



In association with



How Agile and DevOps enable digital readiness and transformation



Freeform Dynamics, February 2018

Introduction

In today's world, software is everywhere – and it is spreading fast. Once it was just big enterprise applications, which changed slowly. Then it was web applications and mobile apps that varied week by week or even every hour. Today though, fast-changing software is part of everything that the business is, and everything that it does, from the systems it uses internally to its brand via the apps and services it provides to its customers.

Software powers it all – from the embedded systems that run the buildings, through the manufacturing plant that creates the products you sell, to the machine learning (ML) and AI systems that analyze what the organization does and recommend changes or new products and services to add to the mix.

A major consequence of the digital initiatives that are transforming enterprises is that lines are blurring in terms of where IT ends and the business begins, and vice versa. Tech-centric activity and traditional product management are more and more intermixed. The overriding impact is that it's increasingly difficult to unravel the dependencies.

The pressure is on to make every organization as flexible as possible in response to changing customer demands, user expectations, regulatory change and, most importantly of all, market opportunities. For many, this means implementing agile/DevOps style delivery across the entire organization, not just within IT. This provides the organization with the flexibility it needs to compete effectively and deliver what its customers want and expect. It must be business-driven, integrated across teams, iterative and use the right analytics and feedback loops enabling fail-fast and continuous improvement – everywhere.

That said, it's not ideal if IT is very responsive to business if the business isn't able to respond to IT, and more importantly, to the opportunities and insights that IT can deliver in terms of customer and product feedback, and market opportunities.

The Agility Masters and the modernization of software development

The challenge for software development and IT operations teams is to be as agile and responsive as possible, extracting and utilizing insights and feedback to push things forwards rapidly, but securely. This is not an overnight change, but in a global survey of IT and business executives on how organizations are modernizing their software delivery practices, we found a group which has mastered the key principles. This group is already doing most or nearly all of the right things to make agile and DevOps an integral and essential part of how they function day by day.

These 'Agility Masters' are also more likely than their mainstream peers to work in organizations that are themselves more agile across the business than their peers. The results are clear, and it is unlikely to be coincidental that these agile organizations are seeing 60 percent higher revenue and profit growth than the mainstream.

In the remainder of this paper we provide a strong, evidence-based case for taking an agile and DevOps approach to software creation and delivery and to the daily operations of IT.

This paper is part of a series that explores the concept of the 'Modern Software Factory', a term coined by CA Technologies, the sponsor of the research. The series provides a blueprint for building agility, automation, insights and security into the entirety of the software lifecycle. The topic of the Modern Software Factory is explored in a paper titled "[Don't Let an Outdated Software Strategy Hold You Back](#)".

Part II of the series explores the topic of DevSecOps in a paper titled "[Integrating Security Into the DNA of Your Software Lifecycle](#)".

Effective software development is key to business success

The demand for innovative applications is growing relentlessly

The global business environment is pushing enterprises large and small to expand the development and use of software and applications in many parts of their daily operations.

The importance of software is growing across all areas of business, but it shows up very clearly in efforts to improve the top line. Most dramatically, it drives growth, helps the business move into new areas and allows it to compete effectively.

All these business opportunities and pressures have one thing in common, which is that they need software to be developed and deployed at a faster and faster pace.

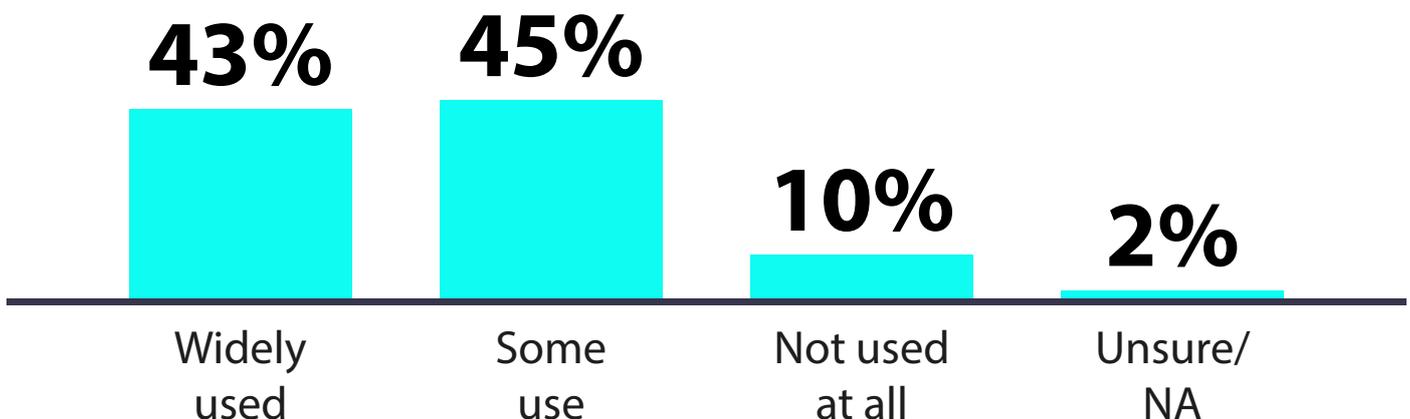
The days of projects taking years to get software into the field are coming to an end. Today speed is king, and this in turn promotes the wider adoption and expanding use of agile methodologies in software development.

To look at how agile and DevOps are being used today, Freeform Dynamics undertook a global study sponsored by CA Technologies. It surveyed 1279 senior staff – both managers and practitioners – in a range of medium-sized to large organizations across 15 countries, eight industry sectors and five continents. Their insights and opinions show clearly the challenges and opportunities facing large enterprises, as they adopt agile and DevOps more broadly.

The original principles behind agile are now more relevant than ever

The research demonstrates that while agile methodologies are in use in the vast majority of large organizations, there is still plenty of scope for improvement. In particular we must recognize that while many of those surveyed said that “agile” is widely used in their software development teams, “widely” is a subjective term that can be interpreted very differently by different people.

How much is the concept of “agile” exploited within the development team?



Still, agile is undoubtedly being used to a greater or lesser degree in most enterprises, and we will drill into this in detail later in the report. In addition, we will show how the research highlights key differences between those who have succeeded in broadly adopting agile practices and those who have yet to do so.

What is very clear from the analysis of the survey data, though, is that the original principles behind agile practices - promoting organizational models based on people and collaboration, and building the types of organizational communities in which people want to work – are well correlated with business success.

How important is software development for your organization to succeed in the following areas?



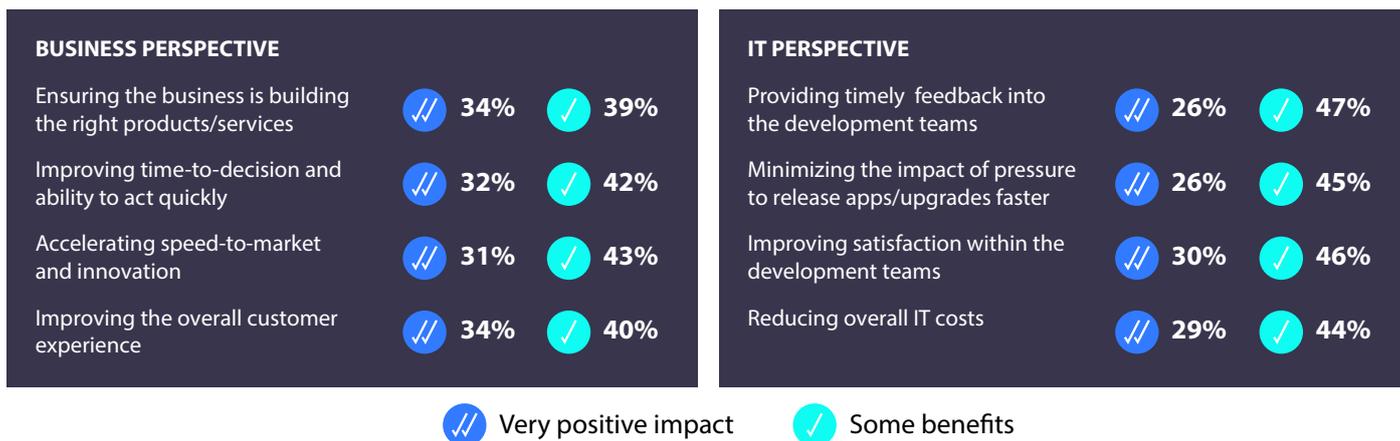
Say software is essential or important

Software delivery imperatives

Experience has led to the value of agile becoming more widely appreciated

To understand the adoption of agile, the survey asked what impact it was having on software development, from both business and IT points of view. It is interesting to see that while agile development has certainly helped with the core goals of improving speed-to-market and innovation, it is just as helpful when it comes to ensuring that you are building the right services and applications in the first place. And perhaps more importantly, the adoption of agile is also helping improve customers' experience with the apps they use – a critical factor because this can greatly influence brand awareness and credibility.

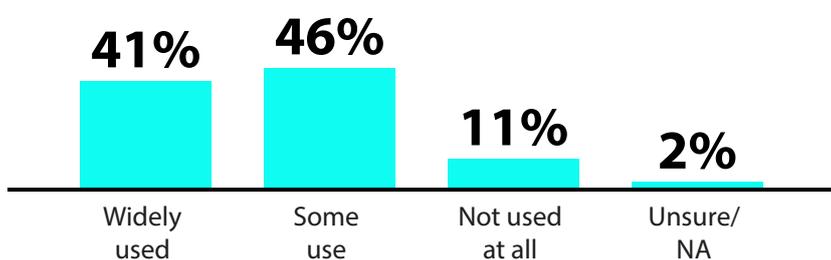
What effect, if any, is agile software development having (or do you think it will have) on the following?



But agility needs to extend beyond the development realm

True IT agility must spread beyond software development, however, because building apps is just part of the challenge. Another major component is getting the app into the hands of the user, and that often means getting the IT operations team involved. For some applications, the operations team will need to be involved for a long time, as the app grows and changes. To ensure overall speediness, IT Ops also needs to be agile.

How much is the concept of “agile” exploited within the IT operations team?



It is important to recognize that over the course of the last decade IT operations have been busy rebuilding systems to bring much greater flexibility than was expected in the past.

For example, the initial uptake of virtualization solutions was spurred by infrastructure consolidation and cost savings. However, it also enabled significant secondary gains, in particular it permits rapid change to the way IT resources are deployed.

The widespread use of such technologies, coupled with advances in modern administration tools and the maturing of cloud architectures, stacks and services, has catalyzed and enabled IT operations to become more dynamic and responsive. Operations can now respond rapidly to changing apps and services requirements, and to the evolving service quality demands of customers and users. But the survey shows there is still room for improvement.

The Master Perspective “Genuine agility requires business leaders to learn to accept the advantages of an incremental approach to the delivery lifecycle. This is important if the company is going to have the freedom to change and adapt based on market dynamics and customer feedback, but it does require a mindset shift.”
Chief Architect/CTO, Retail

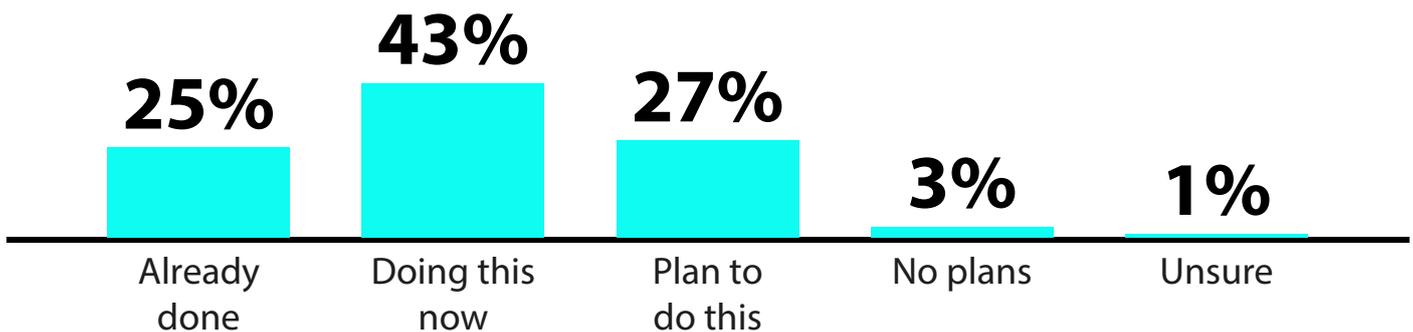
From agile development and agile operations to DevOps

Bridging the Dev / Ops gap to drive end-to-end agility

The link between improved agility in software development and improved agility in IT operations is clear. Indeed, the survey highlights that the implementation of DevOps as the next step in the agility journey is already well underway in many organizations. Ultimately the widespread adoption of DevOps has great potential to get organizations closer to the kind of end-to-end flexibility and responsiveness required to enable business-level agility and digital readiness.

But for many, the journey has only started fairly recently, and getting effective operational processes in place will require considerable attention, especially as much of the focus up until now has been firmly in the Dev side of the house.

Do you have an initiative to implement DevOps?



DevOps is key to meeting the demands of all modern applications

The fact that the DevOps journey is still in its infancy is well reflected in the survey results.

It is clear that DevOps started out in most organizations as a better way to deliver the fastest-moving subset of applications, namely those associated with customer facing web-applications and mobile apps.

However, things are moving on quickly. DevOps' relevance to a broader range of software is now well appreciated, and this in turn highlights the need for IT teams to take a scalable, integrated and robust approach.

Unless 'hardened', practical processes are implemented to smooth the broader adoption of DevOps principles, its wider use could be inhibited.

How much of a priority is it to apply a DevOps approach to the following?



The Master Perspective "Infrastructure needs 24/7 support and is different from development, so it is unlikely to see developers also responsible for its upkeep and availability." *VP Cloud, Telco*

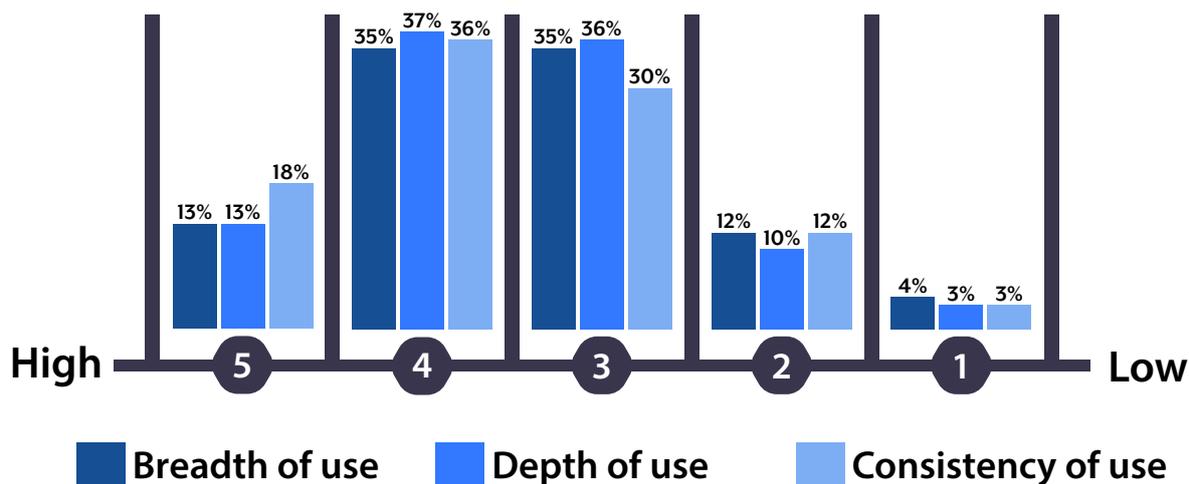
But many are still on their journey with agile and DevOps

Breadth of use is still limited

The ability of IT to respond rapidly – but effectively – to customer and business requirements depends on having agility baked into the entire software design, develop, deploy, refine and retire lifecycle. But the research indicates, very clearly, that the adoption of agile and DevOps is very mixed.

How would you rate your use of [modern methods] in relation to the following?

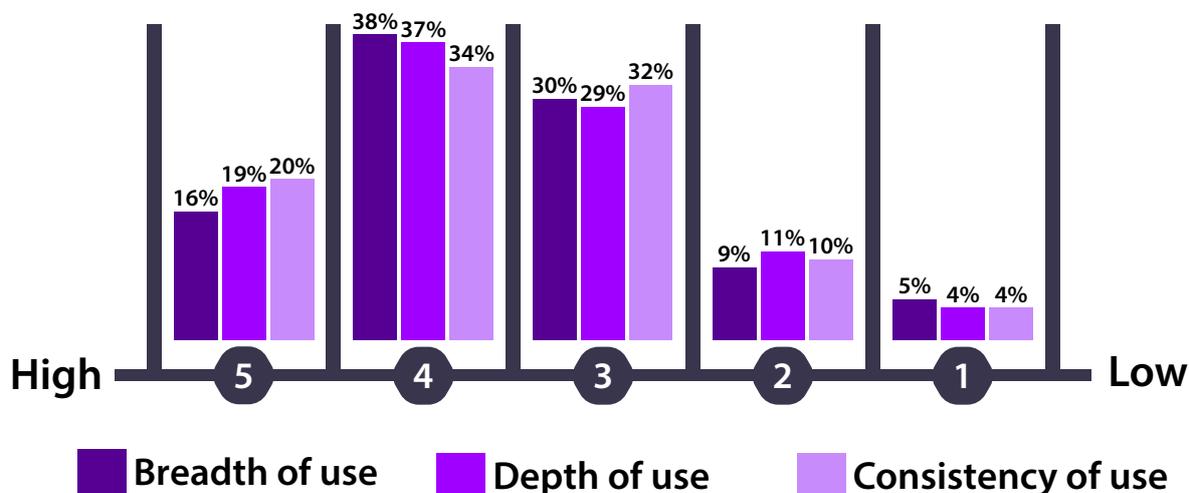
Agile



The responses specific to the use of agile methods, in particular those following the core principles of agile practices, show clear variation in adoption. While a majority rate their consistency, depth and breadth of usage to be at least moderate, only a relatively small proportion consider their usage to be high. This indicates that there is still a lot of room for improvement, but this naturally requires resources, especially training, to be made available.

How would you rate your use of [modern methods] in relation to the following?

DevOps



The same can be seen in DevOps usage, which is not surprising given that DevOps is all about IT operations staff and developers working closely together throughout the entire lifecycle of software. This must be a two-way process, for example, to ensure that software is built with an understanding of real-world operations in mind, and that developers can exploit feedback from Ops to speed bug fixes and improve service quality to customers. As in agile, the survey results show there is clear scope for improvement.

From basic to integrated and hardened DevOps

Agile and DevOps go hand-in-hand



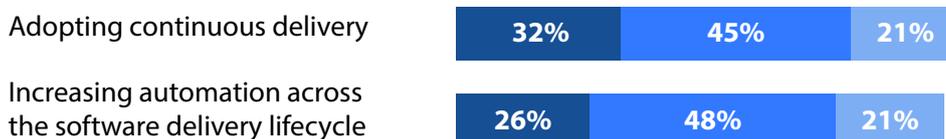
Agile and DevOps are more effective when implemented together than each on its own
(Agree/Strongly agree)

The results show that three-quarters of survey respondents recognize that agile and DevOps are far more effective when combined. The reasons are simple to comprehend, especially when you consider that it allows feedback to stretch all the way from live customer experiences through to requirements engineering. The feedback loop can also show how well software delivery is performing and supporting the business itself. But to reap these benefits

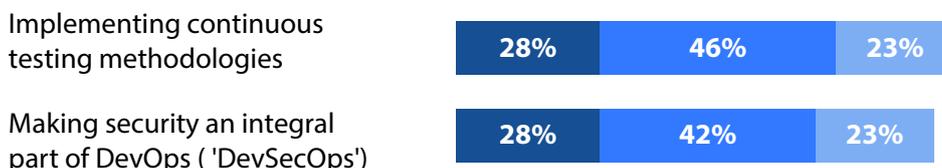
you must leverage the responsiveness and flexibility offered by cloud, containers and other new code design and delivery architectures, with a smooth shift-left of all activities and finer granularity of iteration across the whole of the software delivery and ops cycle.

Which of the following measures/initiatives is your organization taking to address current software development and delivery challenges?

PRACTICAL LIFECYCLE-AGILITY ENABLERS



MANAGING QUALITY AND RISK



INSIGHTS AND VISIBILITY



■ Already done **■ Doing this now** **■ Plan to do this**

The ideas behind continuous delivery (CD) provide a practical framework for experimenting, iterating and enabling a fail-fast approach. This goes hand in hand with automation, which in turn allows a more continuous and embedded approach to assuring quality and security – critical for managing risk in a fast-moving environment.

The survey shows continuous delivery being adopted to enhance DevOps and agile, but once again there is room for improvement.

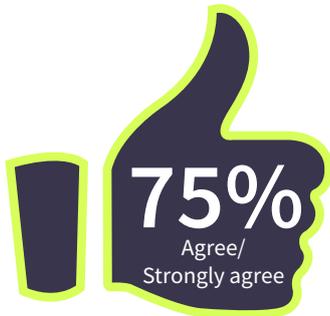
The Master Perspective "Agile and DevOps practices are the enablers of greater collaboration between those that architect, build, engineer and operate applications and infrastructure." *VP Cloud, Telco*

Exploit the synergies

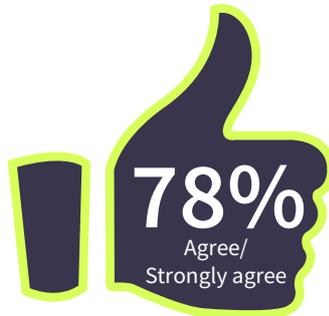
An essential recognition: agility is not just about IT

While many, if not all, large enterprises now depend on their IT function, business success needs to be built on a platform of agility that runs through all aspects of the modern digital business. It is not just about software development and IT operations.

How much would you agree or disagree with the following statements?



Our organization is embracing agile ways of working between different groups/departments



Our organization is benefiting (or could benefit) from agile working spreading throughout the company



Integrating agile practices with portfolio management allows IT teams to provide better visibility to business stakeholders

The survey shows that this is recognized in a majority of organizations. This comes from the fact that agile software development methods have their roots in approaches originally developed to optimize core manufacturing and business operations environments.

How much is the concept of “agile delivery” exploited in the different parts of your business described below?



Indeed, the survey reveals that in many organizations, the concept of agile delivery is also used in specific areas of everyday business. The key takeaway from this, however, is that you need to achieve maximum alignment and synergy between the agile ideas and processes on the business side and those on the IT side.

The Master Perspective “Our journey started in technology, but we realised that we needed to engage the business earlier as we considered new options and ideas.” *Chief Architect/CTO, Retail*

From the people perspective

Skills and experience are hard to find

Looking at IT specifically, it is obvious that skilled, experienced staff able to operate effectively in agile / DevOps environments are in short supply. The focus has to shift to training, but training takes investment. Combined with recruitment being challenging, the culture and the level of management commitment both need to come under scrutiny.

How easy or difficult is it to find professionals with the following skills?



It's not all about technology and process

Taking this point further, the survey results highlight a widespread recognition that implementing agility across the software lifecycle is not just a matter of new skills and working patterns. For some, it also requires a significant shift in mindset and behaviour. Making those changes is very much a people issue – and a senior executive issue at that.

How much of a priority is it to change the following in order to improve effectiveness?

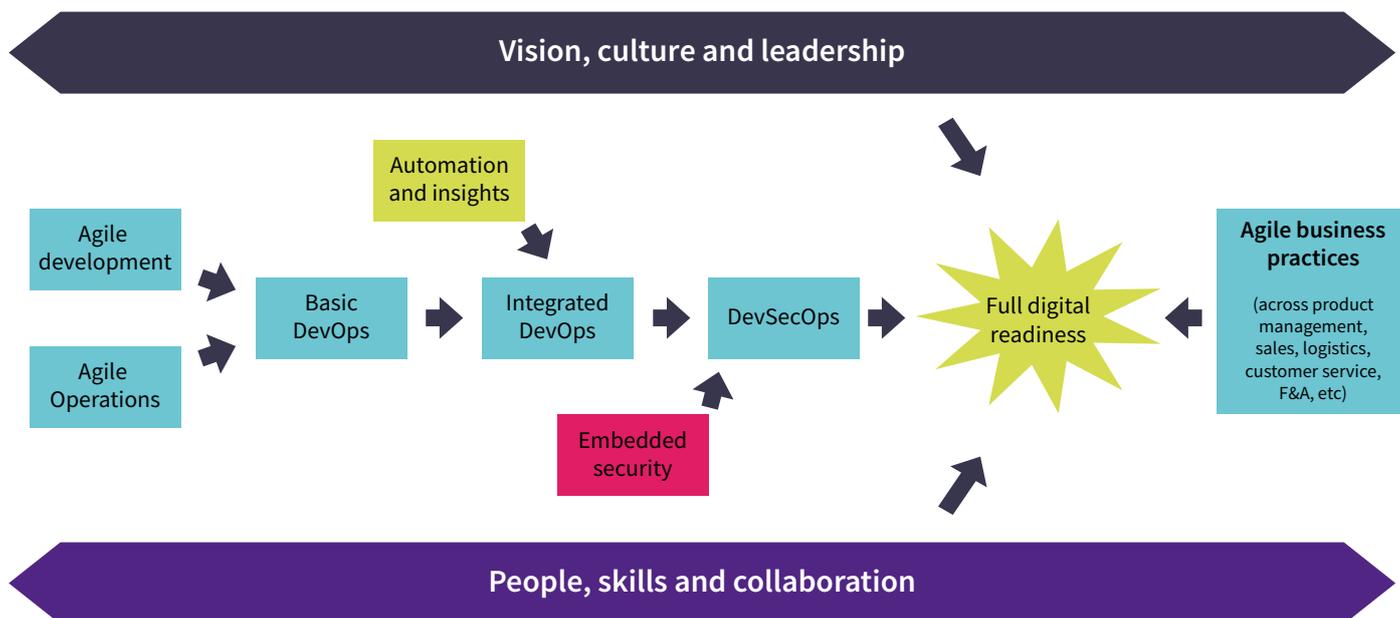


The Master Perspective “Raising the capability of the engineering team through a well-crafted careers development program will allow us to continue to recruit and retain high calibre individuals.” *Chief Architect/CTO, Retail*

The Masters of agile and DevOps

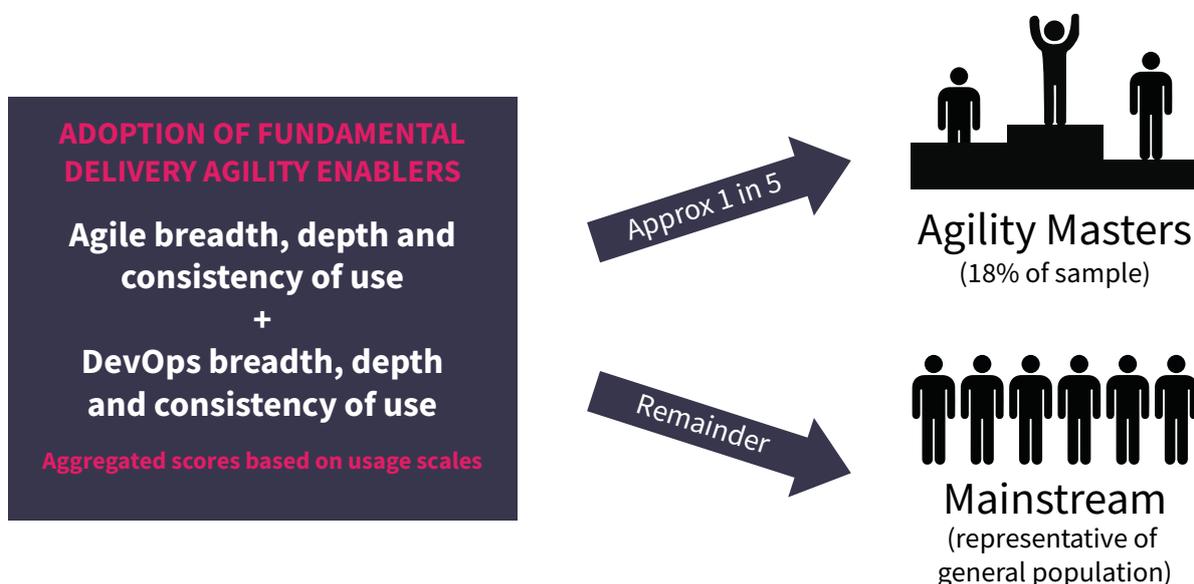
Business and IT agility are journeys, but there are some common paths to be taken. The challenge is to keep the team coordinated and aligned toward the common goal.

A more complete picture of the road to digital readiness



Homing in on those with superior capability - the Agility Masters

To get a better understanding of the difference it can make when you get good agile and DevOps capabilities in place, we aggregated our respondents' indications of how well they are doing on each of the six fundamental delivery enablers shown on page 6, and then separated off the top 18 percent as our Agility Master performers.



The figure of 18 percent was not picked at random – we observed distinctive groupings around this percentage throughout our survey, for example when respondents rated their effectiveness on meeting software delivery goals. Nor are the 18 percent necessarily the top performers on every measure – some may have rated themselves highly on five counts but not on the sixth, for example.

The Master Perspective “Agile offers a more responsive approach to deploying resources to problem areas. Moreover, well-executed DevOps has shown itself to be vital for innovation, reliability, control and governance.”
CTO, Digital Audio Vendor

Vision, leadership and alignment of objectives

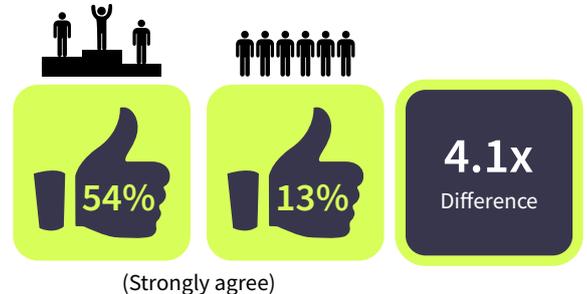
When we compare our Agility Masters with the remainder – their mainstream peers – what differences shine out, and where is superior performance achieved? While the mainstream responded 'Agree' to a wide range of metrics, the Agility Masters more typically responded as 'Strongly agree', with all the apparent benefits that follow from that.

Customer alignment and strategy

Starting with a core fundamental that organizations must do well to move forwards in very competitive environments, the survey highlights that Agility Masters are over four times more likely than the mainstream to agree strongly that their company have the correct vision and strategy.

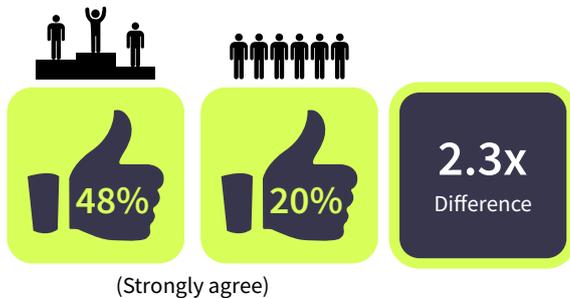
More importantly still, they also strongly agree that they understand customers' needs. Vision must be backed by insight into what the customers want, need and expect.

Our company has the right vision and strategy



Leadership and company culture

Our company's culture supports risk-taking



Building on top of this, Agility Masters are 2.3 times more likely than their mainstream peers to strongly agree that their executives provide the necessary leadership.

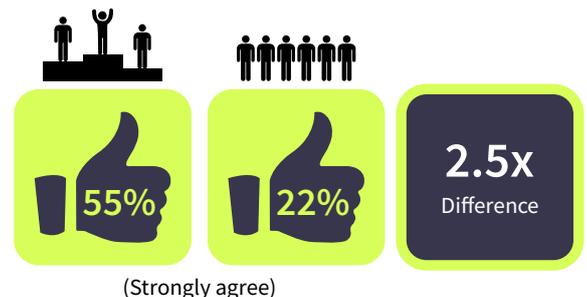
A similar differential is also clear when looking at whether the culture of the company supports risk-taking. Good leadership is valuable, but it must be matched by a wide-spread acceptance of taking risks, especially when moving into new areas.

IT and Business alignment

In order to exploit good vision and business strategy, it is essential that IT and business share an understanding of what the organization must do to move forwards effectively. Agility Masters are two and half times more likely to report that their business and IT executives strongly agree on what they need to do.

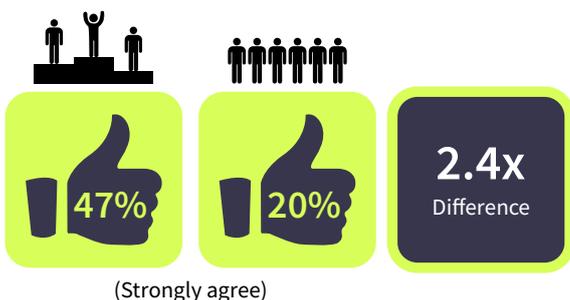
In addition, without the software team also seeing that same picture, executive agreement may not translate to success. Agility Masters are 2.3 times more likely to strongly agree their software team is well aligned to strategic business goals.

Our IT and Line of Business executives agree on what's needed to drive the business forward



Culture breeds success

Our culture and practices support collaboration across development, operations and IT security



The survey results show that Agility Masters are 2.4 times more likely than their peers in the mainstream to agree strongly that the organization's working practices support effective collaboration between key IT teams in software development, operations and IT security.

There is still room for improvement though: only half of Agility Masters strongly agree that their company culture supports collaboration, even though this is twice the proportion in mainstream organizations.

Agility Masters appreciate key imperatives

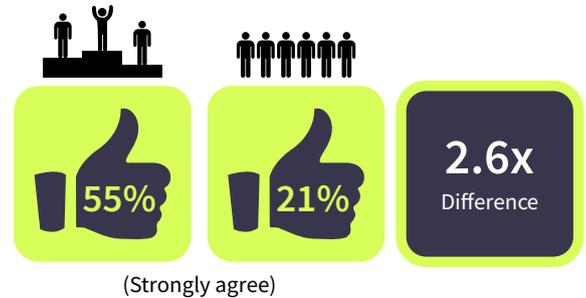
There are notable differences between the Agility Masters and their colleagues in the mainstream when it comes to the wider picture, and in particular those elements of IT too often seen as 'mere background'.

Security and testing

In today's high-pressure threat environment, the security testing of applications is an obvious concern. To combat ever-more sophisticated security threats, Agility Masters are 2.6 times more likely to strongly agree that app security needs to be tackled earlier in the software development process than has traditionally been the case.

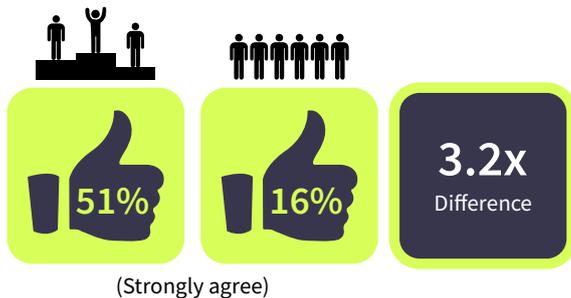
They are also just as likely to strongly agree that, in order to get software into the hands of customers more rapidly, continuous testing needs to become pervasive across the entire DevOps cycle. Security threats alone mean testing can no longer remain the afterthought it has been, but should be embedded in every step of software design, creation, deployment, and operations. New external regulatory requirements reinforce the need for this change, and some will also add the requirement for similar security considerations at software end-of-life.

To address customer and speed-to-market pressures, continuous testing needs to be pervasive across the DevOps cycle



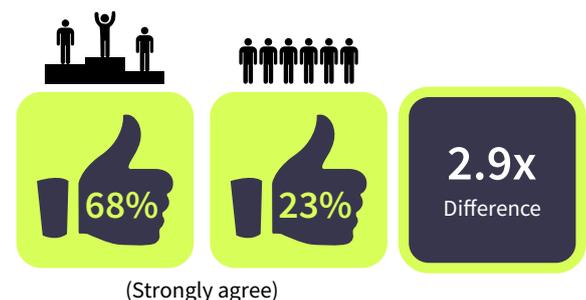
Agile and Portfolio Management

Integrating agile practices with portfolio management allows IT teams to provide better visibility to stakeholders



IT is expected to respond rapidly to highly variable customer requirements. This places great pressure on developers and operations to be able to move at a moment's notice. But as the number of apps being developed and run continues to ramp up, it can be difficult to work out how to prioritize change. Agility Masters are over three times more likely to strongly agree that portfolio management has a key role to play.

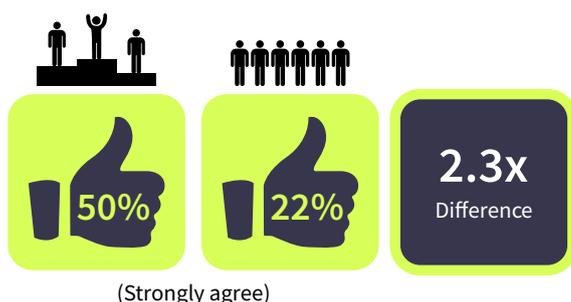
Our software development teams are skilled in the latest tools and development trends



Masters unlock the potential of people

Managers, whether in IT or elsewhere in an organization, will tell you "our people are our most important asset". But Agility Masters are much more likely than the mainstream to strongly agree that their software development teams are skilled in the latest tools and techniques.

Our organization provides regular training for continuous skill development



There is no denying the value of good staff, but in an IT environment where continuous change is a reality, skills need to be updated regularly. Agility Masters are 2.3 times more likely than their peers to strongly agree they provide regular training, although even then it is only 50% of the Masters.

But rarely do individuals alone deliver success: teams also need to change, and the Agility Masters are, once again, well ahead of the mainstream.

Business agility correlates with positive results

No matter how quickly IT can create new software and get it out to the users, the business will not achieve maximum success unless agility is integral to all parts of the organization. Agility Masters demonstrate this in several key areas, and the benefits are clear.

Agility Masters agree - agile and DevOps are better together

Agile and DevOps are more effective when implemented together than each on its own



(Strongly agree)

Earlier in the paper we highlighted the fact that, according to a majority of our survey respondents, agile and DevOps are more effective when used together than when either is implemented alone. Both DevOps and agile still have scope for broader utilization in many organizations, but analysis of the data highlights that Agility Masters are showing the way forward.

Agility Masters work in more agile organizations

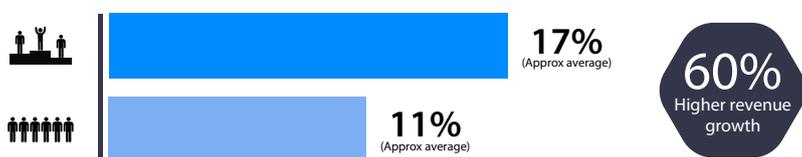
Being agile in software development and IT service delivery and operations is all well and good, but true enterprise agility requires most, if not all, parts of the organization to be flexible and responsive. The fact that agile processes have their origins in manufacturing helps us to understand that agility has never been just an IT goal. But the organizations of the Agility Masters enjoy much broader levels of company flexibility, helping them to meet new challenges effectively.

	Widely used here by Masters	Widely used here by Mainstream	Difference
Core Production/Operations	66%	29%	2.3x
Customer Service/Support	58%	31%	1.9x
Sales Organization	49%	29%	1.7x
Marketing and Communications	53%	32%	1.7x
Product Development & Research	52%	32%	1.6x
Finance, Administration and HR	52%	26%	2.0x

Agility Masters enjoy healthier top and bottom lines

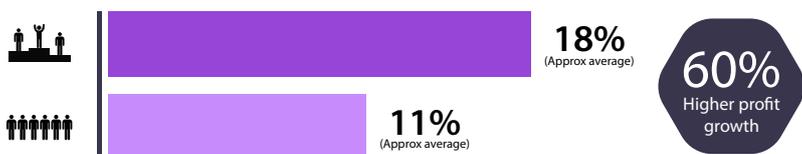
In most commercial organizations the key metrics are simple – revenue and profit, combined with how these vary year to year. The inference is that growth implies a successful organization in a competitive landscape. The Agility Masters appear to fare significantly better on both counts.

Approximately how much has your organization’s revenue changed over the last year?



Agility Masters reported 60% higher average revenue growth, and were 2.4 times more likely than their peers to be growing at over 20%.

Approximately how much has your organization’s profit changed over the last year?



Agility Masters also reported higher rates of profit growth than their mainstream peers.

Causality must not be inferred from these correlations, as there will be many other considerations involved in revenue and profit growth. That said, high-performing organizations are more likely to effectively and broadly employ both agile software development and a DevOps approach.

Driving your enterprise's agility agenda

Agile development and agile operations provide a firm platform

Agile software development and agile operations are essential foundations on which to build an IT environment able to keep up with the rapid change in business demands. But transforming software development or IT operations in isolation will only get you so far. You need to zoom out from individual processes and silos, look at how everything works together, and adopt an over-arching DevOps approach.

Agile and DevOps together enable IT flexibility

Agility Masters show that implementing agile software development and DevOps together in a coordinated manner is far more effective than adopting each discipline separately. But to do so means you have to align and communicate objectives and metrics, and ensure they are well understood across your teams. You also need effective feedback mechanisms at every step of the software lifecycle - from design, through software creation to service delivery and eventual retirement.

DevOps needs to be hardened

Getting the full benefit of agile and DevOps means broadening your use across all or most application types, but this will only be possible if steps are taken to deal with enterprise requirements such as productivity, cost-efficiency and especially risk-management. The necessary controls need to be baked into all development and operations processes, not just through adoption of modern methods and best practices, but also by encouraging the right behavior among the individuals involved.

Security must be embedded throughout the IT lifecycle

IT security must be the concern of everyone; it can no longer be considered a stand-alone step or 'bolt-on' to software development, nor as an isolated function within IT Operations or elsewhere. Security management and assurance needs to be embedded in every process, and must be automated as far as possible. DevSecOps, with continuous security monitoring, is becoming the standard approach, but it's a journey that has only just begun with IT, let alone the rest of the organization.

The whole business needs to be agile

IT Agility offers great potential benefit to the organization, but to fully exploit the flexibility that it can now provide to business services, the rest of the enterprise needs to be just as agile in its daily ventures. After all, a company is only as agile as its least flexible or efficient function or hand-off. You therefore need to look across the traditional IT/business divide, build appropriate bridges and coordinate key delivery activities. As pretty much any significant business initiative now depends on software as an enabler, this is especially important in relation to product and service innovation.

Digital readiness demands organization-wide collaboration and feedback

To act on the overall agility imperative, everyone needs to be ready to collaborate with the rest of the organization, regardless of their department and role. As part of this, IT can become a major influencer of business development if it engages proactively and/or is invited into product, service and market initiatives sooner rather than later. Instill an agility mindset, and back it up with effective cross-functional communication at all levels on ideas, plans and practicalities, and achieving digital readiness becomes a whole lot easier.

About the Research

The research upon which this report is based was designed, executed and interpreted by Freeform Dynamics Ltd in collaboration with CA Technologies. Data was collected from 1279 senior IT and business professionals via a global online survey across 15 countries during June and July 2017. The respondents were from organizations with a minimum of 1,000 employees or \$200m revenue and from a variety of industry sectors - Manufacturing, Financial Services, Telecommunications, Retail, Healthcare, Transportation/Logistics, Energy/Utilities and Public Sector (National only).

The overall topic of the research was 'Software lifecycle modernization' and questions on Agile and DevOps were asked in this context. A requirement for respondents to provide meaningful responses on the subject matter means the survey sample is skewed towards more advanced users. This is perfect for studying the nature of activity as we have done in this paper, but it does mean that care must be taken when presenting results in another context.

About Freeform Dynamics

Freeform Dynamics is an IT industry analyst firm. Through our research and insights, we aim to help busy IT and business professionals get up to speed on the latest technology developments, and make better-informed investment decisions.

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