DASA®

DEVOPS AGILE
SKILLS ASSOCIATION

DEVOPS; A MATURING DISCIPLINE

Rik Farenhorst, Nov. 2020

In 2016, when I was working in consultancy and facilitated several larger corporations with what we now usually call 'digital transformations' or 'DevOps transformations,' I wrote a letter to trigger a call to action from executives of such companies. Below is an excerpt from this letter:

> The digital age is behind us; the transformation age has begun. If you want to survive the so-called digital disruption—that is, prevent the Uberfication of your business—you must act immediately. Imagine simply ignoring existing management dogmas. Wouldn't that shed another light on your strife with the disruptive market players? Do you really know which startups have emerged recently in your markets? And do you think your organization has the agility and firepower to compete with the digital products and services that lure your customers away? If yes, you can sleep tight and feel confident that your digital enterprise is fit for the future.
>
> However, many executives fear the transformation age and its impact on their business. Chances are that you have the occasional nightmare. At times, you can't stop thinking about your IT departments that say, "No," your ineffective demand-supply operating model, or the technical debt accrued over the years in your complex, legacy-driven and vendor-locked IT landscape. During these sleepless moments you force yourself not to think about the ridiculously complex value streams that are "the processes" of your mighty organization, with all their manual handovers, waste, and error-prone activities. And instead of thinking of your—at best—mediocre workforce, whose morale and satisfaction

are only measured twice a year in generic surveys, you compliment yourself on your command-and-control, Taylorism-based management style. If things go sour, you can always call in a bunch of consultants to conduct PowerPoint wizardry, or leverage your Gartner subscription to initiate a new strategic program or reorganization.

But are you really in control? Do your customers value your products and services? Is your firm recognized as a leading player? Are your market shares growing, and is your firm agile enough to innovate at a fast-enough pace to outsmart the competition and stay in business? Is software also eating your world? Imagine that the nightmares have an element of truth to them. Then a fundamental redesign is the only thing that helps to create high-performance, agile organization model that continuously meets the high demands of your customers. Continuous innovation, adaptability, speed, quality, and customer delight then all become a necessity instead of a nice gimmick or "could have." So, stop wasting people's time! Bring the human component into focus and accelerate innovation!

But what does it take and where do you start? Unfortunately, there are no silver bullets here. Nor will it be a journey with a fixed path or known result. It will be disruptive and challenging. There will be resistance and fear among your people. Many of them will have to transform themselves to fit in your future in the first place. The journey requires strong leadership, courage, and a cultural change.

The funny thing is, I deliberately did not mention the phrase 'DevOps' once in my letter. Not only did I want to refrain from buzzwords and IT-driven lingo, but I also wanted to emphasize the business value and impact that could be gained from doing the right things.

Now, four years later, I conclude that the letter helped to shape the narrative around what DevOps means, or could mean, to organizations. Being a relatively young discipline, with its grassroots in 2009, it is not surprising that the DevOps discipline has matured significantly over the past decade. Like a virus, it mutated several times to match better with the key challenges it faced in the organizations it was destined to help improve. In this whitepaper, we discuss how the DevOps discipline has matured over the past decade. We also highlight some key themes that will be central in the coming years to help create as many high-performance digital organizations as possible. Throughout this paper, we build on the storyline that has emerged over the past five years in the 'DASA Whitepaper Series.'

DEVOPS AS A DISCIPLINE – THREE DISTINCT 'SCHOOLS OF THOUGHT'

When studying the trends, literature, conference articles, talks, meetups, and other community events reported by industry, we can define three distinct ways of talking about and working with 'DevOps.' Each of these DevOps 'schools of thought' has its roots in a different timeframe, as depicted in Fig 1. where we can see three schools forming from 2009 to today.

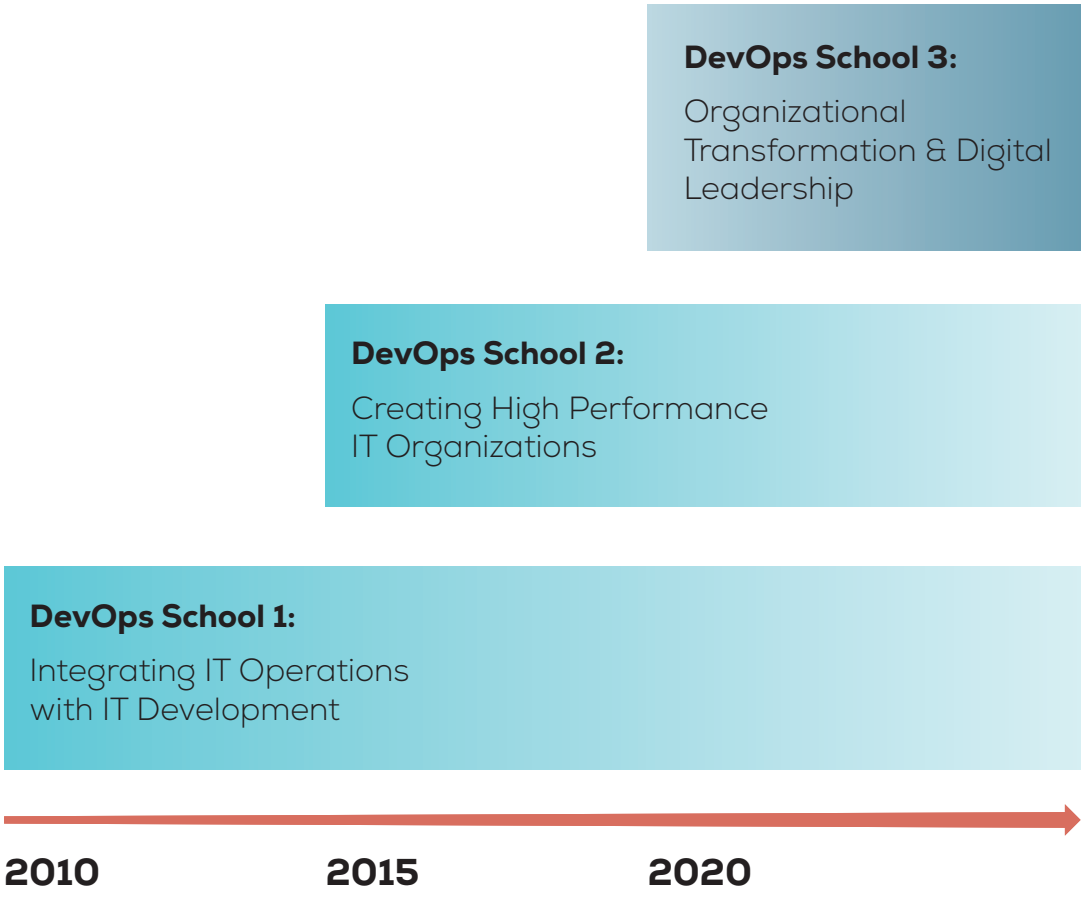

Figure 1: Three DevOps schools of thought

Note that the formation of a new school does not mean that the previous one ceases to exist. What we see is that earlier schools start fading out a little over time, simply because they get less traction, e.g. because things are seen as 'trivial' or 'business as usual' for more and more organizations.

Right now, in 2020, all three schools are prevalent. They are not mutually exclusive, and, in my opinion, there is no one school superior to another. Depending on the maturity of the organization, even today it could be smart to start a DevOps journey by following the key principles of school #1, instead of jumping immediately to large-scale organizational transformations. However, it is interesting to see as we will find out below, that over the past decade the focus of the 'DevOps' philosophy has less and less to do with IT alone or technology automation, which is why many digital transformations, performance improvement programs, organizational optimizations, culture change initiatives, and leadership development programs could well be 'DevOps-proof' or 'DevOps-enabled,' even without using the name. This can be a smart thing to do, since the phrase "DevOps" is very much "IT-ish," especially in the eyes of non-IT specialists, which can be a drawback.

Let us first discuss all three schools of thought, after which we reflect on what the future might bring.

DEVOPS SCHOOL 1: INTEGRATING IT OPERATIONS WITH IT DEVELOPMENT (2009 - ...)

This first school of DevOps emphasizes bringing together two disciplines that are—or have been—quite distinct in many enterprises: IT development and IT operations. According to Damon Edwards, co-founder of DTO Solutions, the DevOps movement was germinated in Belgium back in 2007. Patrick Debois, an IT consultant, was frustrated by the struggle, lack of communication, and disconnection between development and operations departments. He was planning to share the difficulties faced when playing a firefighting role on the Agile 2008 conference during an ad hoc 'Agile Infrastructure' session, but this session was cancelled. Via other conferences (Velocity 2009 and the DevOpsDays in 2009), the "DevOps" phrase became more widely known around 2009. The DevOpsDays events acted like a catalyst for the conversation and a grassroots movement that spawned tools such as Vagrant, Puppet, Chef, and Jenkins. This movement also started running circles around legacy enterprise IT systems.

As a side note in my opinion, a more appropriate name would have been "OpsDev" for two main reasons. First, all tangible software assets and value resides in "IT Run," i.e., IT operations departments. Second, when looking at the activity that helped DevOps become mainstream, the emphasis has always been on IT infrastructure: more and more work in the operations and infrastructure departments happens as development activities with scripts, code repositories, and build managers grow. OpsDev more explicitly emphasizes front-loading ops considerations—

relating to applications' operability, security, scale etc., early in the process.

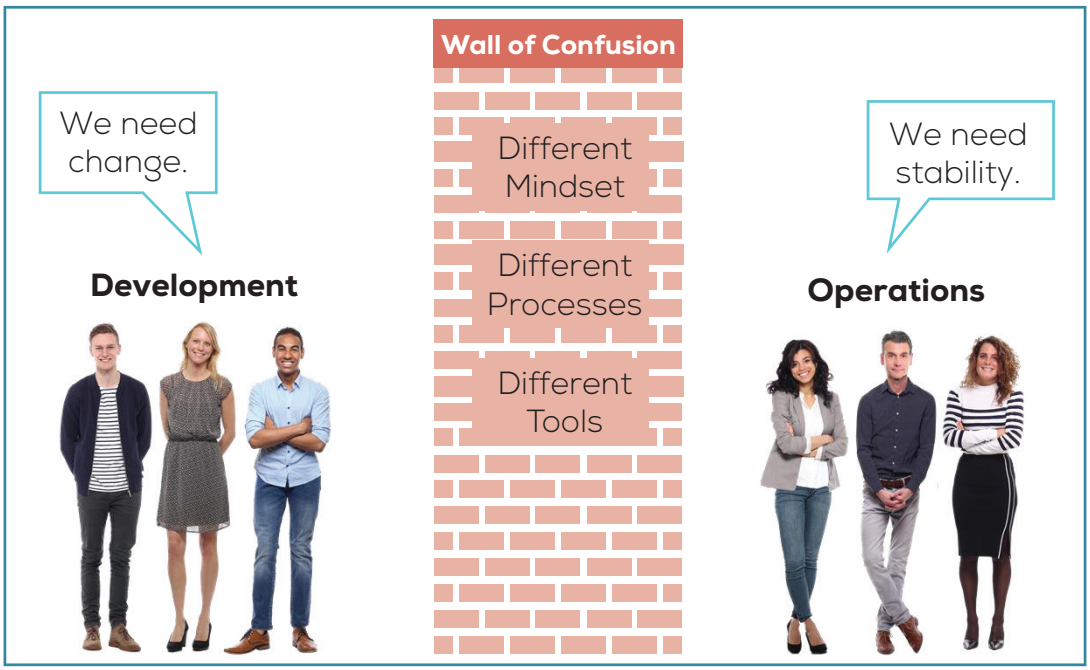

Figure 2: The wall of confusion

A popular way of describing the original intent of the DevOps movement is looking at how miscommunication and misalignment between IT Ops and IT Devs resulted in suboptimal IT in many organizations. This is often called the Wall of Confusion (see Fig. 2). Since developers usually have clearly different goals and incentives than operations change vs. stability, confusion and conflict are likely.

Driven by communities such as DevOpsDays, and led by many software vendors that jumped on automation (.e.g. Docker, Puppet, and HashiCorp) more and more modern IT operations solutions started to emerge. In later years, cloud native and complete serverless infrastructures became more and more the norm, further focusing on bringing full

automation, infrastructure as software, and self-healing platforms to the enterprise world, further threatening the traditional ITSM ops world.

Some well known leaders in research and industry helped accelerate the growth of the DevOps movement in the enterprise world. See Fig. 3 for a few recommended reads if you are new to DevOps and are exploring what value it could bring to your enterprise.

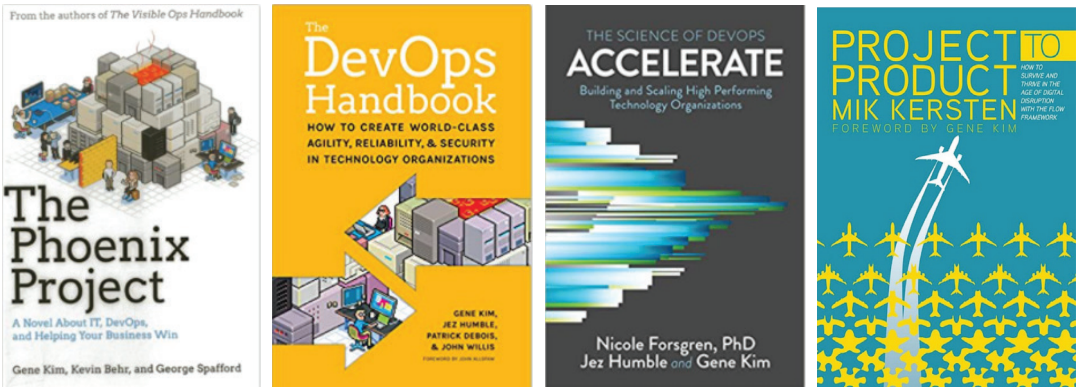

Figure 3: Recommended DevOps books for industry leaders

In Gene Kim's The Phoenix Project [1], we learn via an attractive storytelling approach (the book is written as a novel) why DevOps is important. It introduces "The Three Ways"—the underlying principles of DevOps processes and practices. The first way focuses on maximizing flow of work from left-to-right starting from business to development to IT operations to the end user. It introduces key considerations such as limiting the work in progress (WIP) volume, and removing constraints wherever possible using principles from the Theory of Constraints. These could be people constraints or be about processes or technology. The second way focuses on increasing the feedback loop

from right to left. The focus is not only on getting feedback but also on how fast we can get the feedback to make necessary corrections/improvements quickly. The third way is all about developing and fostering a culture of continuous experimentation and learning. The way to mastery is through practice and repetition. Fostering a culture of continuous experimentation entails taking risks and learning from both success and failure.

When looking at the three ways of DevOps described in the Phoenix Project, it becomes evident that although reasoned from a mainly technical perspective and put to use in IT environments, the message is about improving the overall IT organization and way of working. This approach helped create momentum for what we now could define as a new and second school of DevOps.

DEVOPS SCHOOL 2: CREATING HIGH-PERFORMANCE IT ORGANIZATIONS (2014 - ...)

The second school of DevOps emphasizes a more comprehensive view on improving the IT function of organizations. In the last decade, more and more organizations wanted to accelerate and were hampered by an IT department that said "no." Investments in automation started to happen (following the first school of DevOps), but especially larger corporates noticed that quickly building a continuous delivery pipeline alone was not sufficient. Quite soon, they ran into all kinds of organizational structure inefficiencies and started wondering how to become more of a startup, without restarting from scratch.

This led to more holistic approaches to DevOps. It was also the catalyst for the DevOps Agile Skills Association (DASA) in 2016. DASA claimed to adopt a more comprehensive and holistic DevOps philosophy from the outset one that didn't focus on the technical automation side of DevOps alone. The DASA competence framework is aimed at providing a comprehensive view on all knowledge and skill areas that IT teams and thus IT organizations need to invest in to grow to high performance levels. These competences include the leading practices on infrastructure engineering and continuous delivery we know from the first DevOps school, but also include e.g. business value optimization and business analysis to put the wider context of the IT department—and why it exists—in scope.

DASA's competence framework deliberately focuses on creating a high-performance culture in organizations and therefore blends culture, organization, processes, and automation practices, all driven by six core DevOps principles. A summary of DASA's competence framework, its six DevOps principles, and the key focus areas is depicted in Fig 4. Through communities such as DASA, the focus of DevOps was more and more put on creating a culture of high-performance, which helps organizations to accelerate, get more value out of IT, and eliminate waste. Some key ingredients of building high-performance IT organizations are described in DASA's first whitepaper [2].

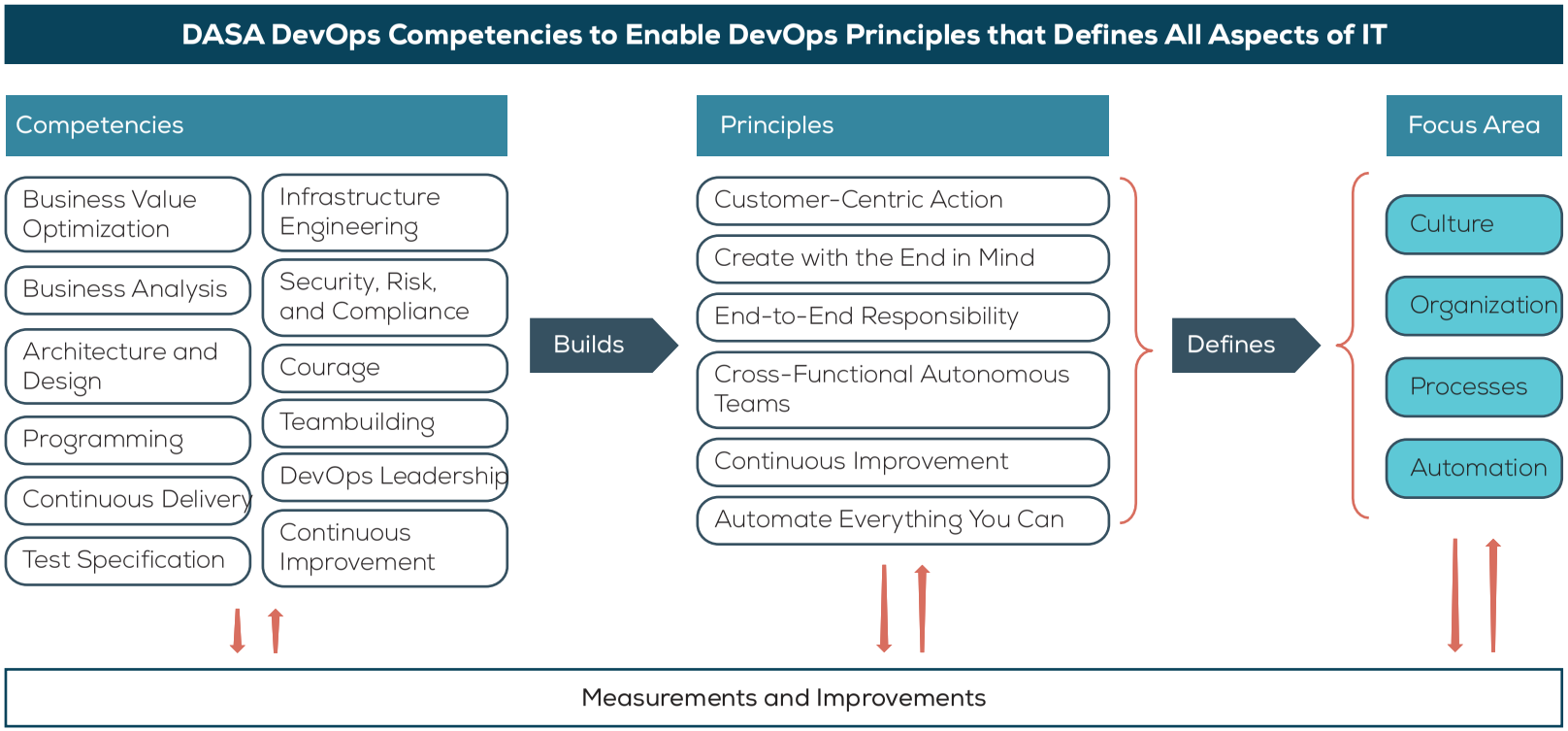

Figure 4: DASA Competences, DevOps Principles & Focus Areas

DASA's take on DevOps has helped many enterprises with investing more broadscale in their IT organizations, just at a time when they already understood the value of automating as much as possible (DevOps principle #6) and had already invested in modern ways of working, often based on Agile and Lean values and principles. This resulted in the more widespread understanding that DevOps could be an important addition to—or even the next maturity stage of—the agile way of working. See DASA's fourth whitepaper 'Lean and DevOps, all in the family' [3] for a nice summary of how Agile, Lean, and DevOps practices and principles all stem from common roots and ground. Because 'DevOps' got significant traction in the IT industry around 2015 and onwards, it made sense that this second school of DevOps started to grow.

What also helped position DevOps as an overarching discipline to create high-performance IT was the release of follow-up books by Gene Kim and friends. In the DevOps Handbook [4] Gene Kim and his co-authors describe several good practices that help technology organizations become more agile, reliable, and secure. Table 1 below summarizes key practices from the book.

Table 1: DevOps Practices - the DevOps Handbook (2016)

DEVOPS PRACTICES				
Small teams	Validate correctness in production-like environments	Quick, safe, and secure production deployments	Deployments are routine and during business hours	Fast feedback loops
Measure & reduce the lead time	Version control	Automated tests giving continual assurance	Fix problems as they are found	Small batch sizes–reduce WIP volume
Global goals outweigh local goals	Pervasive production telemetry of code and environments	Loosely coupled architecture	Shift-left on security	Dark launch capabilities (feature toggling)
Learning culture	Hypothesis-driven using the scientific method	Customer value-driven	Shared vision and goals	Empowered delivery teams (to act on vision/goals)
Collaborative Culture	Quality owned by everyone	Blameless culture to inspect & adopt	Fault testing in production to establish a fault-tolerant product	Shared ownership of outcomes

Building on this DevOps Handbook, Nicole Forsgren et al. published the book Accelerate [5] in 2018. Central themes of this book included the more automation-focused themes such as continuous delivery, but also related disciplines such as software architecture. As depicted in Fig. 5, it also put more emphasis on processes (Agile, Lean), culture, and product-thinking, in line with DASA competence framework and DevOps principles.

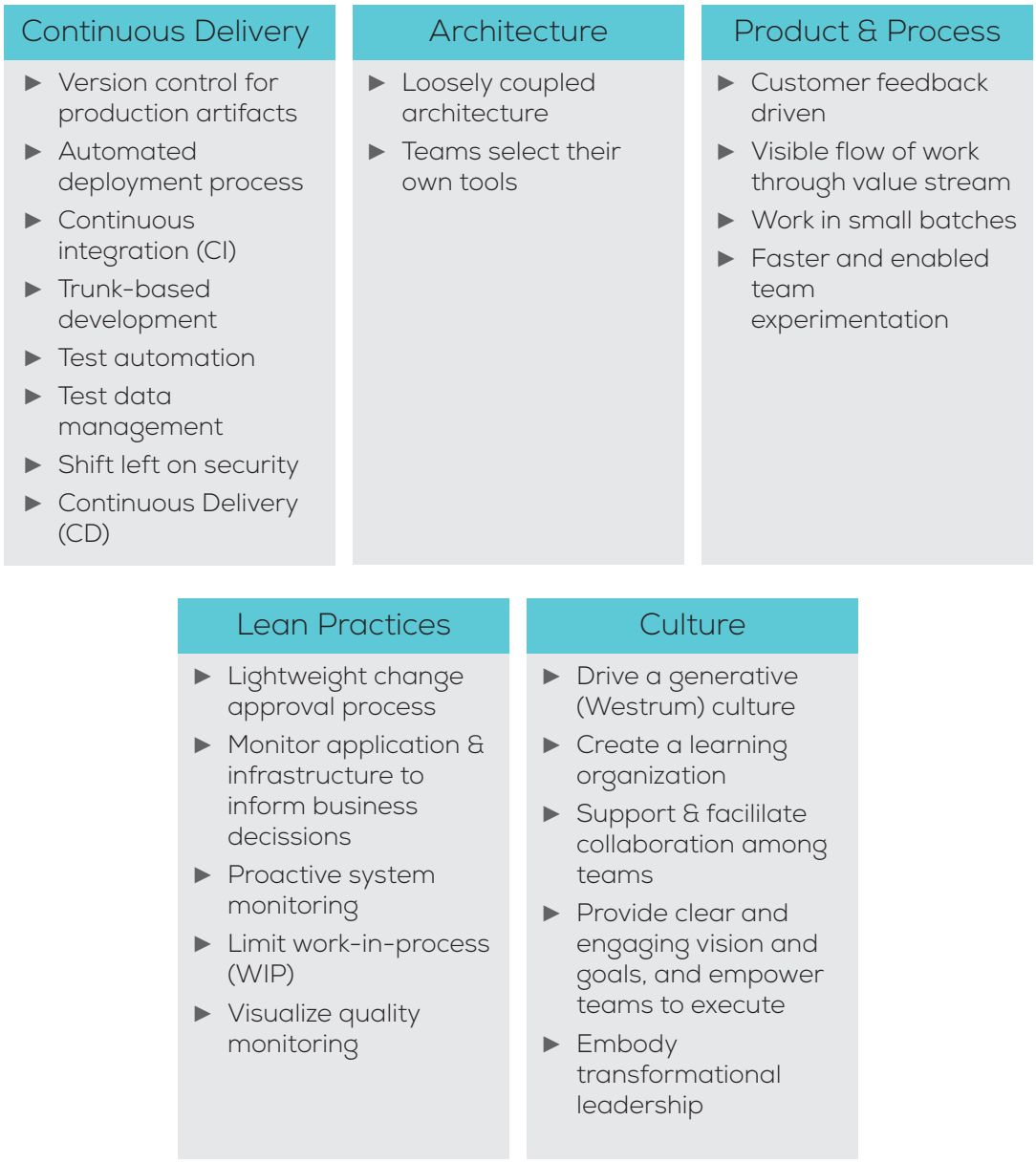

Figure 5: Key practices described in Accelerate (2018)

What is interesting to see in books such as The DevOps Handbook and Accelerate is that culture and organization are getting more and more attention. This has automatically resulted in more and more organizations thinking about how to successfully transform their organizations in such a way that business value optimization becomes increasingly

important. This has also shifted the narrative towards managers and leaders who not only control budgets, but typically also dictate (the speed of) change and transformation in enterprises. For example, in the first DASA whitepaper of 2016 [2] we wrote:

"Leaders of these organizations are now starting to realize that IT is a strategic differentiator instead of a mystical capability best left to techies who speak a foreign language. They read almost daily in newspapers stories that inspire them further. One type of story focuses on organizations that have been dramatically transforming by adopting an engineering culture, and moving towards a new world of IT."

Moving towards a new world of IT is promising and quite clearly brings a significant improvement in many organizations where IT is still lagging behind, and "the business" is demanding more and more, or taking the helm themselves. But purely focusing on building a high-performing IT organization soon runs to certain limitations as well.

After facilitating, guiding and coaching various organizations and their leadership with all kinds of digital transformations, and after being in senior leadership positions myself, I must conclude that in many organizations the scope, definition, and subsequently transformation towards DevOps is still done sub-optimally. What most leaders do not fully understand is that moving towards a new world of IT would be much more systemic and require a significant digital and organizational transformation that would call for a big step up in their own leadership and that of many others. Forsgren et al [5] call this "embodying transformational leadership." This is easier said than done for many managers. It did, however, create momentum for a third school of DevOps to emerge.

DEVOPS SCHOOL 3 - ORGANIZATIONAL TRANSFORMATION AND DIGITAL LEADERSHIP (2019 - ...)

The third school of DevOps emphasizes an even more integral and comprehensive view on improving and modernizing organizations, compared with the second school. The key difference is the removal of the adjectives 'IT' or 'digital.' Whereas the second DevOps school still primarily opts for improving the IT discipline inside-out, thereby crossing boundaries with various traditional business disciplines (cf. DASA's competence framework), the third school applies a more outside-in approach.

Enterprises in all kinds of business domains have been disrupted for quite some years now, and many have started to rethink the way they do business. They are realizing they are too big or rooted in too much history to simply 'start over again' as a new popular start-up, but are seeking ways to dramatically accelerate their time to market, modernizing their products and services, increasing customer satisfaction, and boosting employee morale and retention. Of course, for almost all these improvements digitization could play an important and leading role, but it is often not the traditional CIO or CTO who is leading the change. After all, to get lasting and meaningful change, often the emphasis (or problem) is not on technology at all. It is almost always more about human capital, organizational structures, governance, and leadership.

Research by McKinsey (see Fig. 6) recognizes that to improve digital effectiveness in an organization the key barrier is culture [6]. This explains why more and more organizations are setting up comprehensive transformation programs.

The key focus during these transformations should be on what I call digital leadership.

Culture is the most significant self-reported barrier to digital effectiveness.

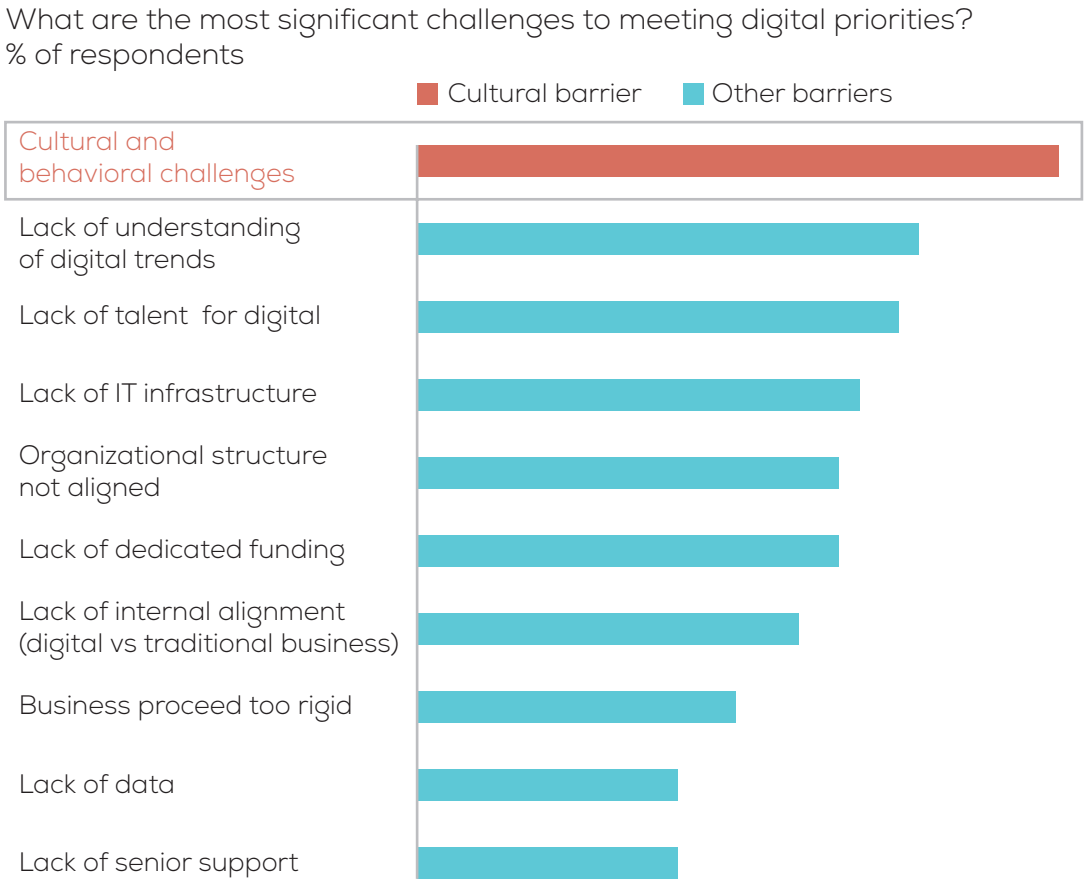

Figure 6: Survey of global executives on barriers to digital effectiveness (McKinsey)

In many organizations systemic transformations are started in lockstep with existing initiatives and programs to improve IT functions (cf. the second DevOps school). As a result, a significant opportunity arises for business and IT leaders to join strengths and arrive at integral transformations that smartly combine people, process, and technology, ingredients resulting in a high-performance culture and organization.

It turns out that the most important goals enterprises have to remain relevant, gain or retain market share, and remain attractive to customers and employees alike nowadays, which nicely correlates with key principles and values that we already know from the first and second school of DevOps. Business leaders, inspired by modern organizational theory and servant-based or facilitative leadership schools of thought, invest more and more in mission-command-style organizations where the autonomy and decision-making are placed as low as possible in the organization. The same business leaders understand that organization-wide agility is only possible if experts are given more control and an environment is driven by Mastery, Autonomy and Purpose (cf. Daniel Pink, [7]). In a similar vein, these business leaders understand, together with their peers from HR, that it is necessary to heavily invest in talent development and culture to attract and retain Millennials and Gen-Z colleagues. They also acknowledge the importance of creating a work environment focused around experimentation, learning, and innovation, because we cannot top-down predict or big-upfront design the next 3-5 years in this world that is inherently volatile, uncertain, complex, and ambiguous (VUCA).

All of this helps to plea for an organizational transformation that goes far beyond 'just' improving the performance of some Agile teams in the IT department. As it is nicely described in Mik Kersten's book 'Project to Product' [8], key principles of DevOps, such as the focus on 'end-to-end responsibility' and 'product thinking' should result in a completely different set-up of teams in your organization. I would argue that in many cases this would result in blending traditional 'IT teams' with teams residing in existing

business domains to create multidisciplinary product teams organized around value streams. In DASA's third whitepaper [9], Paul Wilkinson supports this. He writes:

"Business managers are an integral part of the cross functional team, to ensure that the business realizes the commitment they need to make in terms of product management involvement to help ensure business value is achieved."

This quote nicely highlights the potential impact of a transformation towards more multidisciplinary end-to-end responsible product teams. Many organizations safely start with improving the performance of various IT Scrum teams, but soon find out that several additional capabilities need attention and change as well. A few examples:

- Allowing product owners to mature into the role as envisioned by the inventors of Scrum, and to allow them to apply the original agile principles and values, means they need to be given space to act as mini-entrepreneurs. This has a huge impact on the leadership style required of product managers, business leads, and senior executives, the majority of whom in organizations still act according to more traditional, command-and-control management practices.

- Stimulating autonomy at the team level requires not only knowledge and skills but also a sense of ownership and responsibility by all team members to own the change and run of (digital) products and services that the team is working on. This has implications of how to divide company budgets, how to prioritize backlogs,

how to implement incident and change management in the organization, where to position the (IT) architecture function in the organization, and how to deal with all kinds of related IT governance capabilities.

- When agile teams start maximizing the value delivered to their customers, a comprehensive definition of various "types" of 'value' is required, e.g. one that includes technical debt and invisible qualities of products and services. This also often changes the way organizations do their strategic portfolio management and implement value monitoring.

- When creating high-performance teams you must devise a strategy for "getting the right people on the bus," requiring an integral talent management strategy not just for IT specialists. Collaboration with HR departments and the introduction of talent coaches and chapter leads etc. probably results in new ways of managing human capital.

A DevOps transformation thus often involves many more disciplines than just IT. The advantage of such a comprehensive approach is that the value case for the transformation can be made in real business value terms. I have seen many organizations struggle with investing in DevOps transformations because they still see IT departments as cost centers so why should it cost more (initially) in a world in which IT could lead to many cost savings. In a similar vein, investing in second-school DevOps transformations was often seen as a nice project of the CIO, but no real sense of urgency for the business was properly explained.

The need to express the Return-On-Investment (ROI) of DevOps in tangible business language was also described in the 5th DASA whitepaper by Mark Smalley [10]. He argues that "organizations have achieved significant results with investments in DevOps, but it is often difficult to articulate these in business terms." The improvements to the IT function often lead to better, faster, and cheaper IT services that—via the value of information—contribute to business goals.

"When DevOps improvements are restricted to the IT function, it is highly unlikely that any improvement to fitness for purpose will be made because the business function has to be involved in changes to functionality. But even without these extra benefits, a plausible claim can be made that investments in DevOps will be repaid by faster return on investments in functionality, fewer costly disruptions to business operations, and a better customer experience that reduces the risk of impaired sales and prices."

We have seen many attempts to find a proper phrase for this third school of DevOps in literature. This has resulted in variants called BusDevOps, to literally include Business in addition to the already well-known label DevOps. I would rather keep it as simple as possible. That gives two main options. The first one is to stick to the phrase DevOps while explaining which of the three schools as presented in this article is meant. The second is to refrain from using this IT-driven phrase at all and rather talk about the underlying goals, values, and principles of the intended organizational—and thus digital—transformation.

DEVOPS – WHAT WILL THE FUTURE BRING?

The three schools of DevOps represent a big shift from traditional IT towards building high-performance organizations. An organization's maturity and ambitions will likely determine which school, or schools, will resonate best and which starting points are best to pursue. Over the past decade we have seen many organizations, both small and large, jump on this 'DevOps' train one way or the other. I expect that in the coming five to ten years, this will only accelerate. Many more organizations will be forced to disrupt themselves and radically change the way they deliver value with digital capabilities. Doing more of the same while cutting some costs of the traditional IT department is not going to cut it.

So, what will the future bring for DevOps? My expectation and hope is that the term 'DevOps' itself will fade away more and more. Not because DevOps is not important, but because it becomes more mainstream and trivial for organizations to work according to Agile and DevOps principles. The focus will increasingly be on the high-performing culture and organization that is needed to thrive in this VUCA world we live in. I expect that more and more leaders will understand that this requires organizational and digital transformations that are more holistic and systemic than they might have expected or realized before. This insight creates opportunities for digital leaders who are now able to not only execute their own agenda by piggybacking on larger, more integrated and strategic organizational transformations, but also create more tangible value and impact for the enterprises they work in.

In DASA's Enterprise Leadership Forum (ELF), where we bring leaders from across the globe together to discuss these topics, the trends they see, and share best practices to learn from each other, the above expectation is being acknowledged. Members represent a nice mix between traditional 'business' and 'IT' disciplines and from their (senior) leadership positions they see a trend towards more integrated and holistic transformations. It is interesting to see how many different paths and starting points exist, which shows there are many ways to Rome, and every transformation is highly unique and should be defined tailor-made. Some common 'patterns' or proven practices seem to emerge more and more, and I like the fact that many of these are more culture, organization, or people-oriented, instead of focusing on technology alone. This confirms the shift in schools of DevOps that are being followed and shaped in practice.

Three topics that will need increased focus and maturity in many organizations to allow such transformations to become successful, are:

1. **Digital leadership knowledge, skills, and behavior:** unlearning traditional and growing facilitative leadership behavior, knowledge and skills unlocks a culture of innovation, experimentation, learning and continuous improvement.

2. **Talent management:** a strong human capital strategy and agenda is instrumental to accelerating and nurturing a company culture for digital winners.

3. **Change management:** ensuring that digital and organizational transformations result in lasting improvements and sustainable change.

In upcoming articles we will dissect these topics in more detail. If you are interested in learning more about these topics and putting them in practice yourself, these subjects will be discussed in depth in the upcoming DASA DevOps Leader course.

REFERENCES

[1] G. Kim, K. Behr, G. Spafford. 'The Phoenix Project – A novel About IT, DevOps, and helping your business win', IT Revolution Press, 2013.

[2] R. Farenhorst, Niels Loader. 'Embracing Digital Disruption by Adopting DevOps Practices', DASA whitepaper #1, 2016.

[3] M. Orzen, N. Loader. 'Lean and DevOps: All in the Family', DASA whitepaper #4, 2017.

[4] G. Kim, J. Humble, P. DeBois, J. Willis. 'The DevOps Handbook – How to Create World-class agility, reliability, and security in technology organizations', IT Revolution Press, 2016.

[5] N. Forsgren, J. Humble, G. Kim. 'Accelerate – Building and Scaling High Performing Technology Organizations', IT Revolution Press, 2018.

[6] J. Goran, L. LaBerge, R. Srinivasan. 'Culture for a Digital Age'. McKinsey Quarterly, July 2017

[7] D. Pink. 'Drive: The Surprising Truth About what Motivates us', 2018

[8] M. Kersten. 'Project to Product: How to Survive and Thrive in the Age of Digital Disruption with the Flow Framework', IT Revolution Press, 2018.

[9] P. Wilkinson. 'Active Learning Delivering Business Value', DASA whitepaper #3, 2017.

[10] M. Smalley. 'The Business Value of DevOps', DASA whitepaper #5, 2019.

DASA®
DEVOPS AGILE
SKILLS ASSOCIATION

www.devopsagileskills.org