Enhancing DevOps Using Intelligent Techniques:
Application of Artificial Intelligence and Machine Learning Techniques to DevOps

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EXECUTIVE SUMMARY

Change is an inevitable part of any business. Customer satisfaction and building good will is the primary goal. The real success lies in the above two factors rather than money. Different businesses operate in different ways. Each one focuses on a different set of criteria and thus follows a different set of models. There are various models in the software development life cycle, such as the waterfall model, spiral model, V-model, and so on. These models have advantages and disadvantages and aid in the improvement of a company's workforce. They overcome the disadvantages of the previous model with each model. DevOps is the most recent model that is widely used. This chapter deals with DevOps, including the need, working, and how it differs from other models. This also looks into how intelligent techniques can be used to enhance the DevOps process for better productivity in the businesses (i.e., AIOps). It summarizes the different phases in DevOps, the corresponding machine learning or artificial algorithms that can be applied in the phases.

INTRODUCTION

DevOps is a software development model that has been recently in high demand as of around 2009 (Subramanya et al., 2022). As the name suggests DevOps derived from the words development and operation, aims to combine the development and operations parts of a software development life cycle (Faustino et al., 2022). It includes a set of activities or procedures and the necessary tools required to combine the responsibilities of both the processes of software development and its operation in the same team as shown in Figure 1.

Figure 1. A system view of DevOps
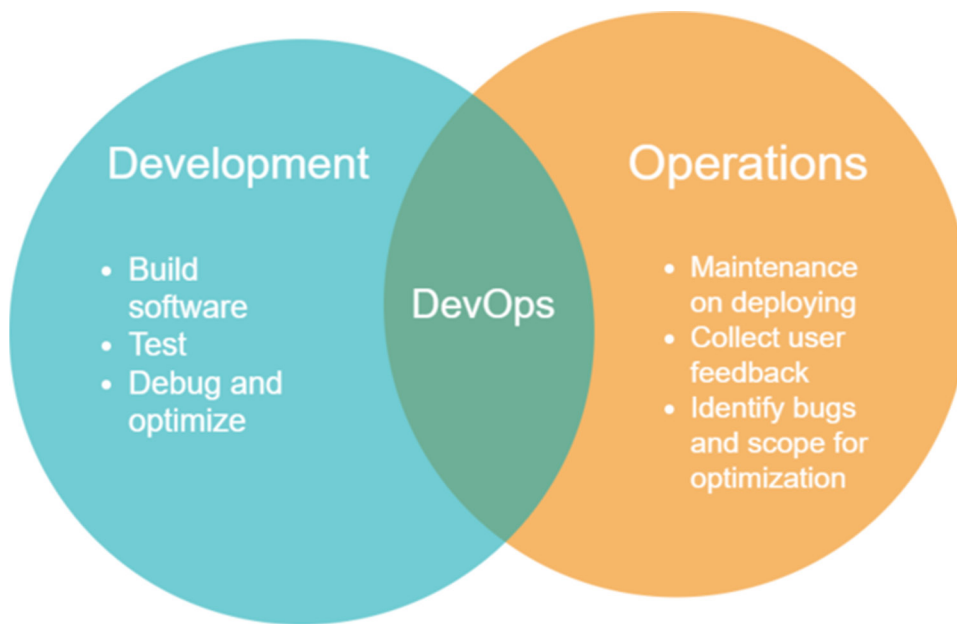
It overcame the struggles faced as a result of the development and operations team being two separate entities where one was not concerned with the activities of the other creating an obstacle to the smooth rollout of software (Subramanya et al., 2022). DevOps allows cross-functional team synchronization based on the company's philosophy and culture, hence it's more than just a set of practices. A major feature of DevOps is that it need not have major technological changes but instead focuses on team culture and coordination (Arvanitou et al., 2022). The development side of DevOps focuses on developing the software based on the client's requirements, continuously testing, debugging, and optimizing the software based on the continuous feedback received from the operations side that helps identify bugs and provides the parameters to be optimized. The simultaneous and synchronized working of the development and operations teams results in cutting down the effort required for software development and the expenditure required for its maintenance after deployment (Faustino et al., 2022).

DevOps allows the faster introduction of software into the market in a more stable manner for the company. However, since it consists of new methods and ideas which haven't been practiced by companies until recently it is still underdeveloped and consists of obstacles. These obstacles are being overcome as

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