

Chapter 1: Introduction

1.1. Introduction

Over the course of my DevOps internship at Khalti Digital Wallet, the chance was given to fully embrace the DevOps culture and observe how it has been used effectively to bridge the gap between software development and IT operations. Khalti Digital Wallet is one of the well-known names in innovative financial solutions, offering a wide array of innovative and advanced solutions to commercial banks, development banks, financial institutions, and several other large enterprises. The company is committed to using advanced technology with the view of enhancing financial inclusion and making digital experience seamless. The primary responsibility, as a member of the DevOps team, has been to learn how to streamline and enhance the development and operational processes, so that the resulting systems could be robust, efficient, and reliable.

The main duty included understanding the implementation of DevOps practices to automate and simplify different parts of the software delivery process. This entailed creation as well as optimization of Continuous Integration/Continuous Deployment (CI/CD) pipelines which automate integration of code changes frequently and reliably should be deployed; they are important in reducing time-to-market while increasing overall development team's productivity.

Additionally, there was an opportunity was given to observe how corporations utilize automation for handling repetitive tasks in their environments. Automation not only saves time but also reduces human error, thereby increasing reliability and yielding consistent results. Practical experience was gained in automating routine operations, configuring infrastructures without any challenges, and managing applications seamlessly deployed across different systems or platforms.

Real-world experience with DevOps, complementing the theoretical knowledge I previously acquired, has been one of the best outcomes of this internship. A better understanding of the collaborative and iterative nature of DevOps was also achieved. Khalti has been able to produce quality software faster by focusing on continuous improvement, automation, and ensuring effective communication between development and operations teams. These skills and ideas will help in handling future challenges in this area, thereby contributing to becoming an even better engineer.

1.2. Problem Statement

Khalti Digital Wallet, like many tech-driven organizations, faced challenges related to the manual processes in software deployment, the scalability of their infrastructure, and the efficiency of their operational workflows. The primary issues included:

i) **Manual Deployment Processes:**

The existing deployment processes were largely manual, leading to inconsistencies, longer deployment times, and higher risk of errors.

ii) **Infrastructure Scalability:**

With a growing user base, the need for scalable infrastructure became critical. The current setup struggled to efficiently handle the increased load, affecting performance and user experience.

iii) **Operational Efficiency:**

The lack of automated workflows resulted in slower response times to incidents and less efficient use of resources.

Addressing these problems was crucial for maintaining Khalti's competitive edge, ensuring customer satisfaction, and supporting the company's growth objectives.

1.3. Objectives

The primary objectives of my internship at Khalti Digital Wallet were:

- i) **Gain Professional Experience:**
Work in a real-world corporate environment to understand team dynamics, project management, and effective communication within a professional setting.
- ii) **Develop Problem-Solving Skills:**
Tackle real-world challenges and develop solutions, enhancing critical thinking and problem-solving abilities.
- iii) **Automate Deployment Processes:**
Implement CI/CD pipelines to automate the build, test, and deployment processes, reducing deployment time and errors.
- iv) **Improve Operational Efficiency:**
Develop and integrate automated monitoring and alerting systems to enhance incident response times and operational efficiency.

1.4. Scope and Limitation

1.4.1. Scope

The scope of my internship included the following key areas:

- i) **CI/CD Pipeline Implementation:**
Setting up automated pipelines for continuous integration and deployment on bare-metal servers.
- ii) **Bare-Metal Infrastructure Management:**
Designing and deploying scalable solutions using physical servers.
- iii) **Monitoring and Alerting:**
Implementing tools like Prometheus and Grafana for monitoring and setting up alerting mechanisms.
- iv) **Security Enhancements:**
Adding security checks within the CI/CD pipeline and ensuring infrastructure compliance with security standards.

1.4.2. Limitations

Despite the comprehensive scope, there were some limitations during my internship:

- i) **Time Constraints:**
The duration of the internship was limited, which restricted the depth of exploration and implementation of certain advanced DevOps practices and tools.
- ii) **Resource Availability:**
Access to certain hardware and software resources was limited, which occasionally hindered the implementation and testing of specific solutions on a larger scale.

iii) **Learning Curve:**

The complexity of some tools and technologies, especially those I was unfamiliar with, required significant time to learn, reducing the time available for hands-on application.

iv) **Assigned Task Scope:**

The tasks assigned were predetermined, leaving limited room to explore additional areas of personal or emerging interest within the DevOps field.

1.5. Report Organization

This report is structured into four main chapters, each detailing different aspects of my internship experience at Khalti Digital Wallet. Here is a brief overview of each chapter:

i) **Chapter 1: Introduction**

This chapter introduces the work completed during my internship. It outlines the problem statement, the objectives of the internship, the scope and limitations of the project, and provides an overview of the report's organization.

ii) **Chapter 2: Organization Details and Literature Review**

In this chapter, a comprehensive introduction to Khalti Digital Wallet has been provided. This includes an overview of the organization, its hierarchy, the various domains in which it operates, and a detailed description of the department where internship has been completed. Additionally, this chapter includes a literature review or related study, highlighting relevant theories and frameworks that underpin the works that have been performed during the internship.

iii) **Chapter 3: Internship Activities**

This chapter delves into the specifics of my internship activities. It outlines my roles and responsibilities, provides a weekly log of the technical activities, describes the involved projects, and details the technical tasks and activities have been completed successfully. This section offers an in-depth look at the hands-on experience obtained.

iv) **Chapter 4: Conclusion and Learning Outcomes**

A brief overview of the experience gained during the internship is also stated in this last part, as well as the main conclusions. It mentions my skills and knowledge, challenges I faced and how I dealt with them. Additionally, the section talks about what the future holds in terms of career development after such an opportunity.

