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Exploring DevOps Culture in Jewellery Web Application

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ABSTRACT: Agile methodology and DevOps processes have become popular approaches in the IT industry due to their ability to enhance software development processes and support business objectives. When applied to jewellery application development, agile methodology helps teams prioritize tasks and break down large projects into smaller, more manageable components. This approach promotes continuous feedback and collaboration, enabling teams to adjust and adapt to evolving customer needs and requirements. DevOps processes can further streamline the jewellery application development process by promoting collaboration between development and operations teams. With a focus on communication, automation, and continuous integration and delivery, DevOps enables jewellery development teams to deploy software more frequently and with greater confidence. This approach helps teams minimize downtime, reduce errors, and respond quickly to any issues that arise. Together, agile methodology and DevOps processes can help jewellery application development teams deliver high-quality software quickly and efficiently. By leveraging these approaches, jewellery businesses can enhance collaboration, speed up software delivery, and ultimately improve customer satisfaction. The ability to adapt to changing requirements and deliver software quickly is essential in the highly competitive jewellery industry, and agile methodology and DevOps processes provide a solid foundation for achieving these goals.

KEYWORDS: Agile; Devops; Git; Jenkins;Kubernetes.

I.INTRODUCTION

To effectively implement DevOps within an Agile framework, it is imperative that the development team collaborates continuously with the operational team throughout the software development lifecycle. This collaboration enhances the team's comprehension of the business objectives and the limitations and constraints of the software under development. DevOps is a culture that integrates the principles and practices of Development and IT Operations to bridge the gap between these two teams.

The primary goal is to merge both teams and enable fast software development. In DevOps, a single team is responsible for both development and operational tasks, including software development, deployment, and integration of various modules of a software product.[2][3]

DevOps facilitates Agile's release cycle by allowing communication of specifications and design documents. Sharing these documents is crucial to comprehend the complexities of continuous development and integration of the product, which speeds up the entire process. This paper highlights practical aspects of implementing DevOps in a jewellery web application project using various DevOps tools. The actual name of the client has been concealed for confidentiality purposes.

II.NEED, MARKET AND IMPORTANCE OF DEVOPS TOOLS

DevOps engineers are currently in high demand worldwide, and this is due to the widespread adoption of the DevOps culture in many industries, which provides numerous benefits. The success of organizations and IT industries that have embraced DevOps is impressive, as they have reported higher returns compared to those that still employ traditional software development approaches. This is largely attributed to the continuous development and integration properties that DevOps offers.

Despite the high demand for DevOps professionals, finding well-trained and qualified individuals is a challenging task.[1] Expertise in DevOps requires a significant amount of effort and dedication towards development and operations training.

In today's competitive jewellery landscape, customer satisfaction is a critical factor that businesses must prioritize. However, achieving this goal is not an easy task. Jewellery service providers must regularly update their services to keep up with changing customer needs and preferences. This includes adding new and improved features to their applications. Continuous development and integration facilitated by DevOps can play a significant role in achieving this, as it enables the frequent updating of application. [13]

III. APPLICATION OF DEVOPS IN JEWELLERY PROJECT

A. Project Background

"Vaishnavi Jewellery" is an e-commerce web application developed using Agile methodology and DevOps culture. The application allows shop to showcase their products on the website. Customers can view the products online and purchase them through different payment modes, including popular wallets. The development process follows the CI-CD cycle, which involves dividing numerous releases of the product into daily sprints. The project team is a cross-functional team, comprising experts from different functional areas working together towards a common goal.

An open-source container orchestration technology called Kubernetes (also known as K8s) automates, schedules, and scales the deployment of containerized applications (microservices). The Kubernetes platform is all about optimisation, streamlining the work of software developers by automating many DevOps processes that were previously carried out manually.

Various types and sizes of companies — large and small — that use Kubernetes services find they save on their ecosystem management and automated manual processes. Kubernetes automatically provisions and fits containers into nodes for the best use of resources. Some public cloud platforms charge a management fee for every cluster, so running fewer clusters means fewer API servers and other redundancies and helps lower costs.

B. Project Methodology

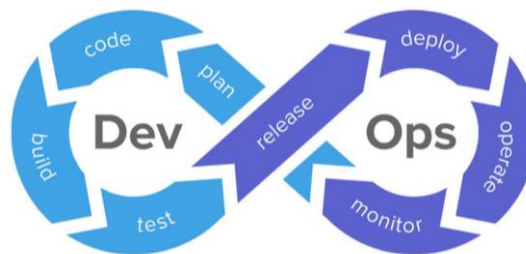


Fig. 1 DevOps architecture [8]

The team has decided that the model for software development should be Agile because it is anticipated that project requirements will change frequently, client involvement is high, and there are relatively few risks involved. To ensure the rapid development of the product, DevOps culture will support the agile model.[4] The team has incorporated some of the well-known DevOps tools, including Jenkins and Git, to bridge the gap between operational and development responsibilities.

IV. DEVOPS TOOLS USED IN PROJECT

So many DevOps tools have been developed as the IT industry and software technologies advance. The development of software products is made faster and simpler by these technologies. Some of the most widely used tools are listed here for the requested work:

A. Jenkins:-

The core of DevOps culture is Continuous Integration and Continuous Delivery or Deployment (CI/CD). Actually, CI/CD is an open-source server that gives experts the ability to automate multiple aspects of the delivery pipeline. The entire procedure of a software project can be automated using Jenkins, an open-source continuous integration server.

It's incredible how this technology can give its users access to pipelines. Jenkins is utilised in this proposed work to automatically commit code into the code repository, perform test cases in accordance with those test cases, and also fetch the reports following

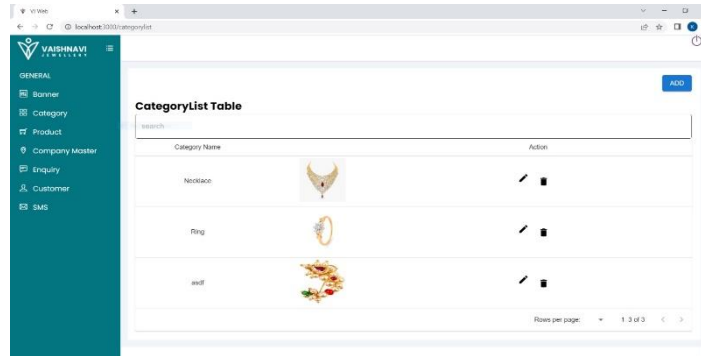


Fig. 2 CI/CD through Jenkin

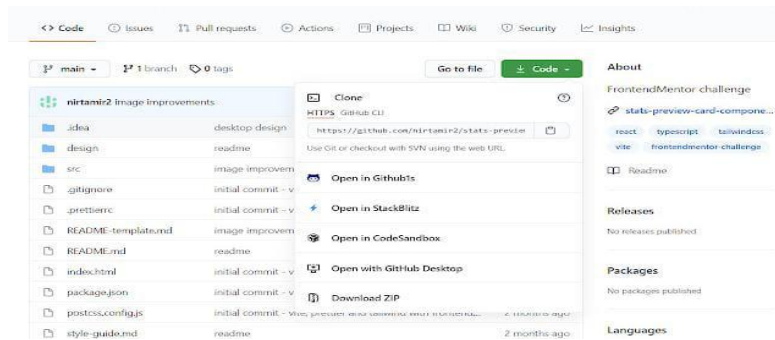


Fig 3.Implementing Project through Git

B. Git

Git is one of the widely used version control systems in IT industries nowadays. It is now treated as a standard for version control. Through this system, professionals can change the code during developing software as well as permitted to keep track of development progress [13].

Git can also provide liberty to the professional as they can use it in a distributed manner. By accessing Git distributed, one can access code repository remotely. This repository can be accessed in offline mode as well. Once the work is committed locally, then a copy of the repository is synchronized with the copy residing at the server end. Due to its flexibility and popularity, Git is used in our project for version control.

C. Ansible

Ansible is a software tool that enables powerful yet straightforward automation for cross-platform computer support. Its target audience is IT professionals, who employ it for various tasks, including application deployment, workstation and server updates, cloud provisioning, configuration management, intra-service orchestration, and most activities a systems administrator performs frequently. One of Ansible's key advantages is that it doesn't rely on agent software or require additional security infrastructure, which makes deployment a breeze. [12]

D. Kubernetes

In the IT industry, Git has become a widely adopted version control system and is now considered a standard for version control. Professionals can use this system to modify code while developing software and also to keep track of the development progress. One of the benefits of using Git is its distributed nature, which allows professionals to access code repositories remotely, even when offline. When work is committed locally, the repository is synchronized with the copy residing on the server. Given its flexibility and popularity, Git was selected as the version control system for our project. [10]

E. Docker

Docker is a platform that enables the fast development, testing, and deployment of applications. It works by combining two tools and applications into standardized units called containers that contain all the elements required for the software to run, including the code, runtime, system tools, and libraries. Using Docker, you can quickly deploy and grow your apps in any environment with the assurance that your code will function as intended.[11]

V. BENEFITS OF USING AGILE AND DEVOPS TOGETHER

DevOps and agile are among the best-known approaches that businesses must take to be successful and competitive in the IT industry. These two strategies working together has fantastic advantages for organisations. Employee engagement and consumer satisfaction can be attained to a greater and noticeable degree through these two approaches. It is without a doubt the most important and important requirement for business in the present.

Nearly 75% of respondents who used agile in conjunction with DevOps reported improved staff recruitment and retention, compared to 30% of respondents who only used agile. Yet, this is not only a fact. In the IT sector, notable developments included a 45% increase in professional productivity and a 30% increase in client satisfaction with services received.

Agile needs a DevOps culture in today's IT business settings to enable the timely delivery of software solutions. Moreover, a good DevOps culture requires agile, which should be mentioned.

VI. CHALLENGES OF USING AGILE AND DEVOPSTOGETHER

To remain competitive in the IT industry, organizations must adopt DevOps and agile methodologies. Improvements in employee engagement and customer satisfaction, two factors that are crucial for modern firms, can result from combining these two strategies.

In a survey, 75% of participants said that utilising agile and DevOps together enhanced staff retention and recruiting, compared to only 30% of participants who used agile alone. A 45% boost in productivity and a 30% rise in customer satisfaction with services were also observed in the IT sector.

Agile methodology alone cannot guarantee timely delivery of software products; a DevOps culture is necessary to achieve this goal. It is also important to note that DevOps culture cannot be successful without incorporating agile principles.[7]

A. The link between development and business solution is more crucial than ever.

The relationship between development and business solutions is more crucial than ever in the current business environment. However, the biggest challenge for organizations is to link DevOps practices with business solutions.[5]

Although adopting agile methodologies can improve the development process, this approach may not always be directly connected to business metrics. Therefore, effectively implement a DevOps culture within an organization, it is essential to establish a correlation between the timely release of products and the pertinent business metrics. This correlation ensures that the results achieved are in line with the organization's overall business goals.[9]

B. DevOps is not just a methodology, It's a culture.

DevOps is not limited to being just a methodology but is rather a culture where developers and operational professionals share their thoughts, experiences, and processes. This exchange of ideas and practices can help to improve the development and integration of software systems, ultimately leading to effective CI/CD.

The culture of DevOps promotes transparency, communication, and collaboration between development and operations teams. These values are essential in successfully implementing DevOps and creating a work environment that encourages continuous improvement and innovation

C. Development moves faster, but compliance standards are still demanding.

Even while development is advancing more quickly, regulatory requirements remain onerous. The demand for regular reporting is a high goal in agile and DevOps, yet many organisations are having trouble adhering to this approach as intended. Professionals must ensure that the agile and DevOps teams collaborate to ensure that new releases adhere to regulatory requirements.

D. Well preparation is the key to success.

Implementing DevOps cannot ensure that software products are released quickly. The timely delivery of goods is influenced by numerous factors. Rapid releases depend greatly on continuous integration, automation testing, and

DevOps operations. Professionals in the operational teams must take care to prevent bottleneck and delay issues in the internal processes. The likelihood of quick releases can be increased by careful planning and prefetching.

VII. CONCLUSION AND FUTURE SCOPE

The proposed model aims to bring together operational teams to facilitate constant testing and delivery by striking a balance between agile methodologies and DevOps tools. The benefits and challenges associated with this approach are highlighted, providing insights into potential hurdles that teams may face.

The "Vaishnavi Jewellery" project offers opportunities for improvement, as it has the potential to replace the existing management system on all office workstations.

AR is an experience that enhances rudiments of druggies physical world with computer- generated input. To do this, the developer or inventor creates a technology that allows druggies to superimpose content- images, textbooks, vids over a real-world terrain. How it works the stoked reality operation lets the client explore the finest jewellery experience by projecting the real – looking print. Although some aspects of the project, such as implementing Augmented Reality are yet to complete.

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