Impact of software testing automation on the development cycle

Impacto de la automatización de las pruebas de software en el ciclo de desarrollo

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Abstract

Software development is a complex process, from its beginnings with the collection of requirements, processes are proposed for its development in order to achieve a quality product that manages to satisfy the user. Automation appears in the context of software testing development, a critical point in software development, since the quality of development depends on it. Automating software testing offers benefits in efficiency, resource optimization and product quality, also influencing the satisfaction of the development team. In conclusion, the implementation of tools that automate the software testing process will improve the software development cycle, provided they are implemented appropriately.

Keywords: Automation, technology, development, software, software testing.

Resumen

El desarrollo de software es un proceso complejo, desde sus inicios con la recopilación de requisitos, se plantean procesos para su desarrollo con la finalidad de lograr un producto de calidad que logré satisfacer al usuario. La automatización hace aparición en el contexto del desarrollo de las pruebas de software, un punto crítico en el desarrollo de software, pues de este depende la calidad del desarrollo. Automatizar las pruebas de software ofrece beneficios en eficiencia, optimización de recursos y calidad del producto, influyendo también en la satisfacción del equipo de desarrollo. En conclusión, la implementación de herramientas que automaticen el proceso de las pruebas de software mejorará el ciclo del desarrollo del software, siempre que están se implementen de manera adecuada.

Palabras claves: Automatización, tecnología, desarrollo, software, pruebas de software.

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INTRODUCTION

Software development includes multiple complex processes, which must be carried out to provide a customized product. The high demand for the development of software projects today requires the optimization of its performance from the work team.

The incorporation of tools in the software development process is an affordable alternative for programmers, providing benefits during the development process. One of the processes in which the incorporation of an automation tool is adaptable is software testing.

This process is involved in repetition, therefore adequate automation will facilitate the process.

Automating a process provides considerable benefits; However, in the software environment its effect could be variable due to the multiple variables that are applied during the software development process, considering the diversity of functionalities required of them.

Automation and technology

The adaptation of human beings to technology from its beginnings was involved in a slow process; However, the impact was significant, new technologies were easily adapted to various areas of human performance, thus being able to transform them.

Automation and technology are widely related, software development is considered one of the pillars within technology, since the operation or behavior of the hardware that houses the software depends on this process.

In this sense, software development is highly in demand; However, it is subject to requirements, which, if properly developed, provide highly reliable software.

Shree et al. (2022) mention that the process of testing, verification and validation of the software product requires an approximate of between 50% and 70% of the income, if this process is not effective it involves investing "n" times until the defects found in the software are repaired. the testing processes.

In this sense, automation is a viable alternative to accelerate this process, considering that the margin of error is greatly reduced in contrast to the development of tests carried out by a staff.

Automating processes in software development involves the application and use of specialized tools and scripts for the execution of repetitive tests, achieving the reduction of time and resources necessary for the validity of the software's functionality.

Preciado et al. (2021) considers that automation facilitates the detection of failures and errors, improves efficiency and therefore improves the quality of the final product to be obtained.

Impact of Automation on software testing

Figure 1

Impact of software test automation

Fountain: Own elaboration

Impact on efficiency and productivity

In recent years, the software industry has been oriented towards the agile approach and DevOps, due to high demand, this approach uses automation to guarantee rapid delivery and high-quality product in the shortest possible time.

Error detection is considered the most significant impact of software testing automation, directly relating this to efficiency. Automated scripts can simultaneously perform a large number of tests in a short period of time, and various failures can be identified at an early stage, thus avoiding the achievement of failures or errors at the advanced stages of the development process (Kumar & Mishra, 2016).

Test automation contributes to the acceleration of the development cycle, being able to reduce the time spent on manual testing, allowing the development team to focus on creative and critical tasks, achieving rapid and continuous deployment of the software.

The optimization of resources is another aspect that is positively influenced by the automation of tests, after minimizing the burden on testers, who can direct their attention to much more complex tests, thus guaranteeing greater coverage with the test. less effort, resulting in the maximization of resource efficiency (Preciado et al., 2021).

Impact on software quality

Software quality is a crucial aspect to achieve end-user satisfaction. In this sense, through the automation of software testing, we seek to guarantee high quality standards. The main aspects they highlight are early error detection and consistent integration (Josten & Lordan, 2022).

Detecting errors early, as already mentioned in a previous section, will allow timely correction, as a consequence the product developed will result in a quality product, due to compliance with operating standards aligned with the user's requirements.

In another context, consistent integration refers to multiple execution of tests; That is, the tests carried out repetitively will not be affected by the variability, this is directly associated with the manual tests and once this factor is minimized, it is considered that the results obtained will have greater consistency, improving the reliability and precision factor (Muhammad et al., 2021).

Impact on satisfaction from the development team

The development team is the key element in productivity and quality in the development process of a software project, coupled with the hard work, the incorporation of automation tools is an alternative to support the work carried out by the team.

Productivity is positioned as the main achievement factor with the implementation of automation.

Once the repetitive tasks are identified, they can be automated by the development team, allowing them to advance in the programming and design of other solutions that the project demands. Although individual productivity increases, a rewarding and stimulating work environment is therefore generated (Serna et al., 2021).

Impact on software project management

By itself, the word management generally encompasses the actions to achieve specific objectives, applied to software development projects, the concept focuses on the achievement of the development of the software product. In previous sections it was observed that the automation of software testing, which, although it is part of the development, significantly influences various points, be it the development itself, the work team and the product obtained.

Efficiency at the software development level is a direct consequence of the application of test automation; it is achieved through the acceleration of validation processes, facilitating compliance and guaranteeing product delivery within the established deadlines.

When software testing is carried out in an automated manner, resource optimization is addressed precisely, as it allows the reuse of scripts, as well as the allocation of resources, contributing to adequate management in terms of cost and time.

Challenges in software testing automation

The diversity of emerging platforms and the rapid evolution of technology are one of the main challenges to be addressed when considering the automation of software testing; the changing environment requires constant adaptation of the tools that will be used for the process.

On the other hand, managing resources and costs is considered a challenge, since in economic terms the acquisition of automation tools can imply a high investment, and also imply training costs because, since they are specialized tools, they require personnel to use them correctly. correct and can take advantage of all the benefits they offer.

It is necessary to address the challenges strategically by evaluating the pros and cons of the implementation and acquisition of test automation tools, since these will directly influence the software development cycle, and can provide a considerable advantage if used correctly. adequate and providing a new approach to the work team.

DISCUSSION

Technology is considered an engine of change in human development; an important part of this change is automation in technology, which is considered a relevant and transcendental milestone.

In this sense, it is observed that automation not only provides benefits, but its own implementation also represents a challenge. Different authors highlight the benefits of automation, the complexity being in adapting them to the development environment.

CONCLUSIONS

The automation of software testing directly impacts the efficiency, productivity and quality of the developed product, as well as influencing the satisfaction and better performance of the work team in charge of the project.

Implementing these technologies for the development of software projects is undoubtedly a crucial aspect, due to the advantages it provides, which must be managed correctly to obtain the greatest benefit that these tools provide.

For the implementation of these tools, it is recommended and necessary to carry out an evaluation of the characteristics that need to be evaluated, in order to get the most out of and benefit from these tools.

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