INSIGHT

Good practice guide

Use of Agile in large-scale digital change programmes

A good practice guide for audit and
risk assurance committees

OCTOBER 2022

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Introduction

1   We have produced this guide to help audit and risk committees ask appropriate questions of their organisation's management when undertaking large-scale digital change programmes using agile methodologies. This guide is especially relevant where these methodologies are cited as a means of achieving ambitious objectives quickly. Senior non-specialist leaders in departments who deal with major change programmes will also find benefit in noting the points below.

2   Agile ways of working emphasise flexibility and iterative delivery for certain types of change. Understanding what is appropriate assurance over the management and control of Agile change, in this context, is crucial. Agile is often cited as being different compared to situations where more 'traditional' and familiar governance arrangements are in place. This implies a looser way of governing for Agile that is not justified. Clarity on assurance arrangements is still vital.

3   Our aim is to support audit committees and senior leaders who may feel that Agile introduces uncertainty and relative novelty to large-scale digital business change, to help them understand and appropriately question the senior management and governance bodies of Agile development and delivery within their organisations.

4   This is not intended to be a discussion of the merits of Agile relative to other approaches to software development. Nor is this guide aimed at practitioners undertaking projects using Agile approaches, and we do not discuss different agile methodologies.[1,2] These are both areas where more specific good practice guidance is readily available elsewhere. Our guide is intended to shine a light on the issues that arise and questions to ask when Agile approaches in general are applied beyond software and technology development to more extensive digital business change programmes.

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1   For example, from organisations such as APM, DSDM, PMI and others.
2   Methodologies include Scrum, Kanban, Lean, eXtreme Programming and Scaled Agile Framework (SAFe).

What is Agile?

5   Agile has its origins in software development as a simple set of principles that value flexibility over rigidity. Agile approaches based on iterative delivery are sometimes seen as an alternative to established practices which focus on understanding the full detailed requirements and all the various elements which need to be understood before the start. These include the complexity of the business and systems environment and the overall business and systems design. So-called 'waterfall' methods complete each stage of development before progressing to the next against an overall design so that the dependencies and risks are well understood.

6   Agile digital programmes should also develop the overall requirement and high-level design at the outset so that the risks and dependencies are understood. However, this is often overlooked under the false premise that Agile does not require it. The Agile Manifesto principle of preferring working solutions over comprehensive documentation does not mean that documentation is an optional extra. Some documentation is essential. Large-scale major digital transformation programmes are highly complex and require much up-front thinking. Once this is done, Agile can be used for specific elements of a programme which can be advanced quickly, such as building a web front-end on an existing system.

How is Agile used?

7   Agile has become the approach of choice for much software development. It is flexible, quick and can deal with requirement ambiguity. It can get the best out of development staff who are empowered in teams to produce basic working products earlier in the programme's life, which can then be expanded and enhanced in further iterations.[3]

8   There is no 'one size fits all' with Agile. It is well-suited to situations where simplicity and flexibility are called for and where there are few large and complex dependencies. This does not, however, mean that Agile is 'better' than other approaches in every situation and for every organisation.

9   Agile approaches in the public sector have run into difficulties when applied to more complex digital business change programmes. The way Agile is applied at large scale is often found wanting, such as in transformations which involve migration from legacy systems and where a wide range of interactions, interfaces, dependencies and other complexities are the norm. Complex governance in large programmes with both Agile and non-Agile components involved and the associated impact on stakeholder communication is another area of risk.

3   Often termed 'minimum viable product'.

Why this issue requires attention

10 Agile is now widely used across the public sector and, for central government, has been mandated by the Central Digital and Data Office (CDDO) through the Service Manual, supported by its Service Standard and the Technology Code of Practice.[4] These are reinforced by Cabinet Office spending controls for digital and technology-related expenditure. Agile is therefore central to the delivery of digital change in government services.

11 While there have been many successes, these have been mostly at a smaller scale, involving relatively straightforward services with simpler project governance and a level of autonomy for the Agile teams. Examples include the Department for Environment, Food & Rural Affairs' (Defra's) development of new systems to meet the additional responsibilities taken on following EU Exit.[5]

12 Agile failures have been mostly in larger-scale programmes, which have greater risks. They involve longer lead times and often require substantial integration of multiple products with legacy systems and high levels of complex change. Examples include Defra's Common Agriculture Policy delivery programme.[6]

13 Public bodies and their programme delivery partners need an adequate shared understanding of what is involved in an overall sense from the outset and a willingness to explore this understanding collaboratively. Without this, there can be adverse effects on commercial arrangements, including any supplier contracts. This can lead to contractual issues where detailed understanding and requirements emerge later during Agile development, and the implications can be costly for all concerned. Delays or quality issues can also arise unless these factors are anticipated and reflected in the contracts.

14 Proponents of Agile methodologies advocate that these can work at scale and point to particular methodologies designed for this purpose.[7] Mostly these successes have been in mature organisations in the commercial sector, which have made the appropriate cultural shifts in respect of leadership, governance, orientation and sourcing of skills to create an environment where success is more likely.

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4   Service Manual – Agile Delivery – "You must use the Agile approach to project management to build and run government digital services." Service Standard 7 – Use Agile ways of working; Technology Code of Practice, point 13 – Meet the Service Standard. Available at www.gov.uk/service-manual (link accessed 21 September 2022).

5   Comptroller and Auditor General, *Progress in implementing EU Exit*, Session 2017–2019, HC 1498, National Audit Office, September 2018.

6   Comptroller and Auditor General, *Early review of the Common Agricultural Policy Delivery Programme*, Session 2015-16, HC 606, National Audit Office, December 2015.

7   For example, Scaled Agile Framework (SAFe).

15 Based on our work over a number of years we do not for the most part see these conditions for success evident across government and the wider public sector, particularly where the starting point is complex legacy systems that need modernising. Examples include Universal Credit, the Common Agricultural Programme delivery programme, and the examples cited in our report on *The challenges in implementing digital change* (2021).[8] It should be noted that the Department for Work & Pensions did subsequently improve its application of Agile methods in later years following initial difficulties relating to Universal Credit.

Why audit committees need to be aware of the risks arising from the use of Agile

16 Government's guidance to audit committees makes clear that service delivery is an area of management activity that they should scrutinise carefully, including any changes to the service and the approach adopted to implementing that change. The *Audit and risk assurance committee handbook* states "the committee will also need to act as the conscience of the organisation and to provide insight and strong constructive challenge where required, such as on risks arising from ... new service delivery models."[9] This means that there is an important role for audit committees to play in understanding whether their organisations are adopting a clear approach to Agile, including its selection, operation, assurance and overall engagement and management.

17 There is no explicit reference to Agile in the handbook itself. Our guide therefore aims to equip audit and risk committees to ask informed questions of their organisations' management to fulfil the insight and challenge role with which they are charged. In doing so it supports our *Audit and Risk Assurance Committee effectiveness tool*, which provides a way for committees to assess their effectiveness against more than just the basic requirements: it provides aspects of good practice to give Audit Risk and Assurance Committees greater confidence and opportunity to meet the requirements of their role.[10]

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8   Comptroller & Auditor General, *The challenges in implementing digital change*, Session 2021-22, HC 575, National Audit Office, July 2021.

9   HM Treasury, *Audit and risk assurance committee handbook*, March 2016. Available at www.gov.uk/government/publications/audit-committee-handbook (link accessed 21 September 2021).

10   National Audit Office, *Good practice guide: Audit and Risk Assurance Committee effectiveness tool*, May 2022.

What we have found through our work

18   Agile methods can exacerbate problems when the complexity of programmes is not sufficiently understood. Simple iterative approaches cannot provide practical solutions where the architectural foundations are complex, missing or insufficiently developed, or back-office integration is not achievable. Organisations using Agile principles and approaches in the context of significant business programme change need to support them with appropriate approaches such as developing interim and target operating models. It also means having appropriate business and technical architecture in place. Digital leaders have told us that programme teams often neglect long-term planning and programme management good practice because of the apparent simplicity and flexibility offered by Agile methods.

19   In complex programmes it can be harder to see if Agile methods are working appropriately than is the case with waterfall methods. Detailed planning is still needed and it can sometimes be harder to see what overall progress is really being made. Without the necessary planning and programme management, departments will struggle to make Agile work at scale or know how to intervene early if progress is not on track.

Where has Agile worked well?

20   Agile has been seen to work best in smaller-scale systems implementations when there is an understanding between stakeholders that the underlying complexity of existing systems is not required to be addressed. In this scenario, some quality issues could be postponed or accepted as risks to be managed or mitigated where possible in pursuit of a basic workable system.

21   The COVID-19 pandemic gave rise to circumstances where this was necessary. The development by HM Revenue & Customs of the furlough support schemes is an example. The Committee of Public Accounts said "The Departments have shown great agility in implementing the employment support schemes quickly in response to COVID-19.... Departments showed the immense value of close co-operation, not just between government departments but also between policy and operational colleagues.... Departments also deserve credit for the time and effort invested by staff in the initial period to ensure that the schemes were designed and implemented quickly."[11] But there were risks taken. The Committee of Public Accounts also said, "Departments will not know the actual levels of fraud and error within these schemes until 2021."

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11   HC Committee of Public Accounts, *Covid-19: support for jobs*, Thirty-Fourth Report of Session 2019–2021, HC 920, December 2020.

What are the difficulties in using Agile for large-scale programmes?

22   When developing citizen-facing online services government frequently uses Agile approaches, based on rapid collaborations. Design and delivery teams are used to operating in this way to produce minimum viable products that are tested and assured, and which work in practice and deliver value, often in standalone mode.

23   Where the value of the Agile approach is less evident is at large organisational scale, involving multiple back-office legacy systems, which are invariably complex, particularly in respect of integration and joining up data. In these cases, the transformation needs to involve people and processes, not just the technology. It also needs appropriate organisational governance and leadership.

Our guidance

How this guidance links to other guides

24 We are not seeking to endorse or critique any particular approach to introducing digital change. Agile is one approach and the sequentially staged waterfall approach is the most recognised alternative. Neither is inherently better or worse than the other – what matters is that they are applied appropriately in context, sometimes together, and that they are suitably resourced, governed and managed.

25 Our aim is to help ensure that the approach is applied well. As such, we see this guide as complementary to existing guidance.

Questions audit and risk committees could ask

26 In the section below we set out high-level questions supported by more detailed sub-questions.

27 As part of their assessment, audit and risk committees should consider the quality of the evidence underpinning the assurances provided by management. One of the cornerstones of the Agile philosophy is a preference for working solutions over comprehensive documentation. However, this normally applies to relatively straightforward software developments and does not mean that in more complex change programmes planning and design documentation can be omitted or be superficial or lightweight.

28 The Infrastructure and Projects Authority (IPA) has published guidance entitled *Assurance and approval for Agile delivery of digital services*.[12] Evidence of review by the IPA and the results of those reviews would also be of value. Other assurance might also be available from internal audit or independent external consultants.

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12 Infrastructure and Projects Authority, *Guidance for Departments and review teams: Assurance and approvals for agile delivery of digital services, version 1.2*, October 2021. Available at www.gov.uk/government/publications/ assurance-for-agile-delivery-of-digital-services (link accessed 21 September 2022).

Question 1

29   Has the organisation assessed whether Agile is the most appropriate approach for the nature and scale of change being undertaken?

- Has the organisation clearly articulated the breadth of scope and complexity of its programme?

- Has proper consideration been given to alternative approaches?

- Has the culture of the organisation and its capability to deliver Agile been considered?

- Have stakeholders been consulted on what they need and want?

- Have the lessons from past Agile initiatives been learned?

- Have the overall costs and benefits, risks and opportunities been objectively considered before embarking on the approach?

Question 2

30   For complex transformations, has analysis and design been undertaken up-front or has it been omitted in the belief that an Agile approach makes it unnecessary?

- Is essential early activity such as business problem identification, full discovery phase work (rather than just user journey), feasibility, options analysis, business architecture, planning, costing and so on undertaken at the start before delivery commences?

- Have critical dependencies in complex programmes and projects that require integration with other systems, especially legacy systems, been identified?

- Is an overall design established at a level of detail to help plan and align the work of Agile teams?

- Are there clear plans for how data will be handled and integrated, especially fixed elements such as the data model and data architecture, as well as data cleansing and migration?

Question 3

31 Has management clearly set out the risks of Agile in a complex change programme and how it will manage those risks?

- Is the board aware of the potential risks based on an understanding of the technology landscape, its legacy environment in particular, the business criticality of its components and the change approaches and processes to be adopted?

- Has business accountability and ownership of the intended change and its products been made clear?

- Is the governance approach able to reconcile Agile and non-Agile components in the complex change initiative being undertaken?

- Have boards, working groups and individuals been allocated specific responsibilities for managing Agile risks and how the Agile and non-Agile components come together?

- Is the organisation proactively managing Agile risks including scrutiny of policies, technical activity, capability, testing, contingency and assurance arrangements?

Question 4

32 Is there adequate reporting of true progress?

- Is there a milestone plan against which progress can be tracked?

- Is there sufficient information being recorded?

- Is the audit and risk assurance committee comfortable that it gives a true picture of current progress?

- Is reporting conveying a view of true progress towards the overall target service model, beyond simple measures of activity (such as numbers of completed 'epics' and 'sprints')?[13]

- Are the right things being measured? (Outputs not inputs)

13 An 'epic' is a group of related business requirements which are large and complex enough to need to be delivered in smaller, incremental steps often completed within a week or two-week period, known as 'sprints'.

Question 5

33 Has the programme been reviewed, revised, descoped or reset?

- Are there mechanisms in place to assess whether the programme is on track and if not make suitable interventions?

- Did use of Agile lead people to underestimate the complexity at the start leading to an over-optimistic view of the scale of the task?

- Were the original timescales unrealistic as a result of thinking Agile could lead to more rapid delivery despite the complexity of the change?

- How is Agile being applied to business change processes?

- Has the programme 'failed' because it did not provide sufficient foundation work at the start before applying Agile? For example, did it omit to start with the data problem and how it would bring all the elements together?

- Have the lessons from such a situation been captured so the organisation can learn from them?

Question 6

34 Are commercial arrangements with suppliers set up to support Agile ways of working?

- Have suppliers been consulted early to help shape requirements at the pre-contract stages?

- Are the limitations of the traditional HM Treasury approach to business cases with artificial certainty and rigid movement from Strategic Business Case (SBC) through Outline Business Case (OBC) to Full Business Case (FBC) understood by those allocating funds to Agile development?

- Do contracts lock suppliers into fixed commitments before the requirements have emerged?

- Is there enough information about the design at a level suitable for the basis of a procurement, or are requirements vague so that suppliers have to include many assumptions in their bids?

- Are there indications that the organisation is treating such assumptions as risks to be minimised, for example as evidenced by risk logs, risk reviews and governance meeting minutes?

> **Question 6** *continued*
>
> • Is there any indication that suppliers cannot be flexible about their delivery proposals as a consequence of this risk minimisation approach?
>
> • Does this lack of flexibility result in later change requests and delays or cost increases?
>
> • Are contracts agile enough in which supplier and customer collaborate to test initial assumptions and adjust accordingly informed by actual experience?
>
> • Are risks shared between the organisation and the supplier in a collaborative way?

Other areas to explore

35 Government has stipulated Agile as a strategic directional choice for ways of working, funding and governance, and for team structures in the *Transforming for a digital future: 2022 to 2025 roadmap for digital and data*.[14]

36 The IPA guidance referred to above, while aimed primarily at review teams, is also a useful source of knowledge for audit and risk assurance committees.

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14 Cabinet Office, Transforming for a digital future: 2022-2025 roadmap for digital and data, June 2022. Available at: www.gov.uk/government/publications/roadmap-for-digital-and-data-2022-to-2025/transforming-for-a-digital-future-2022-to-2025-roadmap-for-digital-and-data (link accessed 22 September 2022).

Further resources

Below is a selection of guidance and insights that may be useful.

1   Government guidance

Strategy

Transforming for a digital future: 2022 to 2025 roadmap for digital and data – GOV.UK (www.gov.uk)

Delivery

Governance principles for agile service delivery – Service Manual – GOV.UK (www.gov.uk)

Assurance

Infrastructure and Projects Authority – Assurance for agile delivery of digital services – GOV.UK (www.gov.uk)

2   National Audit Office publications

A snapshot of the use of Agile delivery in central government, September 2012

Governance for Agile delivery, July 2012

Early review of the Common Agricultural Policy Delivery Programme, December 2015

Digital transformation in government, March 2017

Rolling out Universal Credit, June 2018

Early review of the new farming programme, June 2019

The challenges in implementing digital change, July 2021

3   National Audit Office good practice guides

Audit and Risk Assurance Committee effectiveness tool, May 2022

Appendix One

Extract from our report *The challenges in implementing digital change* (see page 17).

Figure 14

Agile project delivery

Agile can lead to poor outcomes if government applies it inappropriately

Agile is not a single prescribed methodology. Its origins are as a simple set of principles that value flexibility over rigidity when developing software. However, Agile is not 'better' – it is better adapted to some problems, but not so well adapted to others. We have seen situations which give cause for concern about its application to large-scale change and transformation programmes, or those involving complex legacy environments.

Our concerns are set out below against the topics in the National Audit Office's framework for the analysis of change and transformation.

Vision and strategy

- Organisations may be in danger of applying techniques for simple software development inappropriately to large-scale change and transformation programmes. Documentation may be sketchy or superficial and not evidence the fundamentals to a necessary level of depth.

- In the absence of clear governance and assurance processes, it is hard to get a clear view of how and what real progress is being made for the money spent, or to assess the likelihood of successful delivery. Recording methods may be inadequate to compensate for the lack of more formal documentation.

- For more complex business change enabled by technology, essential early activity (such as business problem identification, full discovery rather than just user journey, feasibility, options analysis, business architecture, planning, costing and so on) is at risk of either not being done up-front, or being done inadequately to a shallow and superficial level.

Governance, business model and architecture

- The flexibility inherent in an Agile approach is easily abused and is not an excuse for failing to undertake the necessary thinking through of what the transformed organisation will look like. The initial foundations may not be sound.

- Senior leaders may mistakenly believe that Agile means such thinking can be lightweight at the start and/or deferred to a future stage.

- Designing and developing technology solutions ahead of key business decisions may lead to nugatory or costly re-work resulting in solutions costing more, taking longer and creating a sub-optimal outcome based on an incomplete architecture and design, leading to integration issues.

Change management

- Reporting arrangements may be merely conveying project activity (such as completed sprints and epics) and not true progress on the full scope of the project.

- Organisations may confuse 'test and learn' with after-the-event rationalisation of slippages and re-work.

People, process, technology and data

- Large-scale business change requires much up-front thinking (target operating model, architecture, and so on) and careful consideration of how the legacy systems and environment will integrate into any new change.

- Such thinking needs to include clear plans for how data will be integrated, especially fixed elements such as the data model and data architecture, as well as data cleansing and migration. There is a risk that data needs are not considered sufficiently early, and where existing data sources are used, whether the current data remain fit for purpose.

- There is a risk of lack of identification of critical dependencies in complex programmes and projects that require integration with other systems, especially legacy systems.

Notes

1   This analysis is based on our internal framework designed to assess the ability of an organisation to transform digitally, either at the overall organisational level or for a major service. It provides a framework for consistent cross-government comparison and assessment against good practice.

2   An 'epic' is a group of related business requirements large and complex enough to need to be delivered in smaller, incremental steps often completed within a week or two-week period, known as 'sprints'.

Source: National Audit Office framework for the analysis of change and transformation

National Audit Office