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Changing Roles of IT Service Management with Cloud Computing & DevOps

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ABSTRACT: Cloud computing is a powerful technology that provides Software as a Service (SaaS), Infrastructure as a Service (IaaS) and Platform as a Service (PaaS). So it provides storage, data centre, software, hardware, infrastructure and application which all are on demand, anytime and anywhere with low-cost. Platform as a Services (PaaS) enable developers to automate the application build and development process within a secure, enterprise grade application infrastructure all in the cloud. Development and Operations (DevOps) is a productive way to develop software in high quality code and delivered more quickly. The combination of Cloud computing and DevOps services simplify provisioning and managing infrastructure, deploying application code, automating software release processes, fast application development and monitoring your application and infrastructure performance. Adopting both, organizations are not only virtually built application in any programming language with any programming tools but also deploy and run application quickly and reliably on any infrastructure. [1] The implementation or transition, to a DevOps development process (the integration of both development, operational teams and processes), has proven itself as an enabler to reducing time to release, improved automation of repetitive processes and a key component of agile development and release. While agile development has led to the increased focus and development of the DevOps model, DevOps is not an all-or nothing change. DevOps can (and should), be introduced and implemented in traditional development environments where appropriate and the improvement can be measured. [2]

KEYWORDS: ISTSM, Cloud computing, DevOps

I.INTRODUCTION

ITSM is increasingly viewed as a dynamic centre for expanding IT value, impact, and effectiveness in support of broader business requirements in combination with operations, development, and business stakeholders. [3] IT service management is more needed than ever as IT seeks to become a truly service-aware, business-aligned, enterprise facing organization. ITSM is a process-based practice designed to align the delivery of information technology services with the needs of the enterprise and IT customers. Many ITSM descriptions rely heavily on IT Infrastructure Library (ITIL) roots for ITSM, as well as other best practices focused on process. DevOps is an organizational approach that stresses empathy and cross-functional collaboration within and between teams – especially development and IT operations – in software development organizations, in order to operate resilient systems and accelerate delivery of changes. DevOps has also been called a “stub for more global company collaboration” [4]. The goal of DevOps has been defined as that of reducing the time between development and operation of software without negatively affecting quality. [4] Cloud computing is a new business and IT operating model for delivering real-time or near-real-time information and access to services. Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.[5] The combination of Cloud computing and DevOps services simplify provisioning and managing infrastructure, deploying application code, automating software release processes, fast application development and monitoring your application and infrastructure performance.[6]

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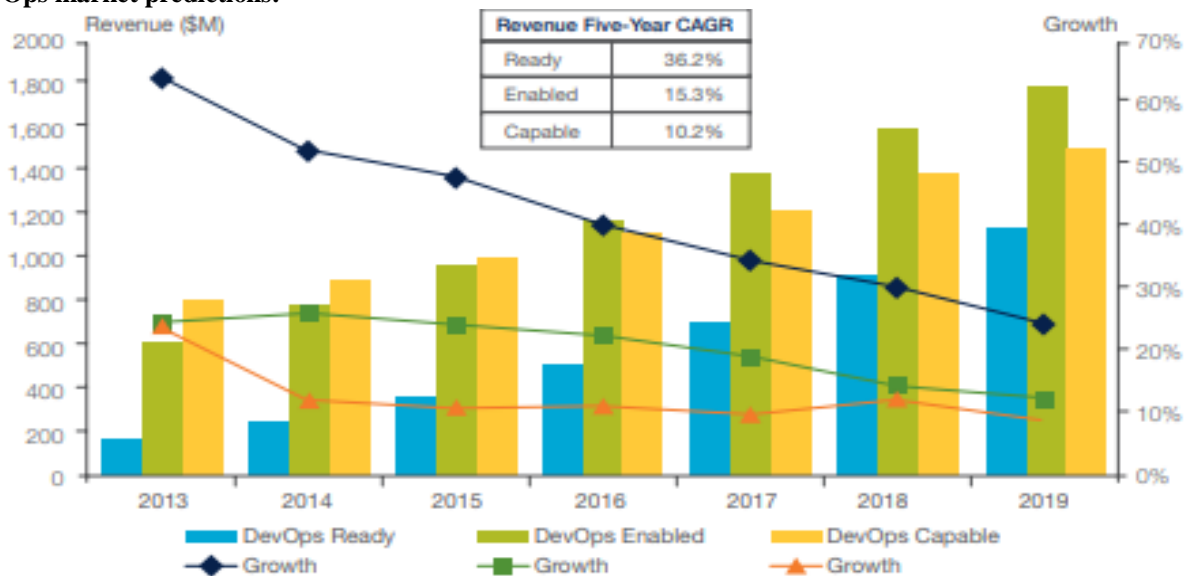
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II.METHODOLOGY

DevOps: DevOps has fundamentally changed the way an IT organization works and how it gets things done. Since its inception in 2009, DevOps (coined as the “new Cloud” by market) has been adopted at a rapid pace, evolving from a niche concept to an integral part of enterprise IT strategy. This fast pace in adoption was mainly due to the immediate value realization that DevOps helps business to build better-quality products and services quickly and with greater reliability.

DevOps market predictions:



Fig(a). predicts that the DevOps market is set to grow from \$1.9bn in 2014 to \$2.1bn in 2015, showing a very healthy growth of ~11%.[7]

In addition to this, DevOps market movement has been catalysed by increased Cloud adoption, emergence of concepts like containerization, Platform-as-a-Service, micro-service architecture, service virtualization, and a strong contribution from the open-source community with several cost-optimized DevOps enabling tools. The early adopters or the “DevOps Unicorns” like Netflix, Amazon, Google, Etsy, and Snapchat have continuously innovated and showcased successful DevOps model variants like NoOps, ChatOps, and SmartOps. In a recent study, Rackspace4 interviewed 700 IT decision makers and found 55% of the organizations had already implemented or adopted DevOps and are looking for enhancements. Further 31% of them plan to use DevOps in the next 2 years. This adoption is among the largest in the side of technology for the initial implementation of tools. [6]



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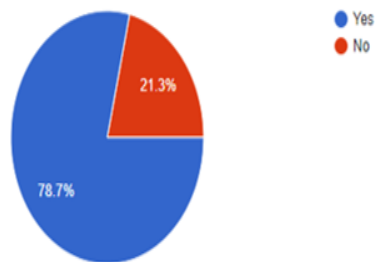
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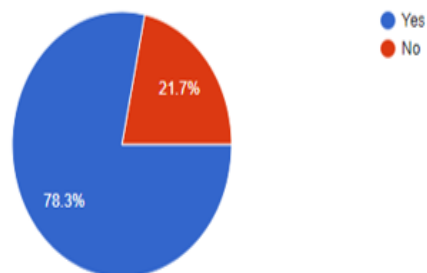
Organizations Incorporating DevOps:

47 responses



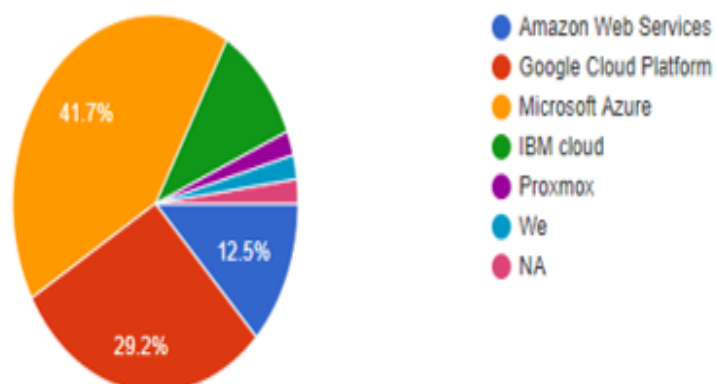
Organization Incorporating Cloud Services:

60 responses



Cloud Platforms or Services Used in Various Organizations:

48 responses





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CHANGING ROLES:

Organizations are introducing agile and lean software development techniques in operations to increase the pace of their software development process and to improve the quality of their software. They use the term DevOps, a portmanteau of development and operations, as an umbrella term to describe their efforts.

Survey Results:

We started our research by doing a Systematic Review which describes the quality of the studies, gives a short summary and relates to the research question it contributes to. We figure some seven top labels:

- Culture of collaboration:** The culture within an organization.
Organizations practicing DevOps *try to remove the cultural barrier between development and operations personnel.*
- Automation:** Automation within the software process.
Organizations practicing DevOps *aim for a high degree of automation.*
- Measurement Metrics:** Measurement Metrics within the software process.
Organizations practicing DevOps *try to use metrics involving both development and operations disciplines, instead of separate metrics for both.*
- Sharing:** Sharing of information within the software process.
Organizations practicing DevOps *try to facilitate between development and operations, by having shared systems for recording knowledge.*
- Services:** Structuring the organization around services instead of around disciplines.
Organizations practicing DevOps *for example use cloud services and the microservices architecture.*
- Quality Assurance:** The party involved with ensuring products and services have adequate quality.
Organizations practicing DevOps *sometimes try to incorporate QA into the software process.*
- Governance:** This label refers to the way in which organizations practicing DevOps are governed. One relevant issue is the integration of DevOps with standards such as ITIL.[4]

Organizations Implementing DevOps:

To describe the implementation of DevOps we considered on case study which was done at FinCom: The interviewee at FinCom stated that DevOps as the formalization of the Agile concept that a team is responsible for every aspect of a product, which includes operations. FinCom is one of the first large organizations which started to implement DevOps in The Netherlands and had been using it for a few years at the time of the interview. FinCom has been mentioned by various other interviewees (e.g. at FinCom2 and SupportCom) as a source of inspiration for their own adoption of DevOps. The interviewee had participated in the DevOps adoption from the start. The interview is summarized in below Table I.

Code	FinCom1:
DevOps	Defines DevOps as the formalization of the Agile concept that a team is responsible for every aspect of a product, which includes operations.
Individual	Uses the title DevOps Engineer for all development and operations personnel working in DevOps Teams.
Team	Uses DevOps Teams who are responsible for both developing and operating systems and services.
Department	Merged departments of development and operations into DevOps Departments.
Culture of collaboration	Has development and operations personnel working together daily. The organization is exploring how infrastructure personnel can work in DevOps Teams. A DevOps Team shares responsibilities towards delivering new features and functionalities in a stable manner.
Automation	Automates the process of releasing software through automated tests and is implementing Continuous Delivery.
Measurement	Measure effectiveness of systems and teams using an inspect-and-adapt-loop. Measures the time between inception of an idea and the idea actually being available as a service to customers. Has made usage by and satisfaction of customers the primary measure of system performance.
Monitoring	Has operations personnel monitoring systems while being in close contact with the users, so they can correlate problems reported by users with changes in the system conditions reported by the monitoring instruments.
Lean	Applies lean principles to improve both the effectiveness and efficiency of processes, but only considers lean to be weakly related to DevOps.
Sharing	Encourages employees to speak their minds regarding process and product improvements, and uses openness as one measure of employee performance.
(Micro)services	Sees DevOps as a way of organizing processes, separate from architecture.

Table I. Summary for DevOps at FinCom[4]



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1. Why did FinCom decide to implement DevOps?

FinCom had three main goals that they wanted to achieve by implementing DevOps: *Reduce lead-time, improve problem solving and improve feedback.* Starting new projects took a very long time at the organization, as teams had problems obtaining development resources such as servers and software. During the project itself, it was hard to solve problems in which close collaboration between development and operations personnel was needed. By using DevOps, FinCom wanted to decrease the time required to solve these problems. The organization also wanted to increase the knowledge available to development personnel regarding customer satisfaction. Before adopting DevOps, information about customer satisfaction was collected by operations personnel, but seldom shared with development personnel.

2. How did FinCom implement DevOps?

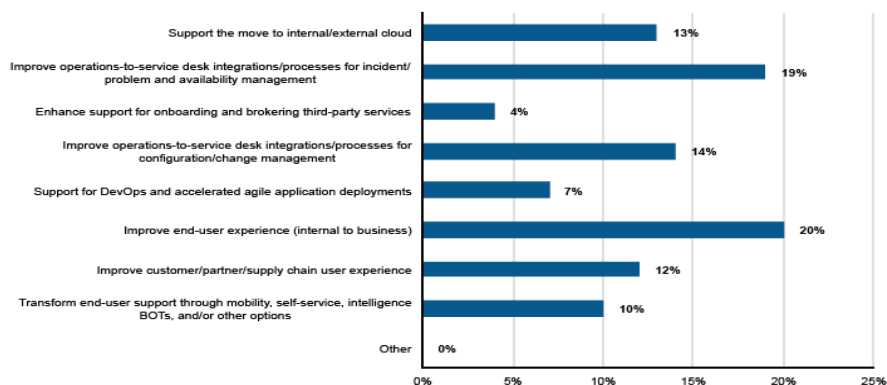
FinCom adopted Scrum, ITIL and CMMI before adopting DevOps. FinCom introduced DevOps Teams, in which development and operations personnel work together on a daily basis. At the same time, the organization introduced a new employee role called DevOps Engineer. Employees having this role should have skills in both development and operations. Eventually the organization wanted to employ only DevOps Engineers. [4]

3. What results did FinCom expect to achieve by implementing DevOps and how far have these results been achieved?

FinCom reported an improvement in the lead time of projects. Before adopting DevOps there was no process for starting new projects. Because of this it took a long time for projects to get the required infrastructure for development and operations. By introducing an automated process for this, the lead time was reduced from roughly nine months to nine weeks. The interviewee also reported an increase in software quality. [4]

Future of IT Service Management

Strategic management priorities for ITSM centered on improved end-user experience and integrated operations for incident, problem, and change management. This data is very similar to data collected in previous years, suggesting a longer-term need for integrated service desk and operations management capabilities. [3]



Fig(a). Future of ITSM[3]

The top functional priorities for ITSM were the following:

1. Improved project management and improved automation for self-service (tied)
2. New or enhanced CMDB/CMS or ADDM support
3. Service catalog for self-service and cloud
4. Cross-domain IT asset management and optimization
5. Mobile support for IT stakeholders.

Significantly, 55% of respondents viewed big data analytics for IT as a shared priority for ITSM and operations. Twenty-two percent viewed it as primarily an operations concern, and 14% viewed it as more of an ITSM priority. Only 9% hadn't thought about the topic sufficiently to comment. The most prevalent requirements for ITSM analytics were support for IT-to-business and ITSM-to-operations decision making. [3]

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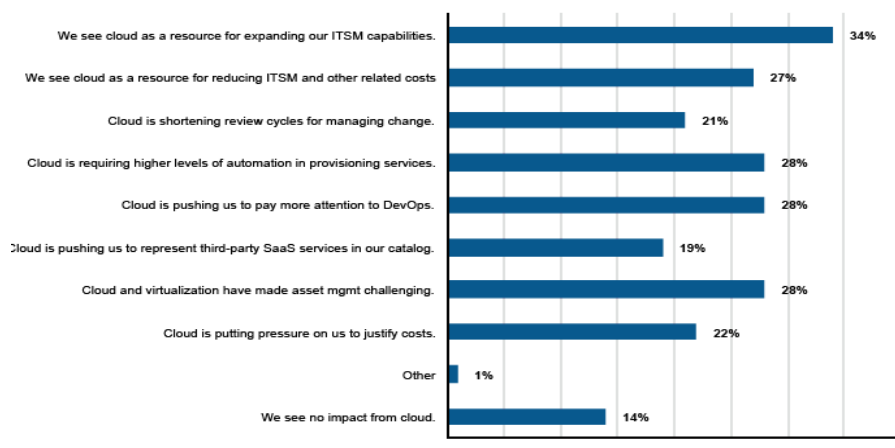
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Impact of Cloud on IT Service Management:

Our respondents viewed cloud both as an opportunity for expanded functionality and as a challenge. The leading impacts, as seen in Figure 3, were viewing cloud *as a resource for expanding service desk capabilities* while also requiring higher levels of automation, driving more attention to DevOps, and making asset management more challenging. Significantly, only 14% saw “no impact from cloud” as compared to 21% in 2013. In parallel, the number of respondents who saw cloud as a resource for expanding service-desk impact and functionality rose from 25% to 34% in two years.



Fig(b). Impact of Cloud on ITSM[3]

Cloud has become even more of a catalyst for ITSM transformation over the last two years, with 34% of respondents currently (versus 25% previously) viewing cloud as a resource for expanding service desk capabilities, and only 14% (versus a previous 21%) seeing “no impact from cloud.”

Integrated support for agile and DevOps has also grown significantly over the last two years. When asked if integrated release management for new application services had been integrated into ITSM capabilities, 65% of respondents said “yes,” of whom 34% indicated that integrated release management had been available for more than a year. This figure of 65% contrasts with only 39% who claimed some support for integrated release management just two years ago! Moreover, in our current research, an additional 16% claimed to have imminent plans for integrated release management. [3]

Impact Of DevOps on IT Service Management:

How ITSM and DevOps are coming together, with a focus on scheduling, workflow, feedback loops, and pre-production provisioning via a CMDB/CMS. In fact, recent dialogs with CMDB deployments included one development team leveraging a CMDB using Scrum and pushing the modeling out into a less mature (more siloed) operations organization. Moreover, 55% of respondents viewed integrated ITSM and DevOps as “very positive” or “transformative,” while only 1% viewed it negatively.

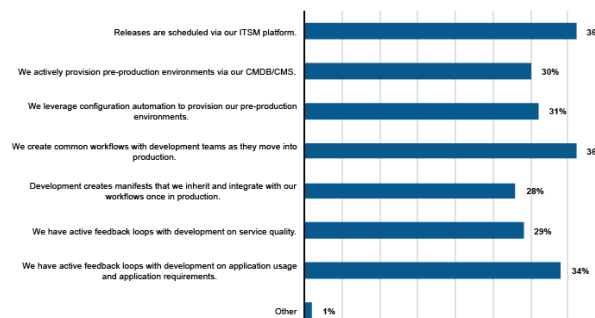


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Fig(c). Impact Of DevOps on ITSM[3]

are among the most popular reasons that ITSM and agile are coming together with increasing benefits to Scheduling, workflow, feedback loops on application usage, and pre-production CMDB/CMS enablement IT as a whole.[3]

III.CONCLUSION

Today, the DevOps and cloud computing trend not only goes beyond technology implementation and management but also focuses on a positive organizational change brought across its processes, cultural shift, and security and compliance aspects of the DevOps and Cloud platform. Over the next 5 years, the DevOps and Cloud market looks very positive, with many sources forecasting double-digit growth and a higher adoption rate as larger enterprises begin to understand the benefits DevOps can bring in terms of cost reduction and agility.

IV.ACKNOWLEDGEMENT

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BIOGRAPHY

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