

# DevOps

## Agility and Continuity gaining the best of both worlds

### DevOps: the new productivity frontier

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DevOps has become the new productivity frontier. Implicit benchmarks have been set by the new IT companies disrupting our industry and enabling new markets. By combining Development (Dev) Operations (Ops) in DevOps teams working closely together with the customer, a new level of productivity is reached resulting in a shortened time to market of new features and products. Companies like Facebook, Google, Netflix and Spotify are changing our customer's perception of the speed at which new features should be delivered: fast is not fast enough.

Having an advantage on competitors requires a company to respond fast to a changing market. Competitors from the early days are becoming today's partners in new dynamic ecosystems. Startups are disrupting industries with new business models with a shift from transactional delivery to service delivery. This all demands an Agile and Pro-active organization with IT becoming the primary enabler of new services and business models.

Shortened time to market, deliver better products, continuous improvement and reducing costs are demanding a change in the way teams are working together. Not only Dev and Ops have to work together but also the business parties (marketing and sales, -business development, customer care etc) have to get involved.

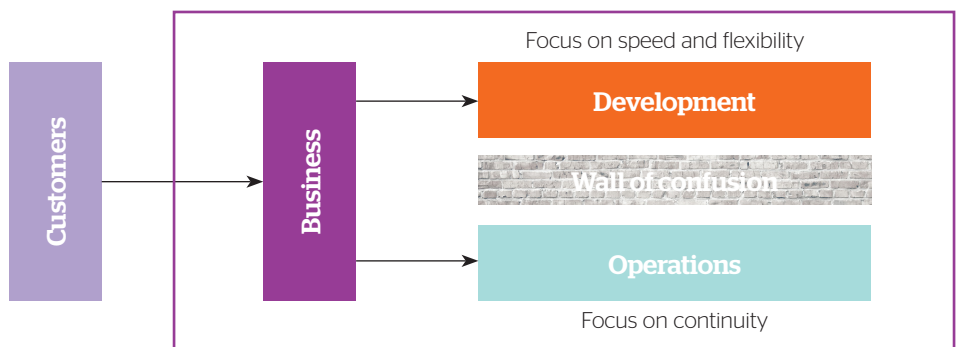
#### The pain

Organizational structure and walls of confusion. One of the key problems of long lead times of changes in IT and high costs is the way the IT department companies is organized. Development and operations are embedded in own organizational units. These units have different KPI's and contradicting incentives/goals: operations are responsible for continuity and stability while development needs to deliver new features. Though this organizational form has benefits in terms of competence development and utilization we believe a different organization enables collaboration, knowledge retention, competence sharing which brings benefits.

Figure 1 is clearly oversimplified: often we see siloes in development and operations as well. In development we have design, build, test and QA working in different departments. In operations we see the same pattern: network, storage, compute, database management and application management. All these departments have their own optimized way of working but we often see that the whole is sub optimal or even worse: not performing at all for clients we are working with.

The value of the product or service delivered to the customer is only established when the product is working; hence the goal of operations is to 'protect' the value of the system

Figure 1: Value chain with the wall of confusion between Development and Operation



# DevOps: Optimizing the complete value chain

by keeping the system running. The perception of operations is that this only can be achieved by keeping the system stable and therefore not changing the system. But changes will occur, the world is changing, heavy change management processes are put in place to make sure that nothing breaks, resulting irregular releases. Which in turn result in a slow pace of feature delivery. A consequence of the low pace of releases is threefold: (1) Manual releases are error prone. (2) The feedback time to development is long which means developers have to go back to changes they made months ago. (3) Releases are packed with changes making it hard to address the change that broke the system.

The key performance indicator of development is to add new business functionality to the software and IT infrastructure. Development expands the value of the service or product by adding new features. Whether this requires opening up a port on the firewall, introducing a new framework or moving through multiple layers of the architecture. Development will try to pack releases with as much changes as possible. In order to decide what features to add development is strongly involved with the business and optimize their delivery process by using Agile methodologies like SCRUM and Kanban and deliver potentially production ready software periodically.

The business is aiming to have competitive advantage. This can only be achieved by delivering a steady solution: keeping the system operational and extending the value of the service to the customer by adding new features. To enable future-proof product development they require feedback from the customer to adapt the product development and vision.

## The Kaizen Value Chain

DevOps is a new way of working where the different parties involved in the delivery of business services are working closely together. In DevOps the Development (Dev) and Operations (Ops) are working closely together as one team, hence: DevOps. These teams are small and agile: adapt to change, have high knowledge about the product and a strong responsibility for the product or service. In Atos' vision DevOps is not just about combining development and operations but also getting the business stakeholders working closely with the team.

The complete value chain of a product or service determines the quality of the product, the cost of creating the product and speed of innovation. In the end the goal is to have satisfied customers. When applying DevOps in our teams we have seen that the satisfaction of the customer increases, the grade given by our client for the value our DevOps teams deliver is 8+.

The promise of DevOps is a shorter time to market, improved continuity and stability, reduction of costs and continuous improvement (Kaizen) and innovation. Depending on your strategy these promises will help in satisfying the customer either by reduction of total cost of the service or by delivering new features faster.

Shortened time to market is reached by relying heavily on automation. Automation of QA activities by using automated testing and automated analysis of code quality. Deployment is automated with a single push of a button the new version of the software is deployed. A per feature release instead of big releases:

a constant flow of new features. This concept is called Continuous Delivery. Our teams have shown a 12 times shorter time to market opposed to teams working using a waterfall process.

The stability and continuity is improved by the extensive collaboration between development and operations. Monitoring the system constantly checks the health of the system, if something breaks the team fixes it immediately. Due to the small releases of the software the system can easily be changed resulting in a shortened time for resolution of bugs. We've seen a reduction of over 50% of bugs in systems taking this approach and even up to 100% reduction of regression bugs.

The reduction of costs is achieved by automation as well as fewer bugs and lesser problems during deployments. Deployments take minutes instead of days and are fully automated. Overall we see a reduction of costs up to 50% within our teams: less testing capacity, no more long days and weekend shifts.

This all results in more time for innovation and Kaizen: "good change", learning for improvement. Innovation and improvement can result in innovative products and services but also applies to the delivery processes. The latter enables operation excellence: more value for money.

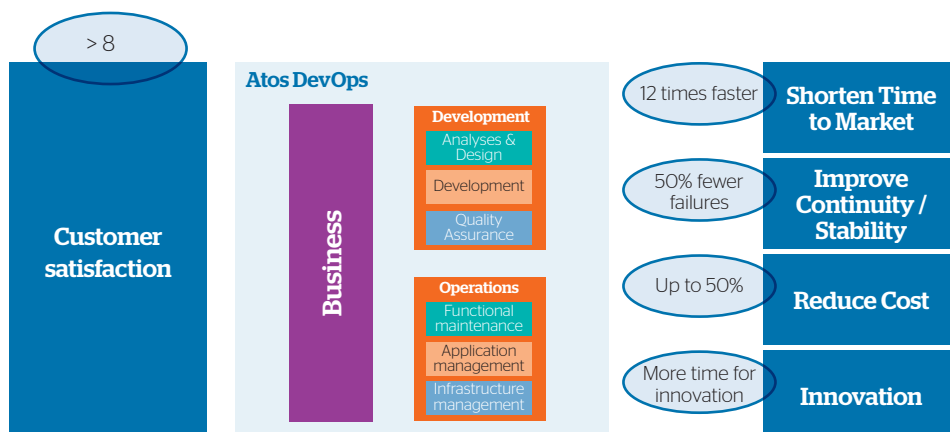
## DevOps is not an easy journey

Key areas of DevOps. Our DevOps solutions focus on the optimization of the complete value chain. DevOps is not an IT-only (r)evolution it impacts all parties involved in the system. We believe the required optimization can only be achieved by taking a system's thinking approach: the collaboration of customer, business, operations and development. Transforming an organization to the DevOps model requires an organization to iterate over different key aspects: organization and processes, people, learning and improvement, IT landscape and IT enablement.

### Organization and Processes - Agile for DevOps

Collaboration within and outside a DevOps team are key to great service delivery. An Agile delivery requires a different organization. One of the key elements of DevOps teams is to make them responsible for the product they

**Figure 2: The complete value chain of a product or service consists of all parties involved. The goal is 'customer satisfaction' which can be reached by the benefits of DevOps.**



# Key areas of DevOps

deliver and the way they deliver it. A common misconception is that a team is completely self-organizing and self-steering. Even the best DevOps teams need guidance: how else will they know if they are working in the benefit of the company. Multiple scaling frameworks exist to guide DevOps teams. We believe there is no one size fits all solution in scaling Agile. In our organization we use a combinations of the Spotify model (Tribes, Squads, Guilds and Chapters), Scrum of Scrums and SaFE but we see value in DaD, LeSS and Scrum at Scale as well.

Still questions remain: What happens to our change process when we implement DevOps? How do we benefit from Scrum and Kanban? What will happen to our Itil processes and will we still be able to conform to our security guidelines like ISO 27001? How do we change the incentives and align the KPI's in our organization? We see a lot of these questions when we talk to our customers. We believe all of these still have a reason for existence in a DevOps organization and work well in combination with DevOps.

## IT Landscape - Key element of DevOps

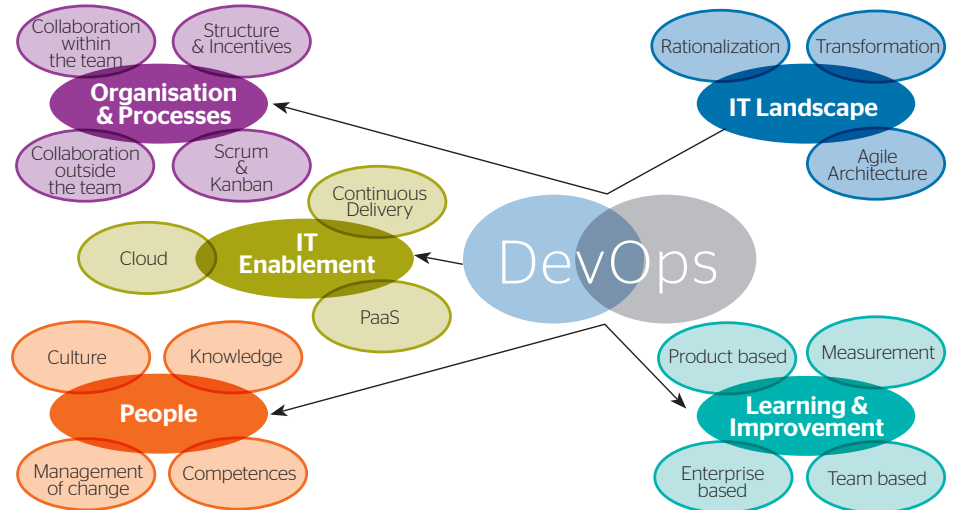
Conway's law states: "organizations which design systems ... are constrained to produce designs which are copies of the communication structures of these organizations". We often see teams responsible for layers within a landscape. In DevOps the team is responsible for (part of) the solution but always a business function (the team is not responsible for a technical component). Resulting in an IT landscape where products having a high cohesion and low coupling. This enables the faster delivery of new features as teams can follow their own release cycle if they respect the agreements with teams around them.

Implementing DevOps means the architecture of the landscape has to transform into services with a strong decoupling which enables the faster delivery of new features in the landscape.

## Learning and improvement - Kaizen a.k.a. Continuous Improvement

From the lean thinking movement continuous improvement (Kaizen) is taken into DevOps. Continuous improvement is done at different levels: the individual, team and organization. Create a mindset where people are continuously improving the products they develop, the processes and tools they use and the way they organize in order to reduce errors, improve stability and shorten the time to market.

Figure 3: Our plan of approach to reach an Agile IT organization using DevOps



## People - A highly skilled workforce working in strong collaboration

Our industry is based on the knowledge and work of people. In DevOps culture and the interaction of individuals is the corner stone of higher productivity. Instead of creating new processes and volatile organizations the interaction between individuals and teams are empowered. People are brought together in teams delivering a business product and are self-organizing around topics of interest. This can be either a topic from a professional interest but can be a topic of general interest as well.

In our vision the empowerment of people and the interaction between people is important. People need to feel responsible and empowered in order to gain the maximum of their productivity. After all doing something you like makes your productivity rise.

## IT Enablement - Continuous Delivery, Cloud and PaaS based solutions

Using Continuous Delivery quality assurance (QA) and operations are highly automated and performed by the DevOps team. Every new feature will be automatically tested and delivered into the production environment by the DevOps team (this does not mean it has to be done fully automated, a single press

of a button will do). By automating the QA activities using automated tests the QA cycle can be brought back from weeks of work to minutes providing the team with instant feedback.

Another enabler for DevOps is cloud. Not only has cloud a very clear proposition from a technology perspective but also a key differentiator is the pay-per-use model. Instead of having to invest on beforehand in hardware and servers a cloud solution enables to operate machines on a pay per use basis. From the technological perspective we see multiple initiatives which bring value. First there is the 'everything as code' movement. Infrastructure as code, software defined datacenters: it all enables to maintain the stability of the system and automated rollouts reducing human errors.

The cloud consists of multiple layers the infrastructure: often referred to as infrastructure as a service (IaaS) enabling teams to get compute, network and storage capacity with the click of a button. Platform as a Service (PaaS) where middleware components are made available via self-service portals: application servers, database servers, messaging services at the DevOps team's disposal within minutes.

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# Conclusion

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Reaching the new productivity frontier of DevOps means your organization has to adopt a new way of working and mindset. Atos has a clear vision how to reach this new level looking at your organization from different perspectives: the organization, IT enablement, IT Landscape, People and continuous improvement.

Most of our clients face challenges shortening time to market due to departments working in siloes. Breaking down these siloes by implementing DevOps and optimizing the complete value chain promises a shorter time to market, improved stability and continuity, reduction of cost and continuous improvement all in order to gain customer satisfaction.

Atos' track record shows that with implementing DevOps customer satisfaction increases significantly, regression bugs brought back to zero and feature lead times from weeks back to days.

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