

Can agile be scaled?



Executive summary

The Association for Project Management (APM) has sponsored this review of the practical adoption of scaled agile project management methodologies in the north-west of England.

The objective of the study was to understand the extent to which scaled agile tools, techniques and roles are practically in place in corporate portfolio, programme, project and development management methodologies, to determine the level of corporate commitment to exploiting scaled agile, e.g. pilot, full use, selective based on need, as well as drivers for selection or deselection of the framework based on the overheads.

A qualitative approach was adopted – an online survey, with first and second semi-structured interviews of project managers who use scaled agile approaches have been held to establish the level of adoption, then explore elements adopted and their relative success. Following the data analysis, a Delphi review was undertaken to reflect findings and recommendations back to the target population for validation.

The key findings are:

- Agile project management and agile development are not necessarily seen as different practices and the terms are used interchangeably.
- Adoption is limited and still largely restricted to use by IT; however, the determining factor is the existing maturity of agile adoption. Agile is still predominantly seen by the majority of study participants as a development approach, rather than a project management framework.
- An agile enterprise portfolio can provide the right environment to gain executive support, as the necessary corporate culture and support have to be explained and actively bought into by senior management. Education is vital for executive buy-in, but mass training costs could be a blocker.
- The participants' experience was that most organisations start with a pilot, then decide on whether to simply scale up a team method or go for an enterprise-driven framework when success can be proven.
- Drivers for adoption of scaled agile were determined by the participant programme managers rather than from a corporate appetite and are mainly related to speed to market. Bottom-up is the traditional way to get buy-in for an agile approach to portfolio and programme levels, but its success could not be proven by the participants in this study.
- The mindset is more important than the method, as most techniques are adaptable and transferable.
- HR support for reward mechanisms and multiskilled job profiles is needed to aid new ways of working.
- The change in reporting approach is radical – reporting under the new approach needs careful consideration, explanation and practice.

Further research is needed to understand how to scale up team-level agile project management methods.

“An agile enterprise portfolio can provide the right environment to gain executive support”

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1. Introduction

1.1 What is agile project management?

1.1.1 Agile versus waterfall life cycles – a basic overview

Agile development is an iterative, incremental method of managing the design and build activities for development projects. It requires team members from the business, with end users, suppliers and customer representatives working in a highly collaborative manner, in small stages and wherever possible deploying deliverables to achieve value. This approach has the benefit of delivering early business benefits, early validation of requirements and quick feedback, reducing risk and improving customer satisfaction. It typically adapts to ensure current customer needs are met, future needs are explored and it is delivered with minimal costs, waste and time than with more traditional project management approaches.

Agile project management may also have an iterative approach, and also focuses on continuous improvement, scope flexibility, team input and delivering essential quality products.

“Agile development is an iterative, incremental method of managing the design and build activities for development projects”

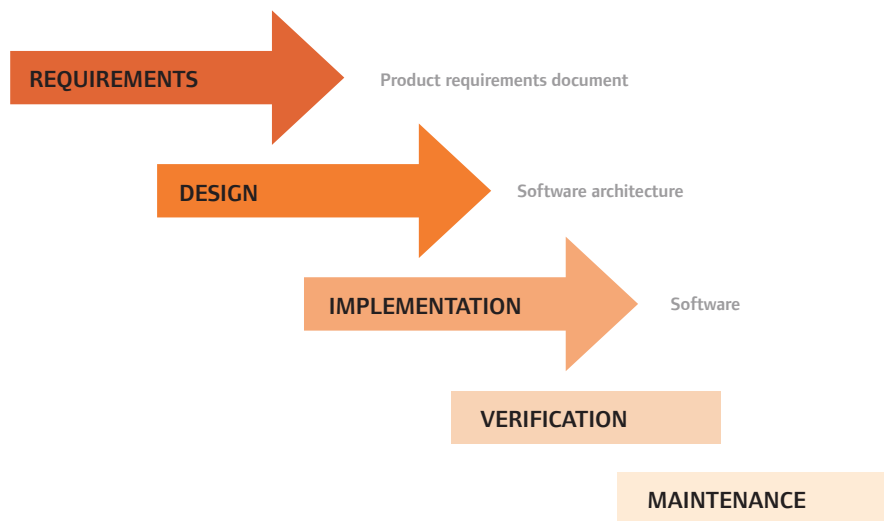


Figure 1: Waterfall diagram from Winston Royce (1970) – Managing the development of large software systems

There is a large body of literature describing various agile framework tools and techniques, and some research into its adoption. However, most usage occurs in software development and innovation. Many companies have considered its adoption in response to habitual failure of IT delivery from the imposition of more traditional project management approaches.

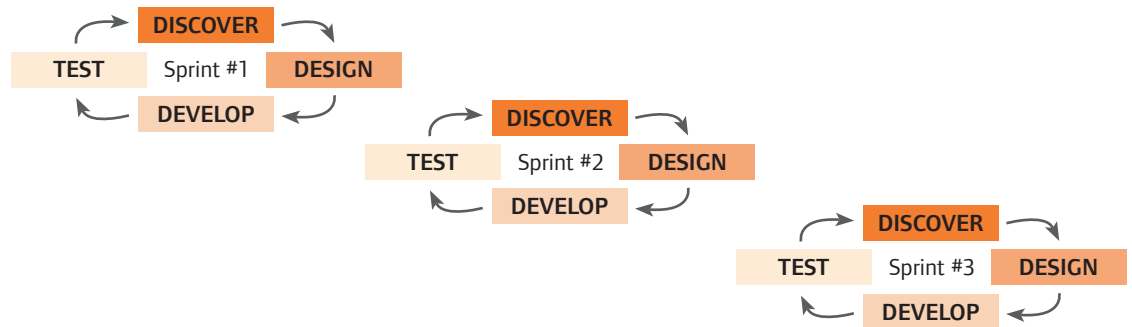


Figure 2: Agile method diagram from Michael Reich (2014), CommonPlaces, New Hampshire, United States

Agile approaches place emphasis on business ownership of products and prioritise team efforts based on business benefit. The framework aims to enhance team working and shared understanding of goals, based on a Lean concept of 'Voice of the Customer' and is akin to the Lean process-improvement approach. Agile project management, as well as agile development, should encourage people to value 'individuals and interactions over processes and tools'.

While the use of agile remains most commonly for software development, it is in increasing use far more widely, e.g. marketing, HR, product development and even engineering. However, while individuals from those sectors in the North West were approached to take part in this research study, no one from those sectors had exposure to agile projects, either for development or management, although one (from marketing) had been involved in several conferences, presentations and bids for agile approaches.

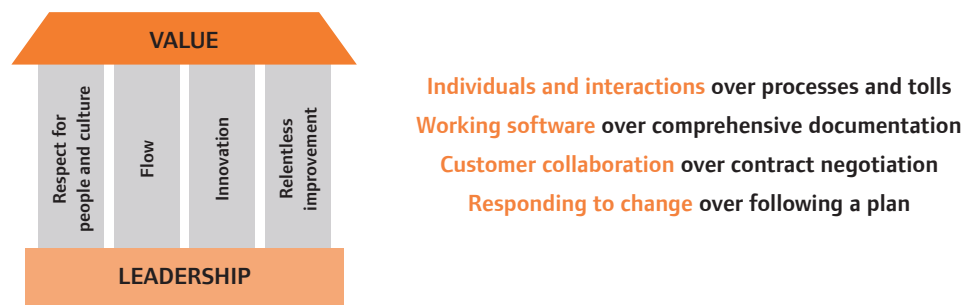


Figure 3: Aspects of a lean-agile mindset

"The APM *Body of Knowledge* defines the knowledge needed to manage any kind of project"

1.2 Why is a study needed?

Several professional bodies in the United Kingdom (Association for Project Management (APM), Project Management Institute (PMI) and International Project Management Association (IPMA)) are aiming to enhance the project management profession. Their members come from a variety of professions, including construction, engineering and information systems, which indicates willingness for the profession to learn and adopt best practice. With all of these communities there is an underpinning set of publications for their Bodies of Knowledge being similar, with some process and language differences, but all with transferable approaches and best practice.

APM is committed to developing and promoting project and programme management through its FIVE Dimensions of Professionalism, with a mission statement: 'Inspiring communities to deliver meaningful change for societal benefit by advancing the art, science, theory and practice of project management'.

The APM *Body of Knowledge* defines the knowledge needed to manage any kind of project. It underpins many project management standards and methods, including the National Occupational Standards in Project Management, while a competency framework provides a guide to project management hard and soft skills. APM qualifications and knowledge align with the IPMA. While there are numerous project and benefit management approaches, either as an industry standard or specific to organisations, all follow a similar life cycle for comparative purposes, but the level of adoption and practical usage is important for broader application of agile processes, tools, roles and techniques.

"It is the aim of this study to start to fill the gap in the current body of professional literature"

Qualifications now available on 'agile project management' include PRINCE2® for Agile and Agile PMP certification, and the APM *Body of Knowledge* focuses on traditional project management approaches; however, there is a gap for agile project management approaches. It is the aim of this study to start to fill the gap in the current body of professional literature, and start to explore its usage at a programme scale.

It is to be hoped that the findings from this study will give potential agile adopters, project sponsors and teams further information on which factors best influence successful adoption of the available scaled agile approaches and so indicate where they can best concentrate effort throughout the project life cycle.

2. Literature review

2.1 Why agile needs scaling

Most agile adoption has been driven from the software development arena, and this study aims to understand whether, with the wider adoption of agile across sectors now occurring, this remains also true for agile at scale.

Agile methodologies have been propounded increasingly for information systems and technology projects over the past 10 years. Ken Schwaber and Jeff Sutherland developed Scrum; Kent Beck introduced the concepts of extreme programming (Agile XP) in 1997.

All of these approaches advocate a key user, who is empowered to prioritise the work of a self-organising, self-managing team. The driving aim is to deliver benefits early, by doing the highest 'value' work first. Another key principle is to deliver in increments, rather than in a 'big bang' way. However, what happens when there are multiple teams, delivering many components? What are the roles needed and how can they be coordinated? How do they work within the corporate environment and culture?

"To succeed in this digital adapt-or-die environment, enterprises must be able to rapidly change the way they create and deliver value to their customers... The assumptive, one-pass, stage-gated, waterfall methods of the past have not scaled to the new challenge. A more responsive development method is needed to take on the demands of the modern technological and cultural landscape. Agile is a major step in that direction, but agile was developed for small teams, and by itself, does not scale to the needs of the larger enterprises and the systems they create." (Dean Leffingwell, creator of SAFe, Scaled Agile, Inc).

Scaled agile methodologies consider how to successfully initiate agile teams in a streamlined manner, how architecture fits into the agile life cycle, how to address documentation effectively, how to address quality issues in an enterprise environment, how agile analysis techniques are applied to address the myriad of stakeholder concerns, and many more.

Scaling factors explored in this study are: extent of strategic alignment, agile culture and maturity, number and size of teams, roles, tools, techniques and reporting.

Scaled agile approaches investigated in this study are:

- DAD
- LeSS
- SAFe
- DSDM (now the Agile Project Framework, from the Agile Business Consortium)
- Scrum of Scrums

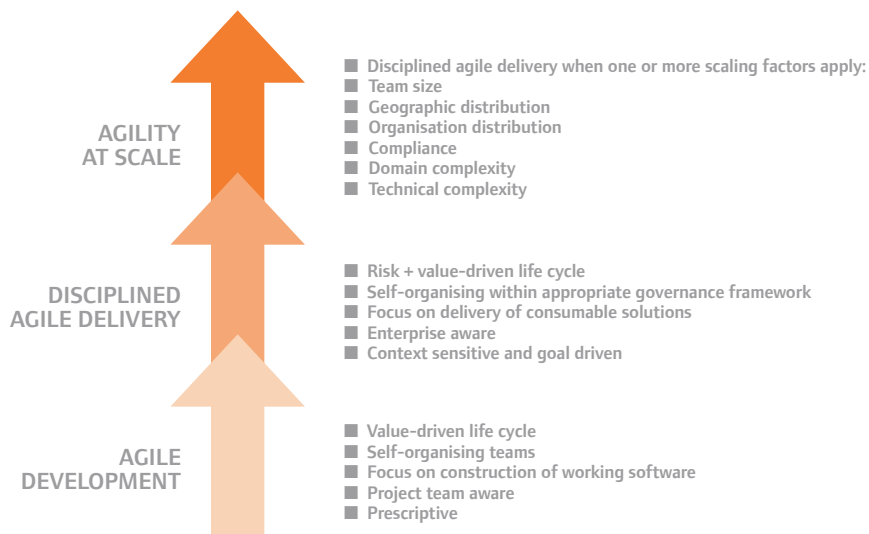
"To succeed in this digital adapt-or-die environment, enterprises must be able to rapidly change the way they create and deliver value to their customers"

“DAD takes a goals-driven approach and recognises that one process does not fit all”

2.2 DAD overview

From the DAD website: “DAD is a hybrid approach, which extends Scrum with proven strategies from agile modelling (AM), extreme programming (XP), unified process (UP), Kanban, Lean software development, outside in development (OID) and several other methods, to address the full, end-to-end delivery life cycle from project initiation all the way to delivering the solution to its end users.”

DAD takes a goals-driven approach and recognises that one process does not fit all, so includes advice about technical practices, e.g. as well as the documentation and governance strategies missing from Scrum. That ability to adapt other techniques includes adapting the team roles as scope increases.



2.3 LeSS overview

Large-scale scrum is widely adopted in the United States.

“LeSS provides a large-scale Scrum framework, with the aim of directing teams to consider the whole product, rather than components”

LeSS provides a large-scale Scrum framework, with the aim of directing teams to consider the whole product, rather than components. The framework advocates up to eight teams (of eight people each), with LeSS Huge for when a few thousand people are required on one product.

Key principles, similar to those in Scrum, are:

- **Coordination:** Just talk, communicate in code, travellers, open space and communities. LeSS has many complete, cross-functional teams (with no single-specialist teams), but one common sprint. So, all cross-functional teams share a common sprint, to deliver a common shippable product every sprint.
- **Overall product backlog refinement (PBR) meeting:** This includes the one product owner and people from all teams, to decide which teams are likely to implement which items, before holding individual team, more detailed PBRs. There is a single product backlog.
- **One definition of done for all teams.**
- **Sprint review:** For inspecting the product increment and new items, run like a 'science: a large room with multiple areas, each staffed by team members, where the items developed by teams are shown and discussed'.
- **Overall retrospective:** This is a new meeting not found in one-team Scrum, and its purpose is to explore improving the overall system, rather than focusing on one team.

The project management responsibilities are shared between product owner and teams.

"SAFe is based on Lean-agile principles, with practices grounded on nine fundamental principles"

2.4 SAFe overview

SAFe is based on Lean-agile principles (SAFe Academy website), with practices grounded on nine fundamental principles that have evolved from agile principles and methods, Lean product development and systems thinking:

1. Take an economic view
2. Apply systems thinking
3. Assume variability; preserve options
4. Build incrementally with fast, integrated learning cycles
5. Base milestones on objective evaluation of working systems
6. Visualise and limit work in progress, reduce batch sizes and manage queue lengths
7. Apply cadence, synchronise with cross-domain planning
8. Unlock the intrinsic motivation of knowledge workers
9. Decentralise decision-making

"SAFe works on four optional levels of Team, Programme, Value Stream and Portfolio"

SAFe works on four optional levels of Team, Programme, Value Stream and Portfolio, aligning strategy, product line and deliverables. Team sprints combine into programme level 'agile-release trains', managed by a hierarchy of planning and review meetings. Cadence is driven from the bottom-up and aligns to these meetings, with all deliverables aligning to an overarching 'solution intent'.

Key roles are:

- Product owner, product manager
- Scrum master, release train engineer
- Solution architect, enterprise architect
- Business owner, epic owner
- Team member, customer

This is all summarised in the SAFe 'Big Picture'.

"DSDM is an iterative and incremental approach that embraces principles of agile development"

2.5 DSDM overview

(Now the Agile Project Framework, from the Agile Business Consortium.)

Dynamic systems development method (DSDM) was first released in 1994, to provide some discipline to the rapid application development (RAD) method, adding a generic approach to project management and solution delivery in 2007. DSDM is an iterative and incremental approach that embraces principles of agile development, including continuous user/customer involvement.

DSDM was a signatory at the meeting in Utah that resulted in the Agile Manifesto and forms part of the Agile Alliance. The new manual (Agile Project Management V2) recognises the need to operate alongside other frameworks for service delivery, including ITIL, PRINCE2® (now trademarked by AXELOS Ltd), Managing Successful Programmes and PMI-BOK.

There are eight principles underpinning DSDM. These principles direct the team in the attitude they must take and the mindset to adopt in order to deliver consistently:

1. Focus on the business need
2. Deliver on time
3. Collaborate
4. Never compromise quality
5. Build incrementally from firm foundations
6. Develop iteratively
7. Communicate continuously and clearly
8. Demonstrate control

In this way, DSDM aims to address the most common failures of information systems projects, including exceeding budgets, missing deadlines, and lack of user involvement and top-management commitment.

Core DSDM practices:

- Time boxing: For each portion a number of requirements are selected
- MoSCoW prioritisation: Select requirements based on whether they 'must, should, could, won't have'
- Iterative development
- Workshop
- Modelling

DSDM roles:

The programmer and project roles are shown as representing a range of stakeholder groups:

- Business interests
- Solution development
- Management interests
- Process interests

"DSDM aims to address the most common failures of information systems projects"

These roles can either be at a project level, part of the solution development team or a supporting activity:

"Visionary has the most accurate perception of the business objectives of the system and the project"

- Business sponsor: The 'project champion'. An important role from the user organisation that has the ability and responsibility to commit appropriate funds and resources. This role has an ultimate power to make decisions.
- Business visionary: The one who has the responsibility to initialise the project by ensuring that essential requirements are found early on. Visionary has the most accurate perception of the business objectives of the system and the project. Another task is to supervise and keep the development process on the right track.
- Business adviser: Can be any user that represents an important viewpoint and brings the daily knowledge of the project.
- Business ambassador: Key representative and decision-maker for the business, embedded in the solution development team.
- Project manager: Can be anyone from user community or IT staff who manages the project in general.
- Technical co-coordinator: Responsible for designing the system architecture and control the technical quality in the project.
- Technical adviser: Supports the team with relevant specialist input and perspectives.
- Team leader: Leads the team and ensures that it works effectively as a whole.
- Solution developer: Interprets the system requirements and models it, including developing the deliverable codes and building the prototypes.
- Solution tester: Checks the correctness by performing some tests, raising defects where necessary.
- Workshop facilitator: Responsible for gathering and recording the requirements, agreements and decisions made in every workshop, for managing progress, preparation and communication.
- DSDM coach: Key to helping train members with the approach set within their corporate context.

"There is now a rapidly growing and evolving set of tools available to support continuous promotion of infrastructure and code into a production environment"

2.6 The DevOps concept

A key principle underpinning all of these approaches is that of 'continuous release', 'continuous delivery', or 'release on demand'. That is, the ability to support frequent, incremental changes as they come out of the development stage, so that they can be used immediately and so realise benefits. DevOps promotes a set of processes and methods for thinking about collaboration and working between technical departments doing development, quality and operations. Typically, this collaboration involves embedding IT operations specialists within software development teams, thus forming a cross-functional IT team (Feitelson & Beck, 2013).

The aim is to improve processes and automate as much as possible, to immediately implement pre-approved changes and make approvals happen on demand. Typically, operations functions run cyclical (weekly) change-approval sessions, which time constrains development teams in delivering business benefit.

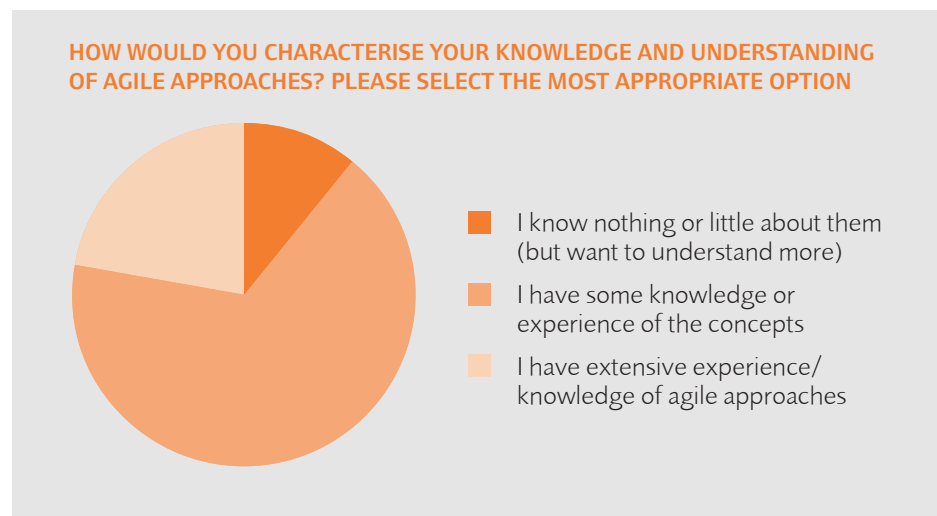
There is now a rapidly growing and evolving set of tools available to support continuous promotion of infrastructure and code into a production environment. These support agile teams by enabling business value to be achieved for each iteration, rather than their hitting a bottleneck as software comes out of the team into the formally change-controlled operational environment.

While this term obviously applies to IT processes, the underlying principle of removing downstream bottlenecks has been well understood and applied in manufacturing for decades, and can equally apply across a range of business areas.

3. Findings

3.1 Survey results

A survey was hosted on the APM website and sent to APM members via social media channels, but the number of respondents was disappointingly low, at only nine. This is obviously too small a sample to be statistically significant, but the lack of response is of interest and is possibly indicative of a lack of adoption of agile at scale, which would be consistent with APM North West event exit polls from a previous study on practical adoption of agile, published in 2016.

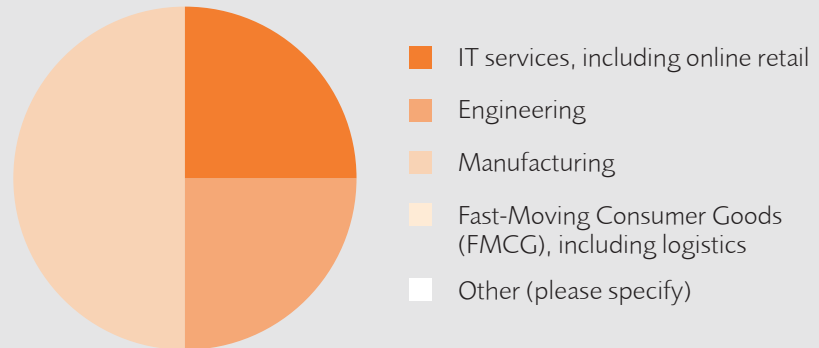


"Agile methodologies developed out of the IT sector, but really grew with the move into digital technologies"

Twenty per cent don't use agile at all, while 60 per cent use scaled agile approaches to manage programmes and 20 per cent for large, complex projects.

Agile methodologies developed out of the IT sector, but really grew with the move into digital technologies, with their need for flexibility and speed, reliance on close business engagement and development of new roles to enhance customer involvement. One respondent did confirm that agile is used for a range of things beyond software development.

WHICH OF THE BELOW INDUSTRIES DO YOU WORK IN?



Of those respondents who adopt an agile approach, a range of methodologies has been implemented: an in-house methodology, a flavour of Scrum of Scrums, as well as DSDM, DAD and SAFe.

"A feature of scaling agile methodologies should be the need to align deliveries to corporate strategy"

A feature of scaling agile methodologies should be the need to align deliveries to corporate strategy. The respondents, in the majority of cases, agreed that this happened. However, the reasons for adopting the approach at a programme level was predominantly speed to market and business involvement, rather than cost saving or cultural fit, "while a flexible approach can alleviate many of the problems associated with projects, increased costs and missed deadlines, its real value lies in the collaboration it facilitates between project manager and client" (A Coleman, 2016).

The team scale was identified as between five to 10 teams.

One respondent stated that the main dependencies between teams were resource-based or timing variations, depending on external factors, rather than on the critical path. However, the programme was structured so that each work package could deliver some degree of business benefit on its own.

"All programmes released multiple iteration of software into the live environments, but all with fewer business releases"

3.2 Interviews

3.2.1 Interview context

Several interviewees had heard senior management talk about scaled agile in a large financial services organisation, and there had in the past been a big commitment to implementing it, but the adoption was slowing and, as a result, not much adoption has been seen at a programme management level.

The typical enterprise scale and scope was one programme running iterations of three months' duration. All programmes released multiple iteration of software into the live environments, but all with fewer business releases. As an example, one programme shipped to the users only once, to minimise business change and disruption, but shipped more than 40 deployments successfully. In three cases, agile programmes were being used to transform technology.

In the majority of cases, the decision to use a scaled agile, or even agile, approach was the sole decision of the programme/project manager, rather than being mandated by a corporate direction. The driver for the decision was, in all cases, the need for speed to market.

3.2.1.1 An agile maturity model

Agile enterprise maturity is seen by all interviewees as necessary before increasing to agile at scale, so that a mindset has been established – at least with some groups – that can be used as an example to others. Maturity also implied that tools and working conditions will be available to support multiple teams working in an agile way, as co-location will always remain the mindset.

"An organisation could assess its level of agile process maturity along two dimensions: technical and managerial"

"An organisation could assess its level of agile process maturity along two dimensions: technical and managerial. Along each dimension, a three-level rating scale is proposed" (C Sims, 2009).

Along the technical levels are:

1. **Non-agile**
No particular practice is established in this level. An organisation whose software process is at this level does not follow the basic premises of the agile attitude.
2. **Minimum**
This level contains the minimum requirements in order for a process to be considered agile.
3. **Consolidated**
In this level, the organisation begins the quest for technical improvement of its process, departing from the minimum features that define an agile process towards a more disciplined, professional, efficient and productive process.

Similarly, three levels are proposed for managerial process maturity:

1. **Initial**
Characterised by the absence of particular practices.
2. **Organised**
Project management practices are established.
3. **Disciplined**
Intra-project practices support management decisions with numerical data.

All of the interviewees' experiences explored were in organisations working at agile technical maturity level 3, but process maturity level 2, with one (currently not implementing scaled agile) considering a Scrum of Scrums approach primarily as a means to bridge the agile/waterfall gap.

3.2.2 Executive buy-in

All participants stated that gaining senior buy-in is key, and that their organisations started a community of practice, which struggled to gain traction, so all started with a pilot. This mixed-stage approach also has the advantage of building confidence in governance groups who have not been exposed to agile before. Contrary to recommendations in each framework, none of the senior sponsors received formal training in either an agile or a scaled agile approach.

An experienced agile coach observes that, "There is a risk of scaled agile being tarnished by start-ups within old-style cultures, so it's important to get to the right leadership. Even if that leadership 'gets it', all programmes examined hit traditional process controls lower down the project levels." The feeling was that a programme or large project probably can't go scaled if there is any type of legacy, as it implies the management process and culture, even if not the tools, will be inflexible. Where a scaled programme was successful, it avoided more traditional business functions, for instance, marketing. Where the participants' scaled deliveries did not go so well was in those more traditional functions with inherited process and systems, or where a supplier undertook a section of work.

"There is a risk of scaled agile being tarnished by start-ups within old-style cultures, so it's important to get to the right leadership"

The importance of setting the expectation for the business effort in a scaled agile approach was emphasised, especially sustained involvement during acceptance testing. Having that agreement up front freed the team to plan ahead and use its energies to clear other roadblocks.

Education was needed to explain progress reporting, but once the use of Kanban boards and burn-up charts was understood and experienced, they were very well received. Another stakeholder management technique most project managers used was to share the Scrum or Kanban boards showing key metrics on a regular basis, and concentrate on making the tracking and communications highly transparent.

Education is vital for executive buy-in; all contributors confirmed that strong sponsorship was the most important factor for the success for scaling agile across larger teams, scope or budget, so time should be spent in gaining a clear understanding of the methodology to be used. Be aware that mass training costs could be a blocker, so consider 'train the trainer' in-house.

3.2.3 Deciding which approach to use

The overall view was that scaled agile adoption is limited because there is still a traditional portfolio approach at the top level. They still see the value of a single business case rather than as a flow of work.

Only two programmes used formal scaled agile framework; the others were 'consistent' with an approach and adopted/adapted practices. Five Scrum teams was the average for the interviewees undertaking a scaled agile programme or project.

The majority of project managers stated that the organisations they worked with had started with a pilot to decide on whether to simply scale up a team method or go for an enterprise-driven methodology. One programme manager observed that, "Bottom-up is the traditional way to get buy-in at all levels when success can be proven, e.g. Scrum of Scrums. However, more traditional corporates may be more comfortable starting with a methodology driven from the top-down, e.g. DSDM, which is also seen as being broader than just IT."

3.2.3.1 DSDM (now the Agile Project Framework, from the Agile Business Consortium)

DSDM is seen by several respondents as strong in the following areas:

- Giving a shop floor understanding
- Acknowledging the role of a business visionary
- The roles specified in the approach
- Good product ownership

“Scrum as described in the framework doesn't configure to address the inevitable scale issues at enterprise level”

Some people using DSDM stated that Scrum was 'just about' scalable and they had considered using it for the simplicity. Their view was that it is possible for an experienced practitioner, but Scrum, as described in the framework, doesn't configure to address the inevitable scale issues at enterprise level. In the view of the participants, agile works best with up to four teams.

3.2.3.2 Scrum of Scrums

Scrum alone can miss where the value is; participants frequently talked of the Lean start-up concept of minimum viable product, to understand how to meet the needs of the market at that time. This concept can result in incomplete products, e.g. carrying on with manual processes. The emphasis is on 'How to computerise' rather than a focus on the full value. The teams concentrate on shipping, not always 'Why are we shipping?'.

Scrum is seen very much as a delivery framework, not a project management framework.

"A key point to address in the programme design is that Solution Intent is critical to maintaining solution integrity"

3.2.3.3 SAFe

SAFe is widely used in the United States, but so far seems to have limited adoption in the United Kingdom, a view that was validated by the participants in this study. Where it had been used, the whole approach had been taken as standard, so all roles and terminology had been adopted, not adapted.

There was a universal feeling that release trains incur a lot of overheads and DevOps investment is needed to achieve release on demand, but that, as a technique, weighted shortest job first (a calculation to assign weighted scaling to elements of a feature) is a great way to improve understanding of priorities and is a transferable concept. A key point to address in the programme design is that Solution Intent is critical to maintaining solution integrity.

SAFe needs an understanding of Lean and Kanban to make sure the right things get delivered, but Kanban is just a way of ordering things by value at portfolio level. The SAFe big picture helps to set context. (However, it should be noted that this is only SAFe's view of Kanban.)

There is a separate approach called Kanban, which works at team and programme level, too, and one participant had experienced significant success with Kanban in a global corporation. That organisation had a level of agile and product line maturity that culturally fitted, which was seen as a key contributor to the successful scaling of multiple agile teams.

One IT project manager notes that: "The key message is if you need to scale agile, then challenge this and the reasons are more likely to be a non-agile mindset."

We should differ between scaling agile (DAD is more aligned to this, e.g. where there are many independent feature teams across the entire organisation, and delivering a large proposition using an approach such as SAFe.

"Try to focus on feature teams delivering working products frequently by having the capability to do this together with capturing feedback"

Scaling agile adds complexity as there is a requirement to sync up the different teams. There is also potentially more upfront design together with longer lead times. Longer lead times delay feedback and therefore more investment could be needed, just to find out you are doing the wrong thing. Instead, try to focus on feature teams delivering working products frequently by having the capability to do this together with capturing feedback.

The message is that it is better to have independent feature teams delivering slices of functionality, capable of delivering something that is usable.

Scaling agile is often done for the wrong reasons. For example, a senior manager had made a large promise or the business is not prepared to prioritise in order to deliver incrementally, situations that all the project managers interviewed had experienced.

3.2.4 Use of tools and techniques

A general point that was repeated is the importance of using tools to support process, but as standard rather than customising them.

3.2.4.1 General points

All participants agreed the following:

- It is vital to plan the environment. Full team-planning sessions need a lot of space! Remote teams or team members need good online and communication collaboration tools.
- There is a set-up effort and potential cost, to ensure everyone has access to the facilities required for successful team-working across time zones and geographies.
- This even applies for co-located teams, but is not as critical, as they can use more immediately visual methods, such as Kanban boards.

3.2.4.2 Tools

"Automated tooling and Kanban boards can be used to simplify tracking and reporting"

Among the interviewees, their experience was that the most popular tool for team collaboration and coordination is Jira, with DevOps supported by Rally and CA Agile Central. Automation testing has improved over the years, but no consistent toolset emerged during this research exercise.

Reporting needs careful consideration, explanation and practice. Automated tooling and Kanban boards can be used to simplify tracking and reporting, but consumer expectations need to be set to be in line with the tool capabilities, rather than adding a measuring 'overhead'.

3.2.4.3 Techniques

Foundation sprints were used to establish the working environment, tools configurations and automation. So that process between teams was not a bottleneck, a 'sprint 0' was used to establish principles, such as a finish-to-finish dependency on cross-team document approvals.

One programme manager suggested considering the level of risk, and building risk stories or capacity to account for delays met when relying on external teams.

"Retrospectives are vital, as they provide the regular inspection point with the business"

Agree the definition of done and, if necessary, have multiple levels of definitions. One programme had three: ready for system test, ready for live and go live, but the portfolio was only finished when all projects had finished to the last level.

Retrospectives are vital, as they provide the regular inspection point with the business. Regardless of framework, be aware that they take a lot of preparation beforehand, particularly to ensure full business attendance. It is also the point to tie in with waterfall milestones when using a mixed model.

"The main principle of all agile project management (and development) frameworks is to deliver early benefits to users/customers"

3.2.5 Strategic alignment

Outside of the major digital companies of Google and Spotify, there isn't much anecdotally about agile at scale in the United Kingdom. Some major public-sector organisations are adopting agile for certain products or business units, but this has not yet resulted in widespread agile roll-out.

There is a perceived misalignment between programme and organisational goals. This lack of publicity around the methodologies is validated by the participants, some of whom commented that they don't see lots of value mapping going on in corporations. The key role of product ownership may belong in sales, as seen at BA, as sales are usually the people who realise what the customer actually wants, but there needs to be coordination with the direction the board wants to go in the future.

Regardless of product line, a Kanban style of understanding is vital, with enterprise at the top, strategic themes dropping into portfolio management and value-driven backlogs.

The main principle of all agile project management (and development) frameworks is to deliver early benefits to users/customers. Benefits management (where value is realised early and the product delivers the anticipated benefits) needs to be done at several levels when adopting scaled agile, to tie back to the enterprise. So, getting the necessary product-management hierarchy to deliver at scale is difficult; how to find the right personal attributes, e.g. stakeholder management, interpersonal and communication skills, and product knowledge/control. A product manager is not the same as a service manager; a range of alternative skill sets may be asked to fulfil the role and getting an efficient mix of people at all levels in a scaled project or programme was a challenge that all the interviewees had faced, with varying degrees of success. Not one project manager had managed to get the perfect situation, and aligning the vision and prioritisation across levels took time and energy!

All agreed that a difficult, but fundamental task is to define even just one good product owner, who can take an enterprise view, to see how product, work and knowledge flow across areas for the strategic direction, as product alignment is the fundamental cultural shift needed.

3.2.6 People management

All participants saw this as key, with people and value being at the heart of scaled agile.

"It's important to think more about the work and the people interactions, and the team's familiarity together, than simply pull together individual job specifications"

Agile – and digital in particular – is seen as driving new roles, which increasingly need flexible role descriptions and a commensurate reward structure. It was seen that teams benefit from a good split between in and outsourcing, with new skills brought in from third parties. This did mean extending the communications required to achieve continued senior engagement across all parties. It should be noted that there were some attempts to run outcome-based, fixed-price contracts, but the majority of teams took contractors on, for a time and materials basis, during agile iterations.

There are two levels of teams – moving from single skills, e.g. development, quality assurance, to a grouping of individuals. The next step is to have some specialists and then add people who can cover a range of skills, with an interim step where people understand enough to help. Programme resource-management functions need to understand that workload for skills fluctuates, even within iterations, so a project or programme manager can't just say how many business analysts, how many project managers, etc, will be needed. It's important to think more about the work and the people interactions, and the team's familiarity together, than simply pull together individual job specifications.

Co-location of a full team remained the ideal for all participants, who see travel as a blocker: 80 per cent of teams were fully co-located. Sprint planning is possible to do using collaboration tools for remote workers. However, all interviewees would prefer teams to be co-located, but where that is not possible, they recommend investing in regular full-team workshops, face to face, and budgeting for the necessary travel to make that happen. This is seen as vital for inexperienced agile teams, working at scale for the first time. All supported their scaled agile teams with coaches.

"The 'architecture' roles needed specific coaching on discovery, cross-team coordination and downtime coordination"

Everyone stated that all team members should be trained in the approach, cadence, tools and practice as part of the first kick-off and planning session, regardless of approach adopted. In particular, reflecting the importance of an overall design or solution intent, the 'architecture' roles needed specific coaching on discovery, cross-team coordination and downtime coordination.

Agile project deliveries need team members who are multiskilled, with appropriate reward and recognition structures.

"An organisation needs to do for training what DevOps does for environments"

3.2.6.1 Motivators

Maslow's hierarchy of needs states that people need to feel valued and secure, meaning that people need to feel safe, which is only then followed by self-actualisation (that is, development, learning and positive interactions).

Herzberg's model states that pay is a secondary motivator, but cut it and it drops back to threatening people's security, which shifts the emphasis back to achievement at the expense of self-actualisation. Pay traditionally made up for markings on performance, but resulted in setting individuals against each other, rather than actively supporting team deliveries. So, both these models need to be considered when building agile project teams.

Learning new skills takes time and gets fewer rewards, as an individual is marked as less confident and competent, so it disincentives multiskilling and tasking, which is vital for an agile approach. Agile at any level, but particularly when scaled across large numbers of people, needs to be backed up by standard Job Descriptions being along a single skill line.

Agile always bumps up against slower, external elements (hence the rise of the DevOps concept). So, to adopt scaled agile, teams need multiskilled people who can move around. The real requirement is for skills training on demand, to the desktop, rather than the more traditional way of booking a course, waiting for spaces and attending off-site sessions. So, teams need support with HR overall, not just pay and incentives structures. An organisation needs to do for training what DevOps does for environments!

HR support was seen by several participants as vital. An experienced agile programme manager states that, "for new reward mechanisms, multiskilled job profiles are needed to aid new ways of working. The teams may not know what skills are needed at the outset and should be encouraged to learn and develop. This needs to be supported and wherever possible rewarded, but may not fit into a traditional hierarchy or role structure."

3.3 A case study

One SAFe project was seen as a huge success, despite a slow and difficult start, because it overachieved in very aggressive time frames.

The business case was produced in a waterfall approach with the budget split along business functional work streams. As a result of this financial structure, the interconnectivity proved difficult to manage across teams, partly because of a multiplicity of solution providers, so several sprints in, the project deliverables were further decomposed into process and functionality, but with shared solution intent and prerequisites.

"A lesson learnt was to take standard tools and adapt the process, rather than waste a lot of time adapting the tool to the process"

The roadmap was fixed, but should have been more flexibly based on deliverables: working at too high a level meant components weren't identified soon enough. So, prioritisation was geographically based, with the backlog being more a consultation than refinement process, which did not work particularly well. Resources, therefore, had to be planned purely on availability points. As a result, initially, the only real reporting was out of testing, who were using Jira. What eventually worked well was a hierarchy of sprint board for sprint status, feeding into an Implementation board showing for each geography, that would add on testing information, then rolled up to a Kanban radiator for the overall project, showing all stories.

Suppliers were managed onshore, as individual team members (on a time and materials basis), in daily face-to-face sessions. It was explained that the workload was not going to be dictated – it was empowered and made accountable; while incremental improvements were delivered, the supplier management remained a struggle.

Stakeholder involvement proved hard to maintain, with attendance at weekly meetings dropping and needing constant checking.

Setting up a systems team that handled configuration activities removed a legacy process bottleneck. Releases were focused on geographical regions to minimise business disruption, enabling activities to be taking place in up to 20 countries simultaneously. As a result, estimation became highly accurate and tasks fully repeatable. A lesson learnt was to take standard tools and adapt the process, rather than waste a lot of time adapting the tool to the process.

An important success factor was the positive personal behaviours and a no-blame culture, ensuring an emphasis on learning from mistakes and consequent continuous improvements. All team members were formally trained at the start, using central funding to ensure consistency of language, understanding and method across all participants. A corporate specific layer was then added as an optional extra.

"It proved difficult to have a complete interview about agile project management without falling into the discussions around agile development"

4. Conclusions

The aim of the study was to:

- Assess the state of the uptake of scaled agile project management in the North West.
- To understand the methods, tools and techniques from project professionals to add to the understanding of good practice.

However, it proved difficult to have a complete interview about agile project management without falling into the discussions around agile development. Consequently, some of the findings relate more to scaled agile development methods in a project/programme context. Therefore, further research questions are indicated into why the adoption of agile project management is still confused with agile development approaches.

The participants represented a broad range of project management experience, styles and project scales, but the drivers for selecting a scaled agile framework were predominantly about speed to market.

The projects delivered by the participants were, in the main, IT solutions; this could be due to some membership or network bias, but the general view was more indicative of a lack of adoption for wider project deliveries. Adoption is seen as limited and still largely restricted to use by IT; however, the determining factor seems to be the existing maturity of agile adoption. Again, further research is indicated to understand why this is the case.

A blend of DSDM, some SAFe and some Scrum were used. The consensus view is that DSDM is great at lightweight business cases that can evolve, SAFe is better on the coordination, and Scrum of scrums is a natural interim stage. However, the view was that the mindset is more important than the method, as most techniques are adaptable and transferable. So, focus on working out what is fit for your purpose and rely on the experience of the project team to decide on the appropriate blend.

All participants emphasised the need to treat any scaled agile methodology as a framework, so layer on standard tools, then overlay your own corporate language. Remember that methods are just a means to an end.

The key findings are:

- Adoption is limited and still largely restricted to use by IT; however, the determining factor is the existing maturity of agile adoption. Agile is still predominantly seen, by the majority of study participants, as a development approach, rather than a project management framework.
- The necessary corporate culture and support has to be explained and actively bought into with executive and senior management support. Education is vital for executive buy-in, but mass training costs could be a blocker.
- Most organisations start with a pilot, then decide on whether to simply scale up a team method, or go for an enterprise-driven framework when success can be proven.
- Drivers for adoption of scaled agile are determined by the programme managers rather than from a corporate appetite, and are mainly related to speed to market. Bottom-up is the traditional way to get buy-in at all levels.
- The mindset is more important than the method, as most techniques are adaptable and transferable.
- HR support for reward mechanisms and multiskilled job profiles is needed to aid new ways of working.
- The change in reporting approach is radical – reporting under the new approach needs careful consideration, explanation and practice.

“The overall view was that the number of organisations who can use scaled agile is necessarily limited, as it incurs significant overheads”

Participants had positive experiences and would use scaled agile again, but all agreed it needs *more* rigour than waterfall and an investment of both time and money to work; you can't just 'get going', as requirements have to be clear, as does an overall design.

The overall view was that the number of organisations who can use scaled agile is necessarily limited, as it incurs significant overheads; don't do it and incur the release and cadence overheads, if all you need is Lean or agile. Do concentrate on building a flexible enterprise culture and positive individual behaviours.

So, be aware that for agile to work at an enterprise level, lots of rules need to get rewritten!

Appendix A: Study approach

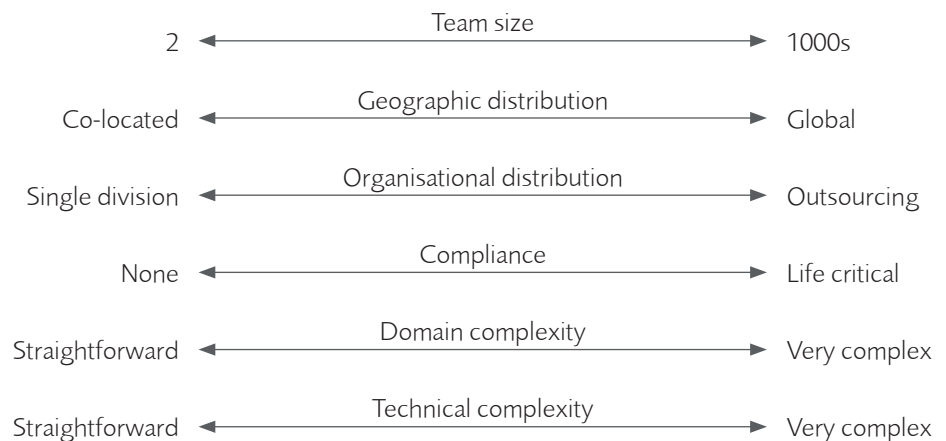
A.1 Research scope

The geographic scope of the research, for expediency of access and availability, has been limited to the North West; it is posited that the corporate and professional project management population here is representative of the wider United Kingdom environment and that lessons learnt can be transferable across the project management profession as a whole.

Companies providing training or agility coaching were excluded, as they were deemed to have a clear bias in favour of scaled agile methodologies.

Of the 30 individual, potential participants approached, 10 deselected themselves on the basis that they had no agile exposure whatsoever.

Factors for scaling agile approaches considered here are:



A.2 Research methodology

Ashurst et al (2008) undertook exploratory research using a case study approach to address the need to cover a range of organisational parameters, while Waardenburg (2013) established a grounded theory approach to agile practices in traditional enterprises, aiming to develop a theory from data rather than gathering data in order to test a hypothesis.

The aim is to uncover the issues study participants have experienced, and resist having preconceived ideas, and so limit the questions asked during the interview process. This method allows the problems to emerge naturally.

Previous studies into these factors have followed a qualitative approach, utilising a range of surveys, questionnaires and interviews. Wateridge (1998) delivered a questionnaire on success criteria with subsequent interviews, asking respondents to indicate and rate the five most important criteria for success. This was followed by further interviews of key project staff, gathering individual perceptions of those success criteria. Agarwal (2006) investigated quantitative success criteria through questionnaires targeted at project managers, and business account (relationship) managers representing the senior end customer.

“Companies providing training or agility coaching were excluded, as they were deemed to have a clear bias in favour of scaled agile methodologies”

“The aim is to uncover the issues study participants have experienced, and resist having preconceived ideas, and so limit the questions asked during the interview process”

“The study therefore followed the same ‘interpretive’ style, to gain knowledge of the practical extent of agile adoption at scale, supported by real-world evidence”

Shao et al (2009) reviewed programme success and found that much is still conceptual, with little in the way of literature suggesting measurements. This includes PMI and Office of Government Commerce guidance, which relates purely to benefits realisation, value creation or organisational change. In the qualitative study of 2011 for programme context and success, semi-structured interviews were used to collect data, with interviewees being the people with the best knowledge of the research subject. Sample numbers were identified on a theoretical saturation point and stopped when no new concepts or categories emerged from interviews.

This approach was used by the author on a previous, similar study into practical adoption of agile, published by APM in 2015 (bit.ly/PracticalAdoptionofAgileMethodologies). The study therefore followed the same ‘interpretive’ style, to gain knowledge of the practical extent of agile adoption at scale, supported by real-world evidence.

A.3 Data collection

The data-collection process used for this study was semi-structured and qualitative, and structured in three stages: an online survey, interviews and a Delphi review.

Evidence was gathered through a series of semi-structured interviews, covering the following areas:

- Corporate context
- Roles and responsibilities
- Tools and techniques
- Organisational enablers and culture
- Training and team skills

Practically, a concentration diagram was used as the basis for interviews to cater for speed of responses with a checklist to review to give consistency of approach.

Data was captured on interview sheets and validated through a Delphi review (detailed in the following section on data analysis).

A.3.1 Challenges to data collection

“The main barrier was the need for final approval from corporate communications teams”

A key challenge to overcome was of metrics disclosure: full-project life-cycle costs, and proposed and achieved benefits. As previously stated, the main barrier was the need for final approval from corporate communications teams; the decision was therefore taken by every participant to provide all findings, anonymously.

A.3.2 Interview outline

An initial telephone interview was planned to establish the following with potential participants:

- Have you heard of scaling agile as a project/programme manager?
- Do you/your organisation use it? If yes, will you be using it again?
- Have you been trained to use it?

There then followed a series of open questions to understand the corporate personal and project context, and drive a free-flowing discussion for rich data.

Context:

- Contact's role in scaled agile – champion, practitioner, observer, recipient
- Scale of project – <100,0000, 100-900,000, >£1m, >£5m
- Type of project – regulatory, innovation, service improvement

Discussion generation:

- How do you decide on which framework to use?
- How many teams do you have working in an agile way? (To understand the scale challenges.)
- Has it been used at scale more than once?

A.4 Data analysis

A.4.1 Data mapping

Organisation	Process	Project team	Project type and others
Organisational culture	Process automation	Team autonomy to make decisions	Urgency to complete/pace
Strong executive support		Team leadership	Goal clarity
Agile-style work environment	Formalisation	Team knowledge about agile	Project complexity
Maturity of agile framework	Frequent development milestones	Team experience/expertise	Support systems, e.g. test harnesses, design tools
Adequate reward for agile use	Process concurrency	Project manager experience	Customer involvement
Multidisciplinary teams	Resource competition	Multidisciplinary teams	

A.4.2 Delphi review of findings

The Delphi method is a structured communication technique, originally developed as a systematic, interactive method, which relies on a panel of experts. Delphi is based on the principle that forecasts (or decisions) from a structured group of individuals are more accurate than those from unstructured groups.

"The Delphi method is a structured communication technique, originally developed as a systematic, interactive method"

The Delphi technique's unique contribution is the 'boiling down' of differing expert opinions or other stakeholders into consensus for decision-making, without creating direct confrontation or allowing strong individuals to dominate the process.

The participants answer questions (via interviews), then responses are collected and analysed by the facilitator, and common and conflicting viewpoints are identified. If consensus is not reached, the process continues, to gradually work towards synthesis, and building consensus.

The facilitator (the author) then provides an anonymous summary of the experts' comments, in this instance via email. The experts are encouraged to revise their earlier answers in light of the replies of other members of their panel. It is believed that during this process, the range of the answers will decrease and the group will converge towards the 'correct' answer and the mean average score of the final rounds determine the results.

For this study, the experts consisted of the interviewees and representatives of scaled agile consultancy and training organisations.

A.5 Participants

To avoid concern about gaining approval to publish, even anonymously, potentially sensitive information about project performance, individual project managers, rather than corporates, were approached for interviews. Of the 20 approached, 12 agreed to participate in interviews. All had recognised agile project management or management qualifications. A third had some form of scaled agile qualification, in addition. All had more than 10 years' project management experience.

"All participants had considered using agile in a variety of organisations, across a range of projects"

All participants had considered using agile in a variety of organisations, across a range of projects, but predominantly in regulated environments, such as national institutions, financial services or pharmaceuticals. Only one project manager had used agile for non-IT delivery. All had undertaken some form of formal training or accreditation in at least one scaled agile management approach.

The majority of projects cited as examples were circa £20m, with a few exceptions around £100m, which appeared to indicate a similar scale of team size and duration. All were fewer than 12 teams, with the smallest scaled implementation consisting of four delivery teams and the largest of 350 people.

Glossary

Benefits realisation	The process of understanding, planning, realising and reporting both financial and non-financial benefits associated with technology-enabled business change.
Business relationship management	A formal approach to understanding, defining and supporting a broad range of inter-business activities and relationships over time.
DAD	Disciplined agile delivery.
DevOps	Development/operations bridges the gap between agile teams and operational delivery to production.
DSDM	Dynamic systems delivery methodology, now changed to the 'DSDM project management framework'.
Information systems (IS)	An integrated set of components for collecting, storing and processing data.
IT	The software and hardware systems that support data-intensive applications to deliver information, knowledge and digital products.
Kanban	A method for managing work with an emphasis on just-in-time delivery, while not overloading the team members. In this approach, the process, from definition of a task to its delivery to the customer, is displayed for participants to see, and team members 'pull' work from a queue.
LeSS	Large-scale scrum.
PRINCE and PRINCE2®	A process-based method for effective project management.
Project management	The discipline of planning, organising, motivating and controlling resources to achieve specific objectives.
RAD	Rapid application development.
SAFe	Scaled agile for enterprise.
Scrum	An iterative and incremental agile framework for developing and sustaining complex products.
Waterfall	A sequential design and delivery process.
Wiki	A website where content is modified by end users.
XP	Extreme programming.

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