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AN EXPLORATORY STUDY OF DEVOPS & IT'S FUTURE IN USA

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ABSTRACT

Software development is a holistic and engaging platform that involves multiple players and stakeholders. The development of the right software solutions depends on factors like the ability to maintain communication and collaboration with the developers. Secondly, using a reliable framework has been associated with shortening the development process while improving the resulting solutions exhibit's overall performance and cost-effectiveness. The traditional frameworks for software development have weaknesses like lengthy procedures which undermine their overall effectiveness. Further, these processes end up being ineffective, exposing the resulting applications to various forms of attacks and weaknesses. Therefore, focusing on the DevOps framework offers the ideal framework for improving application development security and reliability. The United States` IT industry has not yet fully adopted this framework making it hard to achieve the ideal goals. Therefore, the United States will benefit from this framework by incorporating it into the underlying new technologies like artificial intelligence to produce a reliable framework for promoting operational efficiency and software security.

INTRODUCTION

Over the years, software solutions have helped many companies around the globe tap into the benefits offered through the latest technologies. The development of new companies has been primarily influenced by the advancements witnessed within the technological fields of interest. One of the most common goals that have informed numerous companies in the United States and across the globe is the speed of operations and service delivery to consumers (Toh, Sahibuddin & Mahrin, 2019). Maintaining a positive relationship with the consumers has been considered one of the most common factors influencing managerial and organizational decisions made within the course of operations. Failing to maintain a positive relationship with the consumers reduces the abilities to promote operational excellence and efficiency across the market. On the same note, it is worth noting that considering the consumer needs in the corporate setting sets a platform for boosting operational excellence and competitiveness over rival firms. However, one of the challenges that have been witnessed in the recent past concerning the delivery of consumer services in the various markets is the lack of a proper definition associated with maintaining operational efficiency throughout operations. Sometimes, firms have found it challenging to gather the right evidence to support their core operations within the underlying markets (Saltz & Sutherland, 2020). DevOps is one of the concepts associated with organizational success in implementing information technology solutions. DevOps offers a framework for improving operational efficiency and insight into the organizational needs by bridging the gap between the development processes and organizational operations hence promoting faster deployment and automated IT implementation (Hart & Burke, 2020).

While technology offers a framework that boosts operational efficiency and excellence, it is worth noting that non-software development entities have found it difficult to ensure smooth work coordination and reduce their overall performance. In this context, understanding the software and hardware requirements is essential for the respective firms because it helps improve the overall performance, which is witnessed in the course of operations.

Technology is one of the most common inventions that has offered a chance for boosting daily corporate operations, companies that implement the right technologies stand at a better chance of promoting their daily operations while at the same time ensuring competitiveness in the industry and markets. One of the most common solutions offered through technology is DevOps. DevOps is a relatively new concept and principle introduced in the computing environments aimed at boosting the overall organizational performance and abilities to meet the growing needs witnessed in the industries and markets. With increased concern for the development of efficient software solutions, companies are connected to various inventions (Senapathi, Buchan & Osman, 2018). However, not all companies have managed to achieve operational efficiency. With

DevOps, companies can bridge the existing gaps, which have made it hard to achieve the ideal goals in performance.

PROBLEM

The most common challenge that has been witnessed in the computing and organizational field is bridging the gap between the continuous development tasks and the operations executed within an organizational boundary. This gap has affected the abilities to ensure continuity in business operations executed within a given environment or workplace. Ensuring business continuity through disaster recovery is not sufficient to allow a firm to promote efficiency. Therefore, numerous other interventions have been made over the years, which would promote operational efficiency. Such interventions reflect on using solutions that bridge the gap between the development process and the operational activities executed within a given environment.

This statement implies that while various disaster recovery and emergency response measures are implemented within an organization to counter software or hardware failures, they are not sufficient since they do not bridge the gap between the development and operations. DevOps essentially involves dealing with the uncertainties that may be witnessed when a firm intends to utilize a set of software solutions to promote its daily operations. DevOps has been developed to create a framework for promoting continuity in business from multiple dimensions. Some of the most common dimensions addressed through DevOps include continuous development, deployment, delivery and integration of new IT systems and solutions within an organizational boundary.

DevOps' primary principles all focus on the elements of continuity in the delivery of solutions from an information technology dimension to ensure maximum operational efficiency. Understanding the best practices that should follow when it comes to product and software delivery within an organization is essential for the major stakeholders. Ensuring a smooth transition from one state to the next within an information technology field is essential since it reduces the uncertainties associated with such tasks. On the same note, it is worth noting that the development of the right interventions makes it easy to successfully implement information technologies solutions within an organization, hence promoting operational efficiency.

It is worth noting that the concepts associated with DevOps can be deployed and replicated in other fields as opposed to just the information technology and software development areas. This replication can help firms to promote operational efficiency and excellence while at the same time ensuring maximum returns (Faustino, 2018). Therefore, it is worth noting that DevOps is an integral part and framework that can be replicated in diverse areas to promote operational efficiency hence achieving the ideal goals within an information system dimension. However, numerous firms that intend to promote operational efficiency have found it hard to promote their goals through the prevailing challenges or lack of insight into DevOps principles' benefits.

Numerous firms do not understand the capacity and the potential benefits that DevOps may offer their operations based on the reduced connection with the underlying principles. While the DevOps concept has been offered in various environments, the lack of a concise definition and understanding from firms has made it hard to promote operational efficiency and excellence. Therefore, through the analysis of the understanding that many companies exhibit in connection with DevOps principles, it is worth looking at the underlying practices that will promote operational efficiency and allow firms to exploit the elements associated with continuity to achieve the ideal goals (Gupta, Kapur & Kumar, 2017).

Through these ideas, it is easy for firms to promote their operations while improving insight into continuity in the future. This project offers an understanding of the diverse DevOps principles outlining some of the most common factors that promote operational efficiency and excellence. Through analyzing the weaknesses that the traditional software development and deployment practices have offered, DevOps offers a new approach for improving operational efficiency. This framework is supported by numerous tools and solutions that focus on automating the development and deployment processes within a given environment. Understanding the role played by the automation practices is essential since it promotes operational efficiency within the various firms.

DevOps essentially can be seen as a set of practices and tools designed to shorten and smoothen the traditional software development and deployment process. These principles reduce the software development process by

a significant fraction based primarily on the elimination of the potential cases of redundancy during the design and implementation processes. Further, this approach differs mainly from some of the traditional software development models like the waterfall framework because the former focuses on rapid deployment and implementation of solutions. A majority of the traditional frameworks have focused mainly on using a redundant process that is not cost-effective in the process. Further, the traditional software development model and deployment do not integrate security in the various stages, making it hard to create and implement the ideal solutions that best meet the client demands.

This framework has offered the ideal approach for handling continuity in business operations by shortening the software development and deployment process. On the same note, this framework promotes operational efficiency by providing a reliable approach for coordinating activities within the software development and implementation processes. Understanding the benefits associated with the development of a software solution using DevOps is essential because it reduces the costs associated with the inconsistencies associated with the traditional approaches. On the same note, a firm that utilizes this framework has offered the ideal platform for achieving better returns which relate to the overall operational efficiency achieved within the course of execution.

Therefore, understanding the overall benefits that DevOps offers to the organizational, operational dimension allows a given firm to improve its abilities to meet their daily tasks and hence success. On the same note, it is worth noting that a firm's operational success can be affected by numerous factors that relate to the speed, efficiency, and reliability of the resulting solutions. When a firm is informed by a framework that promotes faster and continuous connection with the development and deployment practices, it fosters operational efficiency and excellence. Through such an understanding, organizations today can benefit from using a new approach for managing development and execution associated with software and other information technology solutions. Therefore, when addressing DevOps's concepts, it is worth looking at the perceived benefits which it may offer to the country as a whole (Luz, Pinto & Bonifácio, 2019). Probably, one of the main benefits achieved from a national dimension is the abilities of firms to promote operational efficiency, which translates into increased output and reduced production costs. Such a trend is essential since companies can maximize their overall outputs while at the same time boosting the country's economic progression and hence success (Erich, Amrit & Daneva, 2017).

LITERATURE REVIEW

From the information given above, numerous issues have been witnessed relating to DevOps' adoption and implementation in the organizational setting. In an attempt to understand the role and benefits associated with DevOps in the country, it is essential to first look at its basic history. One of the issues that have been identified and associated with the implementation of the framework is that the DevOps approach is informed by the already existing solutions like lean and the Plan Do Check Act methodologies. These methodologies have offered the ideal framework for improving operational efficiency and the performance associated with software and organizational units.

Further, it is argued that the framework has been associated with the concepts such as Just in Time delivery of material and solutions like used in the case of Toyota. The firm has maintained numerous practices which have focused more on delivering material and products according to the growing consumer needs. The development of ideal solutions focused more on ensuring operational efficiency has enabled many organizations to foster success with the increased connection with the underlying market demands and trends (Chen, 2018). The DevOps concepts are informed by the traditional systems' weaknesses and opportunities in software development and deployment.

For example, while lean and just in time frameworks offer a chance for reducing wastes and improving efficiency, they fail to account for faster delivery and deployment of solutions according to the consumer needs. This model, however, focuses on the elements of speed in the delivery and deployment processes while accounting for the associated factors like operational efficiency. On the same note, these models have failed to account for the continuity and progressive nature of software solutions deployment within the organizational setting (Laukkarinen, Kuusinen & Mikkonen, 2017).

On the same note, it is worth noting that the inclusion of strengths associated with the traditional models is essential since it fosters awareness into issues like continuity and progressive deployment of software solutions according to the underlying organizational needs and demands (Laukkarinen, Kuusinen & Mikkonen, 2017). It is worth noting that the success associated with this model is based on the determination of the weaknesses associated with the top-down frameworks. As a bottom-up framework, this approach has allowed developers and experts in the software design and deployment fields to come up with flexible approaches for ensuring continuity in the deployment and delivery of solutions according to the prevailing organizational needs and demands. Therefore, understanding the primary challenges that continue to influence the overall organizational success, it is worth noting that DevOps offers a reliable bottom-up approach for handling software development and deployment and hence promoting operational efficiency and reliability.

The first conference, which focused on promoting DevOps, was held in 2009 in Belgium and was named DevOps day. This meeting was founded and chaired by Patrick Debois, a project manager and an agile expert. This conference has now been adopted in various areas across the globe, offering the ideal platform for promoting the software development and deployment of organizational needs. The conference has gained traction around the globe, focusing on improving software development practices and achieving the desired goals in performance, reliability, and resilience of the resulting solutions.

The positive reception that DevOps has received over the years has attracted the attention of multiple stakeholders in the industry hence ensuring maximum operational efficiency and reliability of the associated solutions. This model's replication in various organizational settings has been informed mostly by the benefits offered to the consumers and the end-users. While the traditional frameworks offered a chance for developers to use incremental approaches, it is worth noting that the organizational success associated with using the DevOps concepts ad principles has been informed by additional connection to security and awareness of the overall corporate operations (Fox, 2020).

After looking at a sample history associated with DevOps, it is worth looking at the core building blocks associated with the adoption of the DevOps framework. These blocks play a crucial role in defining the ultimate framework for approaching the development and execution processes in software development. For example, DevOps' primary building blocks reflect on diverse frameworks that inform the software development and execution processes. These principles and blocks all define the continuity attributes of software development and execution.

The continuity aspects of a given software can help improve the overall performance achieved within a given area and instance. Understanding the role played by reducing the gaps between concept design and implementation of the underlying solution makes it easy to develop reliable solutions that best capture organizational needs and demands while boosting operational efficiency. Some of the most common building blocks associated with this framework include team management, automation in implementation and feedback collection, progressive organizational learning and but not limited to the security aspects of the software development processes. These concepts play a crucial role in defining the ultimate approach for handling the progressive challenges that influence organizational behavior while boosting operational efficiency and reliability.

This concept is based on the idea that software development and deployment processes usually require the interactions and engagement of various teams which work collaboratively to deliver a common goal. Understanding team management and coordination in the software development process requires the adoption of the ideal framework for promoting operational efficiency. DevOps usually involves overcoming some of the major bottlenecks associated with a given team when considering the transition between the development processes and any organization’s operational aspect. Historically, the development process involves multiple players and teams. However, managing these teams has been a significant challenge affecting the overall success associated with the overall organizational operations.

Further, big teams involved in software development and deployment have made it hard to smoothen the implementation process's overall operations. The lengthy processes used in fostering communication have made it hard to ensure maximum collaboration between the various developing teams while considering the role played by collaboration in shortening the process while at the same time ensuring maximum efficiency

in software delivery and deployment (Kuusinen & Albertsen, 2019). DevOps helps in shortening the length of the process involved in the execution of the underlying software solutions. On the same note, it is worth noting that the reduction of the lead time has allowed firms to improve operational efficiency when developing and deploying software solutions. Improving expertise is essential for promoting team capacities and the ability to meet the rising challenges affecting the overall organizational success in shortening the development and deployment time.

AUTOMATION OF THE DEVELOPMENT AND DEPLOYMENT PROCESS

One of the areas that DevOps has focused on is collecting and analysing the feedback offered by clients and organizations. Feedback collection plays a crucial role in that it allows the underlying firms to promote the overall performance achieved in the process through collaboration. Many firms have failed to promote efficiency in operations based on the inability to collect timely feedback from the clients and users according to their relationships with the underlying systems. Through the automation of the feedback collection and analysis process, the underlying organizations can meet their daily tasks and goals when it comes to promoting operational success and efficiency. Numerous firms have failed to accomplish their intended goals because of poor connection with consumer feedback and perceptions. Understanding clients' perceptions of the underlying systems are essential for decision-making within the corporate setting.

Further, when considering the issues affecting the overall operations executed within the organizational environment, it is worth noting that gathering immediate and timely feedback from the clients allows a firm to promote its overall operations while at the same time boosting overall development goals. The success associated with incorporating feedback onto the operations executed within the corporate systems depends largely on the determination of the clients ’needs and changes in demands. This approach makes it easy for a firm to promote immediate inclusion of the proposed changes while fostering speedy testing of the resulting solutions to meet the desired goals. In this context, understanding the factors associated with the development of the ultimate framework for promoting efficiency in the system development processes calls for the adoption of the ideal framework for incorporating feedback to the underlying solutions. Incorporating feedback into the development processes makes it easy for developers to foster rapid testing and deployment of reliable solutions that best capture the client's needs and demands. Therefore, incorporating feedback within the required timeframes makes it easy to achieve the intended goals as far as the creation of the ideal framework for achieving better results in software development and deployment is concerned.

ORGANIZATIONAL PROGRESSIVE LEARNING

Organizational learning is an essential part of every firm. Developing measures that promote organizational learning is necessary because it helps in the promotion of overall health outcomes. In this context, the organisation's primary focus through the DevOps concepts is to promote insight and connection with the underlying solutions' development and deployment processes. This statement implies that an organisation's success in the deployment of the respective solutions depends on the identification and documentation of the primary challenges that may arise in the course of operations. The ability to identify problems before they occur helps organizations promote their respective employees' success and operations. For example, engaging the developers and the employees in a common platform informed by the DevOps principles helps bridge the gap between the development and the operations of the underlying systems. This goal is essential, especially for the information technology department, because it equips it with the right resources related to the software development and execution processes. In this context, the main focus is on the creation of the ideal platform for improving the overall success achieved with the design and implementation of the underlying systems.

Understanding organizational needs and structures when it comes to developing and deploying the underlying software solutions enables firms to promote risk management and mitigation. This statement implies that with increasing awareness about software development and execution, it is essential for any organization to consider the influences brought about by the unforeseen events that may arise during the development and implementation processes associated with the underlying software solutions. Using the right interventions may make the ultimate framework for achieving the ideal goals in connection with the clients` needs and demands.

ORGANIZATIONAL SOLUTION SECURITY

The last building block that this project looks at is the element of security. Organizational security remains one of the most common factors that influence the overall operations executed by a given firm when it comes to dealing with the client's needs and demands. Security of the underlying solutions has been a major issue of concern for many organizations across the globe. This trend has affected the ability to maintain the ideal levels of reliability that the respective software solutions exhibit. The traditional frameworks' failure to provide the ideal security has undermined their reliability in various application areas.

Therefore, DevOps offers a different approach to handling the reliability features and demands associated with each solution. This statement implies that the development and execution processes require adopting the right interventions that concern the security attributes needed to meet organizational needs. DevOps creates a framework that promotes the integration of various security measures since the developers can oversee the daily operations executed through the clients' constant feedback. Using this framework, it is easy for organizations to promote and uphold systems security using a layered approach.

One of the aspects which promote DevOps security capacity is the verification of code and other building blocks required to create a given software solution. Using the right interventions such as constant review and analysis, the developers can develop a high-level overview of the security that the code and the respective building blocks exhibit in relation to the projected solution. The resulting solution must meet a security dimension's underlying needs (Gupta, Venkatachalapathy & Jeberla, 2019).

FINDINGS

Numerous factors have been witnessed in this context, reflecting on the DevOps principles during the development, deployment and implementation of the underlying software solutions. One of the main issues that have been witnessed in the course of operations is that the adoption of DevOps has been low in various organizations. Many organizations still do not understand the implications of switching and adopting the DevOps principles to create and develop the overall and respective software solutions. Understanding the implications associated with the software deployment processes using DevOps is essential for the management teams since it promotes the organizational performance goals achieved in the long run.

While the management is concerned with cutting costs during the development and deployment processes, it is worth noting that the failure to account for the potential role played by shortening the entire process is equally significant in saving costs and time. From a general dimension, the DevOps concepts' adoption plays a crucial part in organizational success, especially when looking at the overall development and deployment of the respective software solutions, hence promoting operational excellence (Düllmann, Paule & van Hoorn, 2018).

However, one of the main challenges that companies continue to face today is the reduced insight into software development and deployment performance. This area is essential since it promotes the overall insight the companies' exhibit when it comes to managing the development and deployment processes. Ensuring security has been a major drawback affecting overall corporate performance and operations (Hsu, 2018). The literature above also shows that numerous companies have failed to consider the potential role of the continued connection with the major teams involved in the development and deployment processes, which has increased the time taken to implement the underlying systems.

However, DevOps offers a platform that promotes firms' overall performance when it comes to managing continuity in business operations. DevOps allows the developers to create and implement systems progressively hence reducing the risks associated with poor performance. On the same note, it is worth mentioning that in the country, adopting these frameworks will promote the overall performance achieved in the process hence reducing the risks associated with poor performance. Therefore, the primary outcome achieved through the literature is that there is a gap in the software development and implementation processes adopted by various companies around the globe when considering the influence of progressive deployment and the overall management of the underlying problems such as security and reliability. DevOps can be used to reduce the challenges encountered by companies during the deployment processes by bridging the gap between the developers and the users.

FUTURE IN UNITED STATES

In the United States, numerous companies have failed to adopt the concepts offered through DevOps. These frameworks have offered the ideal framework, which reduces the operational costs associated with the overall tasks executed within a firm during the development and implementation processes. The IT industry in the country has been on the rise for years. New inventions, like artificial intelligence, have offered a different approach to handling software development and deployment. The increasing demand for software to support the internet of things has offered the developers a chance to explore the current challenges that continue to affect the general working of the various firms responsible for creating and implementing such solutions (Kuusinen et al., 2018). With the promises offered through artificial intelligence, the IT industry can focus more on developing and executing the associated tasks based on the overall demands from a security and resilience dimension. Regardless, the chart below shows that the software development approaches using the DevOps framework have been adopted and continue to positively influence the overall organizational success in dealing with the security and reliability of resulting solutions.

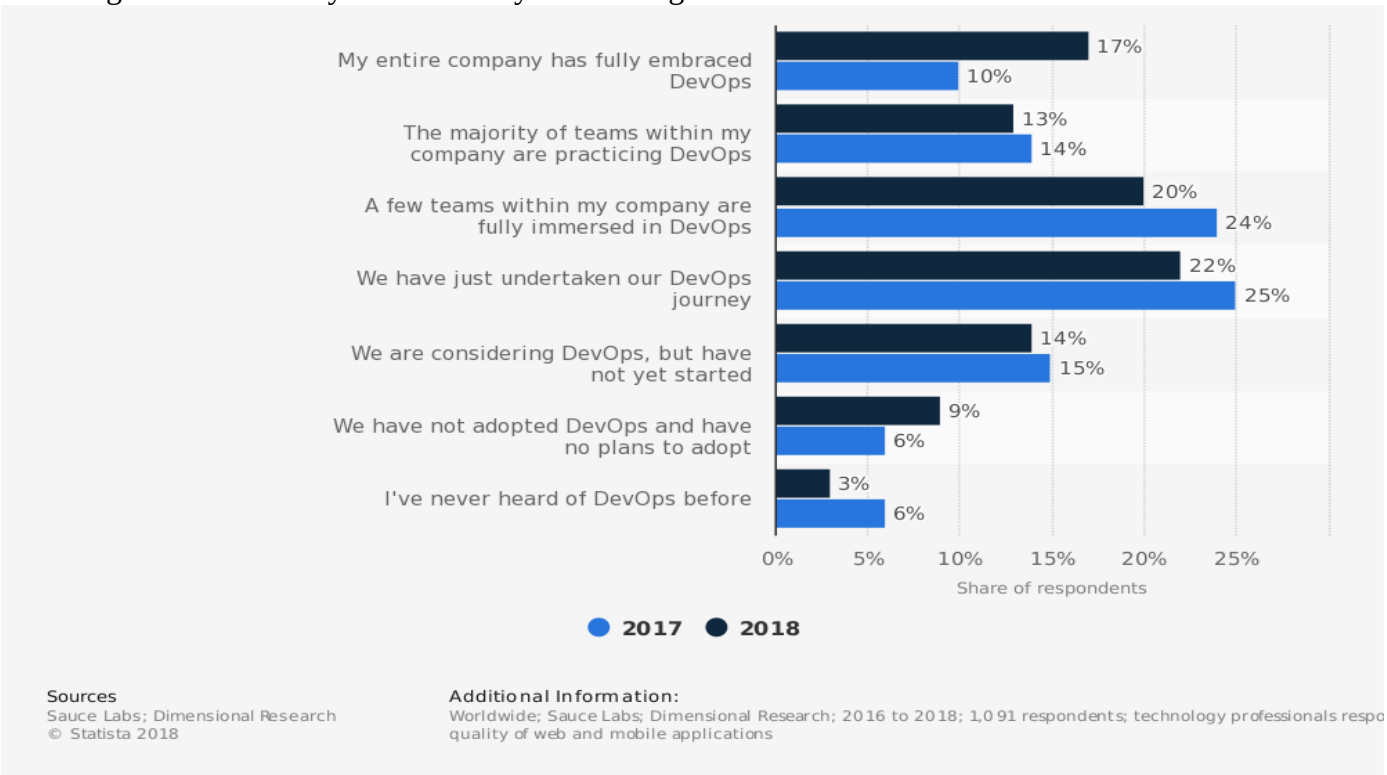

Figure 1. The progressive adoption of DevOps in the IT industry (Liu, 2019).

While artificial intelligence has been implemented in diverse areas in the software development fields, automation will significantly impact the approaches used to deal with the client needs. On the same note, it is worth noting that the developers' perceptions mainly influence the development of the ideal platform for promoting operational excellence associated with a firm. Developers should focus on creating a solution that aligns with the growing performance and security demands.

One of the promises that the current developments offer in the US market is that applications and software solutions will be automatically designed, coded and implemented to reduce the overall lifecycle time. The automation of the development process will call for using a framework that suits the speed and hence effectiveness associated with the resulting framework. This statement implies that the development of the respective solution calls for the creation of the ideal platform that will promote automation and foster the currently witnessed inventions. Additionally, developers will need to address the challenges presented through automation and reduced insight into the overall application security. The reduction of insight into the core functionalities and building blocks associated with each application will undermine the long run's overall performance. As the figure below shows, software solutions following the DevOps framework require extensive planning and continuous feedback collection to foster improvements in the resulting solutions.

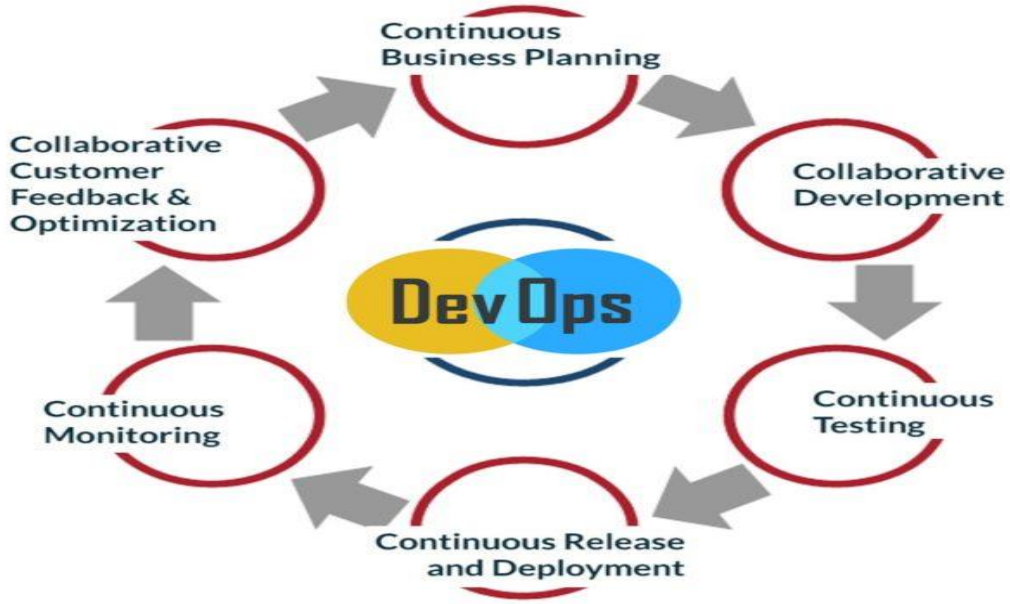

Figure 1. The DevOps Approach (Ismail, 2019).

As the authors above show, the adoption of DevOps is slowly progressing in the country. This slow progression will speed up with the continued adoption of various automation technologies and solutions. These solutions play a crucial role in influencing the overall abilities to achieve the desired performance and software security goals. From the information above, one of the issues witnessed is that the continued development of software solutions calls for the right interventions to counter the associated challenges in the security and reliability of the resulting applications. However, failing to account for the bottlenecks such as length of the development process and reduced collaboration between the various stakeholders will undermine the overall abilities to achieve the intended goals (Wettinger, Breitenbücher, Falkenthal & Leymann, 2017).

CONCLUSION

Therefore, this research is essential to the United States because it offers a chance for exploring some of the challenges that continue to affect the software development processes negatively. With the figures given above, DevOps has not yet been adopted fully in the industry. This statement shows that regardless of the progress made in software development, this framework is not familiar in various areas. The United States IT industry will need to adopt DevOps' principles to foster security in the resulting applications. Further, DevOps will reduce the time taken to accomplish a given solution. Through this research, it can be concluded that the adoption of the right interventions and the ultimate software development framework will be based on the abilities to promote the overall demands in the industry. The United States will benefit from the framework because it promotes collaboration in the development processes while eliminating the risks associated with poor performance and reduced security insight.

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