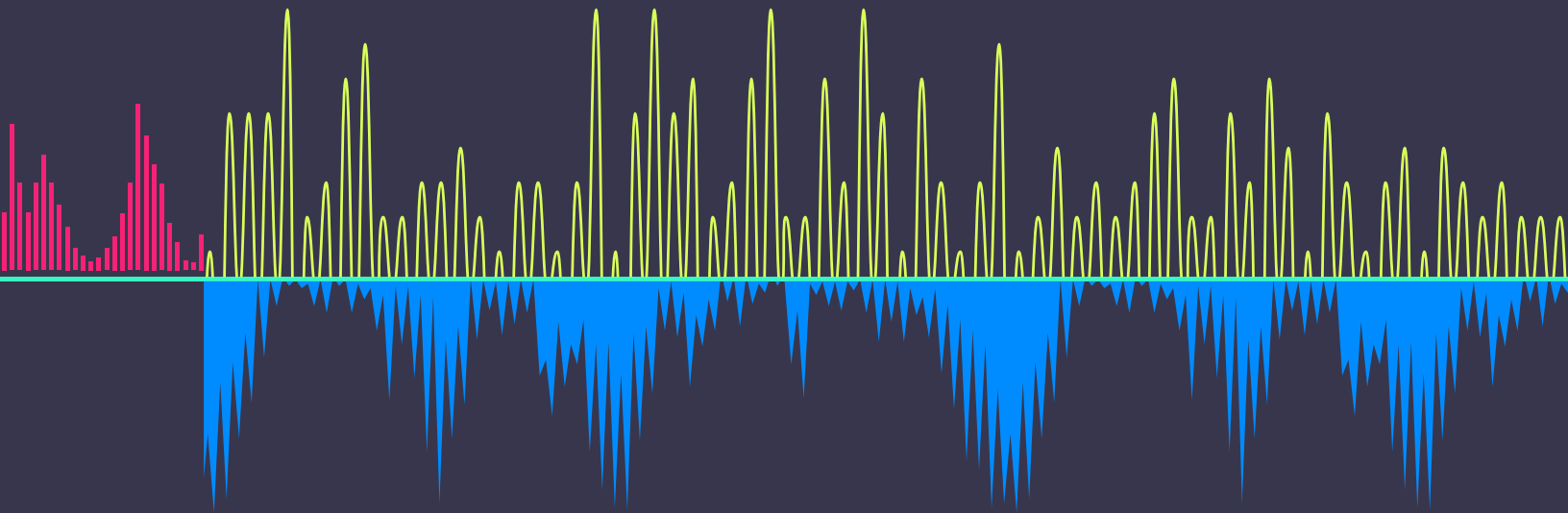


THINK YOUR ORGANIZATION IS ON TOP OF YOUR SOFTWARE DEVELOPMENT GAME?

WHAT YOU DON'T KNOW ABOUT
YOUR DEVELOPERS MAY HURT
YOUR BUSINESS >>





Today, software is on the critical path as you prepare to release a new product or service. You may be aiming to compete more effectively in your current market, enter a new market or gain early mover advantage in a newly emerging segment. Whatever your goal, software will be key to success—software that's ready on time and helps deliver a great experience to customers and other users.

But how well do you understand how software developers really feel about their jobs and how software gets built in your company? These are key people, after all—you trust them to make your launch, upgrade or new strategy work as you want it to. **You might be surprised at—and concerned by—what they have to say.**

The changing face of software development

New research about software developers, sponsored by CA Technologies and conducted by Freeform Dynamics, reveals a worrying disconnect between corporate goals for software development and what is really happening inside the teams and processes being used.

This matters today, perhaps more than ever before, because software is no longer just an enabling component, used to build a specific product. In some cases, software is becoming the business itself. In many key sectors, new software is the key to how customers and influencers experience a brand, connect with a corporation, access and pay for services and products, contribute ideas and opinions, and ensure that a brand stays competitive.

Most software development does not happen behind closed doors anymore, with specialists working to a product specification and on leisurely timescales. It is no longer a step-by-step process, with each component stabilized and tested before moving onto the next stage. It has become collaborative, open, increasingly rapid and often continuous. Most challenging of all is that software development includes the public, customers and other people with opinions who want to try things out and then tell you what's wrong, looking for rapid improvement.

To be successful, software has to work, not just as a way of processing transactions, but also in giving customers and other users an enjoyable experience that's memorable for the right reasons. Finally, every industry sector, in every part of the world, is moving at unprecedented

speed. New competitors that do not carry a legacy software burden are appearing continuously and are eating the market share of more traditional, established businesses.

Software development is expected to lead the charge for growing speed and flexibility. Our research suggests that most large businesses are not in a good place where this mission-critical issue is concerned.

What the research reveals

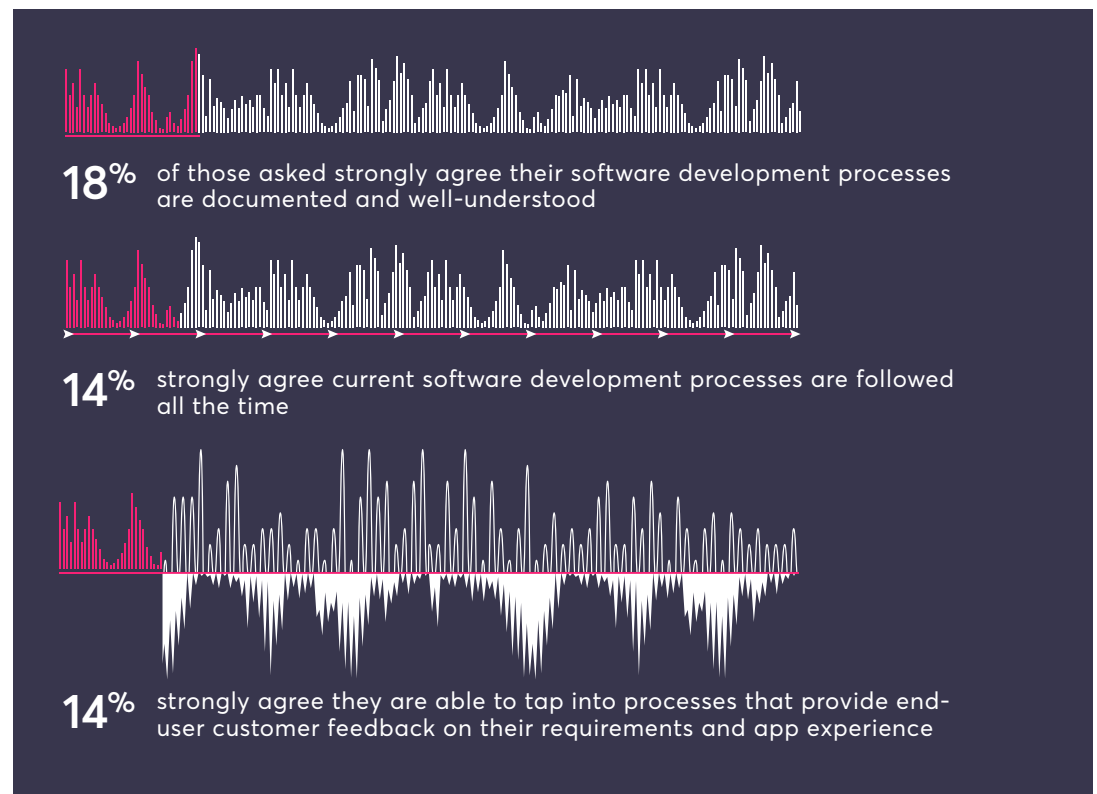
To help make sense of the insights from this research, while also developing ideas for addressing the key issues raised, we talked to Otto Berkes, chief technology officer of CA Technologies. Otto offers unique perspectives on software development, having also served as the chief technology officer at HBO, where he directed efforts that created and delivered products such as HBO GO®, and at Microsoft® as one of the four original founders of the Xbox® platform.

MAJOR FINDING: CURRENT SOFTWARE DEVELOPMENT PROCESSES LACK DISCIPLINE AND CUSTOMER INSIGHT.



"Software's potential can only be realized by working beyond traditional business functions and activities. Feedback loops are critical—from customers back into the development teams, so they can understand the impact software is having. Any gaps in that process will mean lost engagement opportunities, and may possibly damage the software experience or even the brand itself."

Otto Berkes,
chief technology officer



CA INSIGHT: SOFTWARE PROCESSES ARE NOT KEEPING UP WITH MARKET NEEDS, AND FEEDBACK LOOPS THAT INCLUDE CUSTOMERS ARE STILL RARE.

To understand how important and worrying this insight really is, we need to focus on how the fundamental role of technology within modern enterprises has changed. In the past, IT has been largely inwardly focused, aiming to optimize and digitize internal business functions. The ongoing and accelerating revolution around mobile connectivity and apps everywhere means that enterprises of every kind have to be more externally focused.

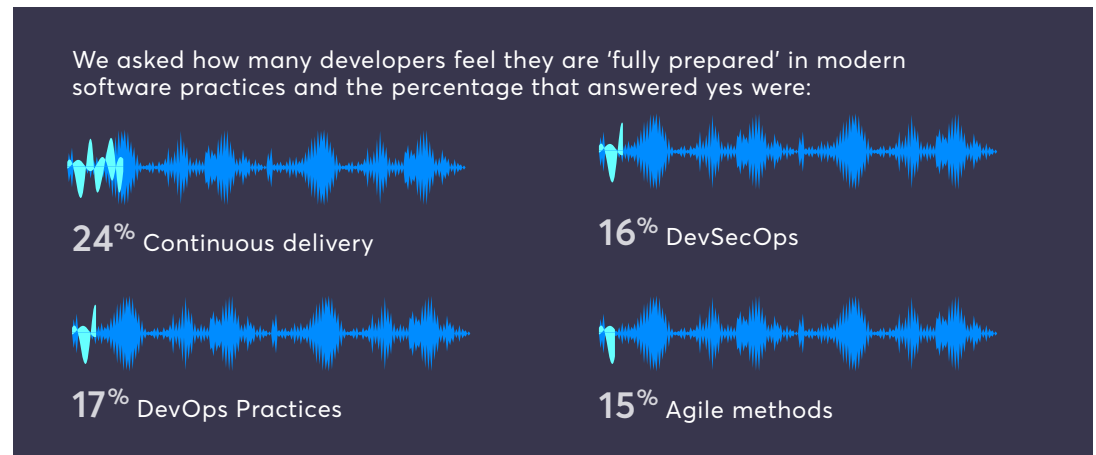
IT organizations are being tasked with doing new things, and many of them are either at the very start of this process or still don't really get it. Their developers—who are trying to define new ways of taking products and services to market, and aiming to connect with and keep the loyalty of their customers—are confused. And that means the companies they work for are also probably confused about direction and strategy.

All of us are seeing our attitudes and working practices revolutionized by the consumerization of technology. This has put technology on the path to democratization, so any developer can now access tools and resources at a mouse click. Big centralized IT is no longer needed to create value—this can be done today by freelance development teams using cheap open source tools, building highly targeted and localized 'digital native' apps, often without even telling the CIO.

The right approach is not to impose restrictions on creative developers, but to get the enterprise in tune with those people who best understand the most efficient, frictionless ways to create new value. That means operating in new ways and adopting new methodologies. Above all, it means listening to what developers say. The move to agile methodologies, for example, is a reflection of developers' desire to move more quickly and be freed from waterfall-type software building methods.

Going back to the first research finding: if developers feel they cannot connect with end users to understand how their work is accepted, or to pick up fast and usable feedback, then you have a problem. If there is a lack of understanding about the methods and a lack of consistency about how these are used, then you have another problem as well.

MAJOR FINDING: IT WORKERS ARE DOING THEIR BEST, BUT NEED MORE PREPARATION TO MEET THE CHALLENGES.



"How well your software factory works will determine your success in the market. New approaches to development and new modern methodologies are essential to driving speed of innovation and responsive, continuous engagement with your customers."

Otto Berkes

CA INSIGHT: A MAJORITY OF ORGANIZATIONS ARE SIMPLY NOT PREPARED FOR THIS KIND OF CHALLENGING, YET ESSENTIAL, PROCESS OF CHANGE.

The topics covered here are fundamental to the ways in which enterprises need to change their approach to software development in order to stay competitive. Judging by these figures, enterprises still have a long way to go in using new methods to create value.

We shouldn't be surprised by this. Simply defining the problem is tough, while making progress is tougher still and likely to be a multi-year process. It also seems these key new capabilities, which ought to be understood and accepted as basic requirements, are still seen by some as 'nice to haves' or add-ons.

Let's be clear that the evidence we have in this research is feedback coming directly from the workers, people who may have been thrown into different environments without a lot of formal training and skill development, learning as they go. It may not be surprising that they do not feel fully prepared. And we need to be aware of a certain paradox at work here.

Software developers see themselves, rightly, as being at the leading edge within fast-moving companies. Speed is important to them: apparently they thrive on it, they want to be agile, flexible, ready to change direction and capable of going faster than in the past. So isn't it a little strange to hear them saying they feel short-changed in preparedness? Shouldn't they be able to take all this disruption in stride?

The simple answer is no. If you want to have teams that feel comfortable with handling the unexpected, with being as agile as possible, you need to help them feel ready to do the job. They need new skills, new knowledge,

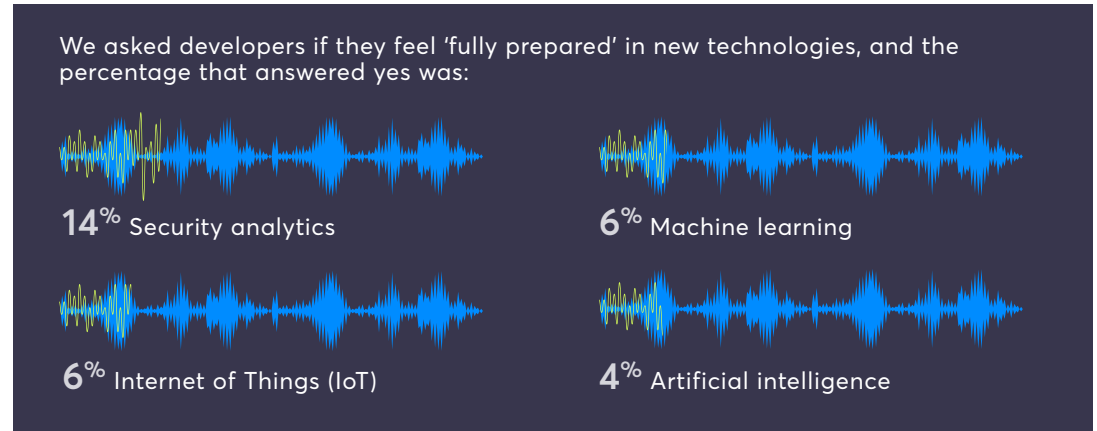
new training, and new levels of awareness. They also need leaders who understand the issues involved. There is no substitute for speaking directly with, and helping to prepare the people actually doing the work.

That's perfectly illustrated by one more finding.



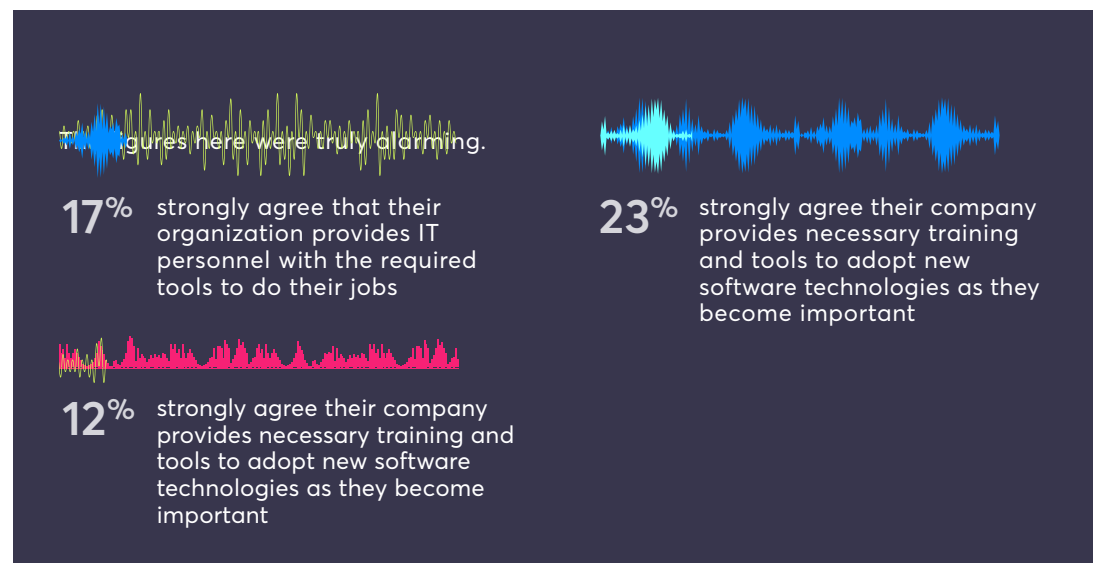
"The technology landscape is ripe for disruption and I believe that within a decade, how we use technology to drive business value will be fundamentally transformed. Today we are building intelligent enterprises that will be the foundation for how we work and live in the future, and new technologies such as machine learning and artificial intelligence will be at the center of that."

Otto Berkes



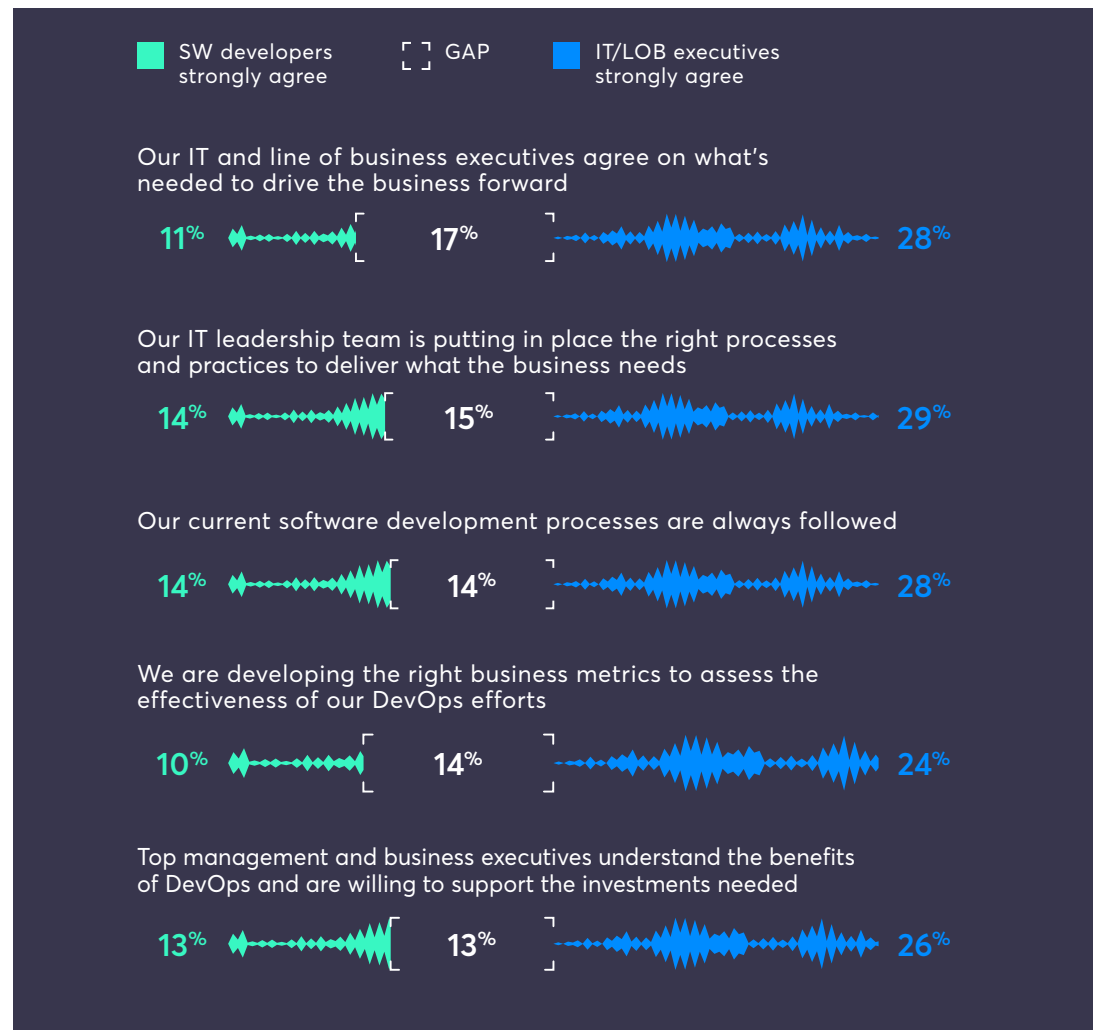
On the one hand, you can say these are emerging technologies. Despite a strong hype factor they are not yet in wide or common usage, so it shouldn't surprise us that the numbers feeling prepared might be low. But this low? That is not a good sign. Enterprises will increasingly depend on these and other disruptive technologies. We need to see a higher percentage of today's developers getting used to these technologies of the very near future. They need support and nurturing.

MAJOR FINDING: WORKERS NEED MORE SUPPORT FROM THEIR MANAGEMENT.



That's not the end of the topic, either. CA Technologies also sponsored a broader survey with IT and business executives and asked them many of the same questions put to the software developers (see ['Don't Let an Outdated Software Strategy Hold You Back'](#)).

There is a worrying disconnect between what executives believe is happening and what their software development and management teams know is really happening, as the table below demonstrates:



CA INSIGHT: MANAGERS AND DEVELOPERS SIMPLY ARE NOT SPEAKING OFTEN ENOUGH, OPENLY ENOUGH OR IN SUFFICIENT DEPTH.

Perhaps the least surprising of all research findings is that managers and their teams do not always see things in exactly the same way. A certain level of disconnect is neither unusual nor necessarily reason to panic.



“Given the central role that software plays in delivering superior customer experiences, any gaps in understanding between management and the developers who create those experiences need to be identified, understood, and resolved quickly or the business results will suffer.”

Otto Berkes

As with the other findings, it's not the discrepancy as such; it's the scale of it that causes concern.

Some findings show that managers simply do not understand enough about what is really happening on the ground. Twice as many managers believe that development processes are always followed as those people doing the work. Twice as many managers believe they understand the benefits of DevOps as those reporting to them.

When it comes to more strategic matters, the situation is even worse. Nearly three times as many managers than software developers think there is agreement on growth priorities. If these gaps are not closed quickly, there will be a growing problem about direction, priorities, understanding and mutual respect within the business.

The lesson to draw from this is that in the world of agile development, there has to be continuous communication around goal-setting, learning lessons and simply taking the time and trouble to stay on the same page—not so much as manager and employees but as team members. Investment in communication will pay rich dividends. Failure to communicate could kill your growth strategy.

The way forward

In today's marketplace, rapidly evolving software is a key factor in value creation, especially when much of that software is externally focused. The software used to enable customer interaction and deliver services is the key to brand integrity, rapid growth and profitability. External feedback loops are non-negotiable basic requirements now, and traditional development methods often will not work anymore.

That's because they are too rigid, too slow and too unresponsive for a world in which the normal way to work is based on trying things out fast, gathering feedback, adjusting, trying again—and where 'fail fast, improve faster...' is the key to success. The drive to agile and DevOps is not a fad—it's the only way to keep up, let alone be a leader, in a rapidly-changing market.

That is why CA Technologies has introduced a concept called the Modern Software Factory—a blueprint that will enable businesses to leverage core principles such as agility, automation insights and security to accelerate the delivery of high quality, secure software.

This approach requires a completely new way of working. The Modern Software Factory relies on small cross-functional teams, laser-focused



"Collaboration is easy to talk about but hard to do unless conditions are right. Culture has a lot to do with this, and changing behaviors is tough. It's critical to shift mindsets and focus to the value we are trying to deliver, the experiences we are creating, and the customer problem we are trying to solve. It's the key to competitiveness and requires a radically different approach than the traditional IT shop."

Otto Berkes

on building something of value quickly. The big question for corporate IT management today is how to capture the full value of what developers can create. That makes it vital to remove barriers and blur the previously rigid lines between developers and operations people within a coherent team.

Our research suggests that the message has not yet reached enough people clearly enough for them to respond effectively to the challenge. Managers still have not communicated well enough with their own teams, leaving many skilled developers feeling confused and lacking in direction.

The research conducted with IT and business executives also reveals that the organizations who have mastered the principles of the Modern Software Factory (approximately 25 percent in our survey) are also doing a better job addressing many of the issues raised by software developers. The 'Masters' are: 2.8 times more likely to have a culture that supports collaboration across development operations and security than the mainstream companies; 3.5 times more likely to provide tools and training to adopt new technologies; and three times more likely to have effective programs in place to rapidly transform their software teams. To be clear, software developers are some of the most important value creators in any organization. If they don't know where they're going, then they're in no position to create value. If developers and managers are not on the same page, then businesses will struggle to get their strategies right and gain competitive advantage.

There's a simple enough takeaway from all this: talk more, in greater depth and then listen to each other carefully. It's the essential first step towards profitability and growth.

About the research studies

This survey of 125 software developers was conducted by Freeform Dynamics in July, 2017.

It was designed to provide both breadth and depth in the insights gathered. It covered seven countries (the US, the UK, France, Germany, Italy, India and Australia) and eight industry sectors (manufacturing, financial services, telecommunications, retail, healthcare, transportation/logistics, energy/utilities and public sector).

The survey of 1,279 IT and business executives from 15 countries titled "Don't Let an Outdated Software Strategy Hold You Back" was conducted by Freeform Dynamics in July 2017.

About CA Technologies

CA Technologies (NASDAQ: CA) creates software that fuels transformation for companies and enables them to seize the opportunities of the application economy. Software is at the heart of every business in every industry. From planning to development to management and security, CA is working with companies worldwide to change the way we live, transact and communicate—across mobile, private, and public cloud, and distributed and mainframe environments. Learn more at www.ca.com.