DevOps: The Mindset Change for All IT Organizations

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Abstract: **DevOps is a movement, culture shift and engineering discipline, buzzword consist of best practices and principles which our followed while delivering the software solutions to the Clients. Deploy our code quicker into production environment. DevOps is a well-trodden path, which is gaining momentum over the past few years. Considering ever-evolving routines, the year 2020 is becoming the year of interest for organizations looking out for DevOps improvements. DevOps has come up as a wave of new collaboration between different teams, leads to the creation of an end to end connection across organizational structures. DevOps is a seamless connection between the development and operational teams, which has enabled both sets of groups to work as a single unit as one united Team. This paper has introduction to DevOps, Body of the Paper has 5 sections which focuses on best practices and principles in DevOps section 1: Continuous Improvement section 2: Automations, section 3: Lean Principle and Rapid feedback section 4: Agile, Speed to market, Deliver Value to Client, Team Collaboration, section 5: DevSecOps. This is followed by Conclusion, acknowledgement, references and Biographies.**

Keywords: **DevOps, SDLC, Agile, Automation, Value to client, Speed to market.**

1. Introduction

As demands of software developers increase and IT is under pressure and IT companies are under pressure from the Business, customers and stakeholders, there was a need to work with different approach. We need to work more with more productivity and increase the quality of results and deliver value to our customers is important. DevOps is more about creating new era, establish industrialization. DevOps is enabler of Agile methodology. DevOps and Agile both go hand in hand. In the entire Software Development Life Cycle (SDLC), Agile helps to achieve speed to development and DevOps will help in speed to market. The software changes will move to the market faster and value will be generated for the clients.

DevOps is transforming how software companies work. Taking the performance to the next level for fortune 500 companies and www. DevOps is not any software tool, it not any new technology or methodology or any programming language. When we say DevOps, it's all about Development and Operations we are talking about. DevOps is a way of working in your Team, following certain Best practices and principles while delivering to software changes to the client. It's an Engineering Discipline you worship and follow religiously while working though out your SDLC. Discussing all best practices in below sections.

2. Continuous Improvement

In the journey of SDLC we emphasize to achieve continuous improvement, and so does continuous integration (CI), Continuous Deployment. In CICD workflow, we try to achieve Continuous Build, Continuous testing, and if or when ever required Continuous Deployment, thus implementing Continuous Delivery for the clients. Open source tools for CI like Jenkins is most widely used by many clients. License tools like Bamboo, Team city, Hudson etc. are also available to serve the same purpose.

3. Automations

Automation is the key in DevOps and lots of tools we use at different stages/phases of SDLC to improve the process of software delivery. We have many tools available in market for example: Jenkins as CI tool, Maven as Build tool, Junit for unit testing, Sonar for code quality, JMeter for performance, etc.… All environments creation, software application deployments, any environment configuration is also now automated via Infrastructure automation or we have trending concept as Infrastructure as Code. We can have everything as code too, even we can go Serverless. Tools like Chef, Puppet, Ansible, Saltstack, etc.…These tools are used for mutable or evolving type of infrastructure. For mutable type of infrastructure, we have Docker container, Kubernetes, Open Shift, Terraform etc. Anything manual we are doing for our environment set up, it can be automated. Using Cloud platform makes life easier along with DevOps and Agile.

4. Lean Principle and Rapid Feedback

DevOps Team follows Lean principle and requires fast feedback to speedy quality delivery. There are 7 Lean Principles - Eliminate Waste, Build Quality In, Create Knowledge, Defer Commitment, Deliver Fast, Respect People, and Optimize the Whole.

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5. Agile, Speed to market, Deliver Value to Client, Team Collaboration

Lean, Agile establishments emphasizes on the highest priority items first. Working iteratively, each Product Backlog is further divided into Epics->User stories->tasks, thus deliver in sprints, takes the feedback from all sources and deliver value to the client by quickly shipping the changes in the market. This is possible only with great collaboration between Dev and Ops Team together.

6. DevSecOps

Identify Security requirements in the beginning itself i.e. during requirement gathering phase itself of SDLC, it's called Shift Left or DevSecOps. As IT industry is becoming comfortable with DevOps culture, now we are focusing on security which is very important aspect for our client's reputation. Hence DevSecOps is emerging now. We have automated security tools. Example: for Static Application Security Testing (SAST), we have tools like Dependency Check and for run time applications, we have Dynamic Application Security Testing (DAST), tools like ZAP (Zed Attack Proxy), HP Fortify WebInspect are tools available for the same. Security is everyone's responsibility DevSecOps focuses and it should automate by using tools mentioned above.

Fig. 1. Example: Stages for DevOps process

Fig. 2. DevOps in action

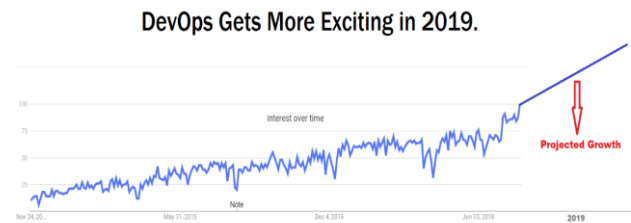DevOps progress in below graph till 2019 across organization.

Fig. 3. DevOps gets more excited in 2019

7. Conclusion

DevOps creates consistency with each release by ensuring environment have synergy. DevOps creates an integrated development and deployment team. DevOps is improving with each year, and there is a lot of emphasis being laid on the improvements of processes, which can make the operation of the DevOps even more effective and useful. The concept is no longer new; initiation and carrying forward is what needs to be taken into consideration, to ensure everything is working smoothly as a well-oiled machine Fig. 1, show cases the entire process of DevOps. Fig. 2 shows DevOps in Action and DevOps progress graph.

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