The fundamentals of DevOps culture and how to transition to DevOps

Luciano Zapata
Isabel Redtzer

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1 Introduction

DevOps is an agile way of working within an organization. DevOps is characterized by having the development and operations working as one, working with automation and tools which allow it, and most importantly, it's about the mindset and the culture. DevOps culture itself is a combination of working in a blameless environment where the work is focused on transparency, communication, and collaboration. The transition into DevOps requires technical changes, new approaches in the way of working, and a change in the culture of the company. The conclusion which can be drawn from this essay is that DevOps doesn't work without the integration of the correct culture. [1]

2 Background

In this section, we introduce the importance of DevOps and having a DevOps culture. This should provide the basic knowledge to then understand chapter 2.3 where we go through how to transition to a DevOps culture.

2.1 What is DevOps culture?

During the early days of software development, the segregation between development and operations teams was very clear. Frustration and challenges were created when both teams for a long period had to integrate their knowledge and skills into each other's work at the end of a project. Since then, organizations have worked on how to improve both communication and understanding between the two teams to create effective collaborations, autonomous teams while still meeting the needs of stakeholders [7]. The technical part, such as creating tools for CI and CD, really contributes to teams working efficiently and quickly, but these tools themselves are no longer enough to create a collaborative environment that many organizations now talk about when referring to DevOps. An equally important part of DevOps is to be able to create a supportive organizational culture [11]. The very concept of organizational culture began to be studied some time in the mid - 20th century by Edgar Schein [9]. Mandi Walls [11] describes culture as a group of people's common values and behaviors, which aligns with the fundamentals in a DevOps-friendly environment. There are many tools and ways of working that can make an organization work in a more DevOps way, but creating a culture where the attitude towards striving for a more DevOps-friendly environment is encouraged, is what is important as well as the most challenging. To create a DevOps culture, you want openness, trust, and communication.

2.2 DevOps characteristics

DevOps culture is very much about breaking down barriers and creating transparency between the Developers and the operations teams, to create strong

collaborations and shared responsibility for the products that are created. Apart from clear communication, high transparency, and collaborations between teams, DevOps culture is also about creating an environment where continuous learning is promoted [6]. Creating a work environment where continuous learning is part of the workflow through, for example, fixed feedback, cross-team collaborations, and trust is a very important part of creating a DevOps culture. A famous management method for continuous improvement is the Deming Cycle, also known as PDCA (plan-do-check-act), where the focus is on analyzing and reflecting on the overwork to learn [4].

DevOps is also about creating an environment where everyone is responsible for continuously sharing their skills and knowledge as broadly as possible [3]. By creating a feeling that both developers and operations teams are both responsible for the development or failure of a product, it is more likely that both parties take each other into account in their day-to-day work. For example, it should not be the case that developers only focus on building a product and later hand it over to the operations team. Instead, developers should also take responsibility for making their implementations work as intended. This could for example be done by testing. By more clearly understanding the challenges facing the operations team, developers are more likely to be able to simplify deployment and maintenance. It is equally important for operation staff to understand the developers' goals and systems, to potentially help define the needs of a system and potentially create customized automated tests. By creating this transparency and understanding of each other's needs, you are in line with what is referred to as DevOps culture [1].

2.3 Transitioning to a DevOps Culture

First of all, it has to be acknowledged that there is no one way of adopting a DevOps culture and this becomes more evident the deeper you get into the topic. Several sources claim that they know how to create a DevOps culture optimally, this essay will summarize and try to find a common ground to embody the DevOps culture. Undeniably, multiple technical aspects are included in the transitioning to a DevOps organization but this essay will only go into the depth of what creates the DevOps culture.

2.3.1 What to strive for in a DevOps culture

According to Taylor [10] a DevOps team should include promoting communication and collaboration, which can be beneficial for any team. Taylor [10] also recommends setting common goals for the team which will allow everybody to feel included in the work being conducted. A big part of DevOps is also the ability to constantly make improvements and allow room for failure.

Davis and Daniels [3] write extensively on how to create a DevOps culture. First of all, they state that DevOps is characterized by communication and

mutual trust. To create a DevOps culture, you must start with having clear and defined goals, open and ongoing communication, and allow for dynamic adjustment within the organization. The cultural concepts have to include a thought about Retrospect. The Retrospective approach handles what has happened, what went well as well as what can be improved. This allows a team to evolve and become better at what they do. The second aspect mentioned in the cultural aspects is the Postmortem. This aspect is closely connected to the Retrospect since it goes over what happened and debriefs to find remedies to what can be improved. An extremely important aspect is that these ways of working need to be blameless - nobody is supposed to take the blame for what has occurred, only strive to become better next time around.

Davis and Daniels mention that we should strive to transfer information and progress through the departments. In other words, one should strive to avoid silos, which means that we want to avoid not sharing information. Furthermore, we want to allow similar departments working closely to use the same processes and tools in their work. [3]

Creating a strong team is important for the DevOps culture, and it should be noted that this way of working may not be suited for everyone. According to the article Why some teams are smarter than others [12] teams should be based on communication, equal participation, and theory of mind to strive. This is something that is applied to the DevOps culture as well since it's built on having an open way of working where everyone is a part of the process. [3].

2.3.2 Challenges and what to avoid in DevOps culture

The vital challenges when transitioning to a DevOps culture are "Lack of collaboration and communication, Lack of skill and knowledge, complicated infrastructure, Lack of management, Lack of DevOps approach, and Trust and confidence problems". All these aspects are critical and should be considered when deciding to transition into a DevOps culture. Since all organizations are unique it's important to notice that these challenges can be of different importance. [5]

There are always challenges when conducting changes within an organization. An important aspect to consider when transitioning to a DevOps culture is the change of mentality. The mentality needs to be able to transition from having the development and operations teams separately. The teams should be integrated and break down the silos. The silos mean that there is no communication between the team and breaking down this added communication within the organization [3]. [8]

Organizations transitioning to DevOps tend to focus on the technical aspects, which is important; however, the priority in DevOps should be the team. A lot of focus should be put on the shifting of the teams toward the wanted culture.

The culture should, as mentioned priorly, be based on continuous improvement, autonomy, empathy, trust, and cross-team collaboration. [1]

The way of handling setbacks can be quite rooted in a project. A possible challenge for transitioning into DevOps culture can be the handling of blame. It's important to move the organization away from the blame culture and only try to identify how you can become better as a team. You have to move away from root cause analysis since this tends to identify a single cause and does not connect to a bigger complex system.[3]

The final challenge which we will mention is the resistance to change. To transition into new routines and ways of working teams have to be open to change and since people tend to fear the unknown this can be a challenge for the organization. To successfully progress into a DevOps culture you have to let the changes take time. This will allow all the members of the team to adapt and get used to the DevOps way of working. It can be beneficial to start small with a small product and remodel the work with that part into DevOps. When team members start noticing the positive changes on their own the transition to DevOps culture will grow organically. [8]

2.3.3 Companies that made the change

Amir Razmara, CTO of Code Avenue, explains that their change to DevOps has been a continuous journey and that they based their DevOps culture on continuous learning. He also claims that it's important for all the people at the company to be able to adjust to new processes and ways of working. He also mentions that it's important not to fear failure. Failure and iteration are a part of the DevOps journey and it's better to learn from the mistakes made. [2]

Damion Jones, CEO of Blue Pisces Consulting, explains that the DevOps culture at their company is built on communication, collaboration, and coordination. He mentions that it's important to see that the same methodology will not work for all companies. He also explained that taking in feedback from your employees is crucial for the transition. [2]

John Unger, a team lead at IMC Trading, puts his focus on the DevOps transition on ownership and common goals. He claims that the most relevant part of DevOps is to work together with the same goal and a similar mentality. [2]

3 Reflection

3.1 Transitioning challenges

Trying to move to a more DevOps-focused workplace can be very challenging for companies that have not taken it into account from the beginning. Getting employees to create automated testing processes and continuous delivery is

probably something that can be considered part of one's job tasks, but getting people to change their opinions and attitudes is probably not as easy, or for that matter always reasonable to demand. If you as a company have already created clear core values before recruitment, as well as a vision of what culture you want to have in the workplace, it is probably easier to filter out candidates who you believe do not meet these requirements. For example, recruiters can ask appropriate questions to see how candidates reflect and then decide if it fits into the company's culture. But requiring employees to change their way of working and mentality after previously having no demands can make workers unmotivated and create the feeling that the work tasks do not match what they initially thought they would be. Especially if the transition means increased workload or time spent in meetings, for example. This may also be a reason for the difficulty of being able to create a DevOps-friendly culture.

3.2 Too much transparency

As previously described, a large part of creating a DevOps culture is about being very transparent about both one's way of working and sharing knowledge. The reason for this is that teams should understand each other's needs and have the opportunity to adapt to each other's needs to create better collaborations and efficiency. But in large companies with many employees, communication can be more challenging without creating a new workload on employees, which may be one reason why it is so difficult to strive for a DevOps culture. It may be good to try to scale down as much as possible of what is shared between teams to address only the most relevant to avoid wasting unnecessary time in meetings and non-rewarding conversations. Because the purpose of DevOps is to create effective and strong teams, it feels like too much transparency can create more harm than good in certain situations.

4 Conclusion

After understanding and reading about DevOps culture, it's clear that it can be very beneficial for a team. The transparency and blameless culture create an open environment to work in which can evolve within. The main conclusion and takeaway from this essay are that while the technical aspects of DevOps are important in the transition, the DevOps process cannot be achieved without considering the culture and letting the team evolve in their own time.

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