up front financial approval for a detailed design is optimal.

### Advice from Vodafone on governance

**4.106** Continually find ways to cut out user stories that do not directly meet the needs of the user so that planning is efficient.

**4.107** For good governance it is critical for organisations to have an Agile management tool that teams can use with the minimum amount of effort to provide the level of tracking, transparency, analysis and graphical reporting needed by the business.

# Appendix One

## Methods

**1** In January 2012, we conducted Internet-based research to identify private sector companies with experience in Agile methods. The companies we contacted have either won an award for Agile delivery or are well-known as users of Agile methods.

**2** The organisations cover different industry sectors, include small- and medium-sized enterprises and have been in business for varying numbers of years. British Airways plc, BT plc, the British Computer Society, Connections, a large banking and financial services organisation, IndigoBlue, Innocent Drinks, IBM United Kingdom Limited, KPMG, LateRooms.com, a large UK manufacturing organisation, PricewaterhouseCoopers, Quantum of Value, Simply Business and Vodafone Group plc contributed to our report.

**3** We interviewed chief technology officers and directors of project management about the products or services they were delivering using Agile methods. We developed a topic guide for the semi-structured interviews on governance. The topics included: quality control; quality assurance; accountability; board oversight; performance measurement and lessons learned. Where possible, we observed Agile practices used by the companies, including:

- daily stand-up meetings;
- iteration and release planning;
- visual displays of task allocation, progress charts and prototype products; and
- collaborative work areas.

We also asked consultants on Agile to describe what checks and assurance processes organisations typically use to make sure Agile projects are successful. We held the face-to-face or telephone interviews between February and May 2012.

**4** Using this information we have extracted some common themes about governance for Agile delivery. We do not conclude on what processes should be used in government. From the interviews with companies using Agile methods we have produced a series of case examples, which may help government organisations when setting up their own projects.

# Appendix Two

## Key Agile terms and concepts

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**Agile coach**

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

**artefacts**

Documents or visual depictions of work items, progress, features, the code base, etc.

**automated integration testing**

Where individual software modules are automatically combined and tested as a group.

**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.

**business change**

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

**burndown chart**

A visual representation that shows work remaining over time.

**burnup chart**

A visual representation that shows work completed over time.

**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 base**

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

**code quality**

The fitness-for-purpose of the instructions to the computer.

**continuous integration**

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

**cross-functional team**

A group of people with different skills and expertise working towards a common goal.

**defect trend**

A report that shows a rolling average of the number of problems (bugs) the team has opened, resolved and closed.

**deployment**

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

**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'.

**elaborate**

Where the delivery team adds detail to high-level business requirements.

**function points**

A unit of measure to express the amount of behaviours an ICT system provides to a user.

**functionality**

The behaviours that a computer system is designed to achieve.

**information radiator**

A large, highly visible display which gives a picture of progress and key issues relating to an area of work.

**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.

**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 the members 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.

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**scrum of scrums**

Daily meetings that allow clusters of teams to discuss their work, focusing especially on areas of overlap and integration.

**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.

**source code/code**

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

**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 coverage**

The proportion of a programme that has been assessed.

**test script**

A set of instructions to assess if a system behaves as expected.

**testing**

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

**time box**

A fixed time frame, usually to undertake an intense increment of work.

**user story**

A high level business requirement that is focused on an outcome.

**velocity**

The rate at which a team completes work.

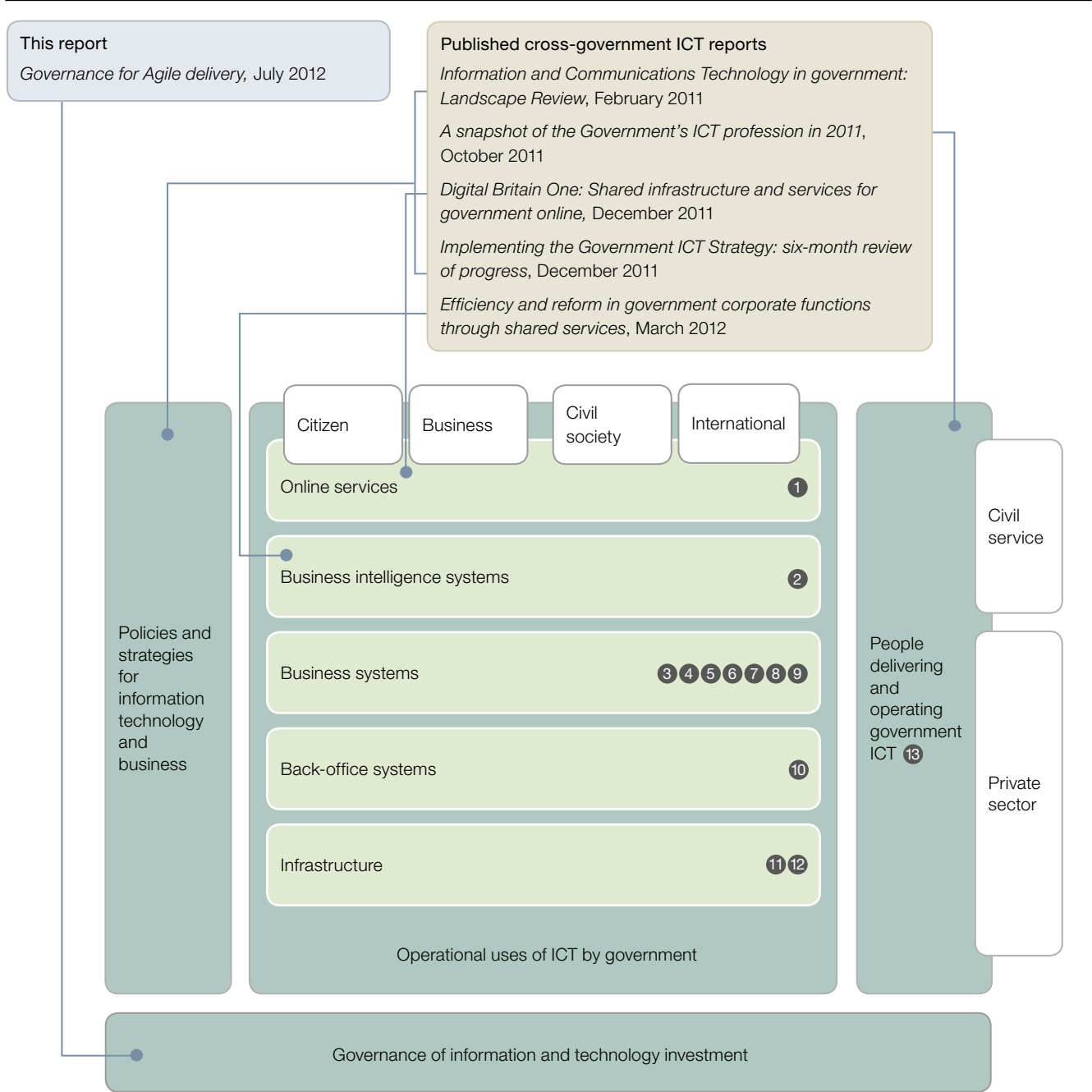
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# Appendix Three

## 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 opposite 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](http://www.nao.org.uk)**

If you would like to know more  
about Agile delivery, please email:  
**[ictauditcontactpoint@nao.gsi.gov.uk](mailto: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](http://www.nao.org.uk)**

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