**KAIMOSI FRIENDS UNIVERSITY**

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**School of Computing and Information Technology**

**Department of Information Technology and Informatics**

**INDUSTRIAL ATTACHMENT REPORT**

**EZEN PARTNERS**

**DENZEL GITONGA**

**SIT/0929/2020**

**22nd May 2023 \_ 4th August 2023**

The purpose of this attachment report is to provide an overview of the projects worked on, and tasks completed during the attachment period. It is submitted in partial fulfillment of requirements for the Kaimosi Friends University award of degree in Bachelor of Science in Information Technology.

# DECLARATION

I, Denzel Gitonga, hereby declare that this project is my original work and has not been presented in any other institution of learning for the award of a degree.

Denzel Gitonga

SIT/0929/2020

Signature: ………………………………….

Date: ………………………………………

# CERTIFICATION

The undersigned certify that they have successfully completed the development of their assigned projects, and tasks during their attachment period.

The applications meet the specified requirements and demonstrate proficiency in programming, IT Support, and computer fundamentals.

**Supervisor: Madam Lillian Rono.**

Department of Information Technology and Informatics.

School of Computing and Information Technology.

Kaimosi Friends University.

Signature: …………………………………

Date: ………………………………………

# ACKNOWLEDGEMENT.

First and foremost, I would like to give thanks to the almighty God who has counted me worthy to develop this project till its completion.

I would also like to express my gratitude to Ezen Partners for providing valuable guidance and mentorship throughout the development process, for sharing their expertise in database management and optimization, for assisting in GUI design and providing feedback on user experience, and for their assistance in testing the application and providing constructive feedback for improvement.

Thank you all for being an integral part of this incredible journey.

# DEDICATION.

I dedicate this project to the development team and mentors at Ezen Partners for their guidance, support, and valuable insights throughout the project. Their expertise and encouragement were instrumental in completing this application successfully.

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# CHAPTER ONE: INTRODUCTION

# Introduction

During my attachment at Ezen Partners, I had the opportunity to work on and develop two significant projects: a Point of Sale (POS) system and a mini/small chatbot, both built using Django.

The primary aim of this report is to document my experiences and achievements during this attachment period. The introduction provides an overview of the projects undertaken, highlighting their importance and relevance to Ezen Partners. Throughout this report, I will delve into the development processes, challenges faced, solutions implemented, and the overall impact of these projects on the company's operations.

This chapter sets the foundation for a comprehensive exploration of my journey as a developer and the value-added to the organization during this enriching experience at Ezen

# Information About The Organisation

Ezen Partners is a leading software development company that provides IT consultancy software design and development as well as professional services and hardware deployment and maintenance to Government Institutions, Real Estate, Saccos and Microfinance institutions, Welfare Associations, Education, Motor Vehicle companies and other business enterprises.

Since 2013 they are a Swiss Army knife when it comes to automated and efficient property management solutions that enable landlords and managers of residential and association properties to take complete control of every aspect of their business, including the rent, vacancy and maintenance cycles. Their commitment to excellence and innovation has positioned them as a trusted and reputable player in the software development company.

# Mission of The Organisation

Their mission is to deliver the best possible reliable software solutions to help our clients improve IT efficiency and business profitability by;

* Providing high quality software development services, professional consulting and development outsourcing that would improve their customers operation, making access to information easier and secure.
* Improving communication and data exchange (Business to Business), Providing their customers with a value for money.
* Providing their employees with meaningful work and advancement opportunities.

# Vision of The Organisation

Their vision is to create a world class IT Organization in terms of people, process and technology and to become a globally respected corporation by providing high quality and cost-effective software products and service to its customers in its chosen technical segment

# 1.5 Structure of the Organisation.

Fig A. Organization Structure

# 1.5.1 Description of The Departments and Their Activities

1. Director - help in product development and business development.

2. HR - she runs payroll and manage employee welfare

3. Head System developer - he is the system development lead

4. Head of Sales and Marketing Executive:

* She is the Marketing consultant
* She is also the point of contact with clients

5. Head System Implementation - helps in project implementation, and management.

# CHAPTER TWO: WORK EXPERIENCE

# 2.1 Duties and Responsibilities

During my attachment at Ezen Partners, I undertook various duties and responsibilities, contributing significantly to the development and enhancement of the company's projects.

These are as follows:

# 2.1.1 Point of Sale (POS) System Development

Conducted an in-depth analysis of the existing POS system requirements and identified areas for improvement.

Collaborated with the development team and stakeholders to gather valuable insights into user needs and expectations.

Designed and implemented new features and functionalities for the POS system using Django, ensuring seamless integration with the existing system.

Utilized Django's Model-View-Template (MVT) architecture to create a robust and scalable application structure.

Conducted thorough testing and debugging to identify and rectify any potential issues, ensuring the system's reliability and accuracy.

Contributed to the development of an intuitive user interface for the POS system, enhancing the overall user experience.

# 2.1.2 Mini/Small Chatbot Development

Undertook an extensive analysis of chatbot requirements and evaluated different approaches for its implementation.

Utilized Django's capabilities to design and develop the chatbot, enabling efficient communication with users.

Integrated Natural Language Processing (NLP) algorithms to improve the chatbot's understanding and response to user queries.

Incorporated iterative design practices, creating mock-ups and prototypes to gather feedback and refine the chatbot's user interface and functionality.

Conducted rigorous testing to ensure the chatbot's accuracy and responsiveness in various scenarios.

Assisted in the deployment of the chatbot, making it accessible to users through the company's preferred communication channels.

# 2.1.2 Collaboration and Communication

Actively collaborated with team members, project managers, and stakeholders to align development efforts with business goals.

Participated in regular meetings to discuss project progress, challenges, and potential solutions, fostering effective teamwork.

Maintained clear and concise documentation of the development process, making it easier for team members to understand and contribute to the projects.

Demonstrated strong communication skills to interact with non-technical stakeholders, understanding their requirements, and translating them into technical specifications.

# 2.1.3 Data Integration

During my attachment at Ezen Partners, I effectively integrated the Django-based Point of Sale (POS) system and the mini/small chatbot with relevant data sources. This integration included connecting the applications to databases, enabling the retrieval and manipulation of essential data within their respective interfaces.

By employing Django's data handling capabilities, I ensured that users could seamlessly interact with data, enhancing the overall user experience. Moreover, I implemented mechanisms for data validation, persistence, and synchronization to maintain data accuracy and consistency across both applications.

# 2.1.4 Setting up the Database

A pivotal aspect of the Point of Sale system and the chatbot development involved the configuration of the databases.

I meticulously selected appropriate database management systems (DBMS) that aligned with the nature of each application. After successful installation and configuration, I designed the database schemas to accommodate the data requirements of both applications. This encompassed creating tables, defining relationships, and establishing columns to effectively store and manage the application-specific data.

# 2.1.5 Django ORM (Object-Relational Mapping)

To establish a robust connection between the Django applications and the databases, I leveraged Django's Object-Relational Mapping (ORM) capabilities. This allowed me to interact with the databases using Python classes and methods, rather than direct SQL queries. Through the ORM, I managed to execute database operations seamlessly, ensuring efficient communication and data manipulation.

# 2.1.6 Query Execution

Within the Django framework, I skillfully formulated Python code to execute diverse database queries, retrieving and manipulating data as required by the applications. To uphold security standards, I utilized Django's query mechanisms, preventing SQL injection vulnerabilities and ensuring data integrity.

This approach contributed to the applications' ability to interact with the databases securely and effectively.

# 2.1.7 Synchronizing Data with the User Interface

Within the Point of Sale system and the chatbot interfaces, I orchestrated the synchronization of data with the user interface. By implementing appropriate data models, listeners, and event handlers, I ensured that user interactions prompted real-time updates and modifications to the displayed data.

Employing Django's template rendering capabilities, I achieved a seamless connection between the backend data and the frontend user interface.UI.

# 2.1.8 Data Validation and Security

I prioritized data validation to ensure the accuracy and integrity of the data processed by the applications. Through Django's form validation mechanisms, I implemented thorough validation checks, preventing erroneous data input.

To bolster security, I integrated input sanitization techniques to mitigate potential security risks. Additionally, I enforced authentication and authorization mechanisms within the Django framework, safeguarding the databases against unauthorized access and ensuring data security.

# 2.1.9 Testing and Debugging

Throughout the development lifecycle, I rigorously conducted testing procedures to validate the effectiveness of the Django-based applications. I performed unit tests to verify the functionalities of the data integration, database connectivity, and data manipulation processes. Whenever challenges arose, I adeptly employed debugging tools and techniques to identify and resolve issues promptly.

Integration testing was also undertaken to ensure the seamless alignment between the Django applications and the integrated data sources. To facilitate error diagnosis during runtime, I implemented logging mechanisms to track and record potential errors and anomalies.

# 2.2.0 Documentation and Maintenance

Throughout my attachment at Ezen Partners, I prioritized the creation of comprehensive documentation for the integration of databases within the Django-based Point of Sale (POS) system and the mini/small chatbot projects. This documentation detailed the strategies and tools employed to establish seamless data retrieval, manipulation, and synchronization. By maintaining clear documentation, I facilitated collaboration within the team and provided valuable insights into the database connectivity process.

In addition, I adopted a robust version control system to meticulously track changes made to the codebase. This approach allowed for transparent communication among team members, enabling them to comprehend the progression of the database integration. Continuously updating this documentation as modifications were introduced ensured that the team remained informed about the latest developments in the database connectivity.

Furthermore, I ensured ongoing support and maintenance for both applications. This involved promptly addressing user feedback, troubleshooting technical issues, and optimizing the performance of the database interactions. By doing so, I contributed to the reliability and effectiveness of the applications' database functionalities, ensuring a sustainable and efficient user experience.

In summary, my commitment to thorough documentation, version control, and proactive maintenance significantly enhanced the successful execution of database connectivity within the Django-based projects at Ezen Partners. These practices not only streamlined development but also ensured the longevity and effectiveness of the applications' database interactions over time.

# CHAPTER THREE: ANALYSIS OF CORPORATE INTERNSHIP EXPERIENCE

# Introduction

This chapter presents an analysis of my corporate internship experience at Ezen Partners, focusing on the development of the Point of Sale (POS) system and the mini/small chatbot using the Django framework.

The analysis covers limitations encountered during the development process, a comprehensive conclusion regarding the outcomes of the internship, key findings that emerged from the experience, and recommendations for future endeavors.

# Findings

The internship revealed several key findings.

Firstly, Django's flexibility and efficiency significantly expedited the development process, allowing for the creation of feature-rich applications within a limited timeframe.

Secondly, user-centered design principles, including iterative feedback and user testing, were instrumental in shaping user-friendly interfaces. The integration of database management through Django's ORM streamlined data interactions and ensured data integrity.

Lastly, maintaining a balance between innovation and practicality was crucial, given the limitations and resources available.

# Limitations

During the internship, several limitations became evident. Time constraints were a prominent challenge, impacting the depth of feature exploration and optimization. The rapid pace of development sometimes compromised the opportunity for in-depth analysis and testing.

Furthermore, resource limitations affected the extent to which cutting-edge technologies and functionalities could be incorporated.

These constraints, while unavoidable, provided insights into the need for strategic planning and allocation of resources for future projects.

# Summary

In summary, the analysis of the corporate internship experience underscores the practical value of the Django framework in application development. Despite limitations, the experience contributed to skill enhancement, insights into software development dynamics, and an appreciation for the collaborative nature of corporate projects. The internship serves as a foundation for continuous learning and growth in the realm of software development.

# CHAPTER FOUR: Conclusion and Recommendations

# 4.0 Conclusion

In the course of my corporate internship at Ezen Partners, I accomplished significant milestones through the successful development of the Django-based Point of Sale (POS) system and the mini/small chatbot.

These applications highlighted the potential of Django's framework in creating efficient, user-friendly solutions that facilitate data handling and seamless user interactions.

The internship allowed me to bridge theoretical knowledge with practical application, showcasing the efficacy of agile development methodologies in a real-world corporate setting.

Generally, the internship at Ezen Partners was an enriching journey that highlighted both successes and areas for improvement. The accomplishments with the Django applications underscore the potential of technology in transforming business operations.

# 4.1 Accomplishments

The successful integration of the Django framework with the POS system and the chatbot stands as a testament to the adaptability and power of Django in modern application development. The applications showcased intuitive user interfaces, effective data synchronization, and secure database interactions.

By following best practices such as user-centered design, iterative feedback loops, and comprehensive documentation, I contributed to the creation of valuable tools for Ezen Partners.

# 4.2 Unachieved Objectives

Despite the achievements, certain objectives weren't fully realized due to time constraints and resource limitations.

Exploring advanced functionalities, more comprehensive user testing, and the integration of cutting-edge technologies remained areas where further development could have been pursued.

# 4.2 Lessons Learned

Reflecting on the experience, I recognize the importance of strategic planning, especially in terms of allocating adequate time for in-depth analysis, design, and testing phases.

A more phased approach to development could have allowed for a deeper exploration of features and smoother integration of complex functionalities.

Furthermore, fostering a balance between innovation and practicality is vital in order to achieve both project goals and user expectations.

# 4.2 Recommendations

In response to criticisms raised during the internship, I propose several recommendations:

* Organizational Internship Program

To enhance the internship experience, the organization could consider establishing a structured onboarding process, offering a clear roadmap of expectations, responsibilities, and available resources. Regular mentorship sessions and progress evaluations would provide interns with valuable guidance and feedback.

* Business Processes

The organization might benefit from streamlining communication channels and project management practices. Clearer task assignments, regular progress updates, and dedicated channels for feedback could facilitate smoother collaboration and minimize confusion.

* Coursework Alignment

To bridge the gap between academic coursework and practical experience, the organization could collaborate with educational institutions to align internship projects more closely with ongoing coursework. This would enable interns to apply classroom learning directly to real-world projects.

By implementing the recommended enhancements, the organization can better align its internship program, business processes, and coursework, fostering a more productive and mutually beneficial environment for future interns and the organization alike.

# APPENDIX I

## Work plan/ timelines of activities.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 8th May,2023-13th May,2023 | | 15th May 2023 – 27th May 2023 |  |  | 29th May, 2023 – 10th May 2023 | 12th June, 2023 – 24th June, 2023 |  |  | 26th June, 2023 – 1st July, 2023 |
| WEEK(s)  TASK(s) | 1 | 1 | | 2 | 1 | 4 | 1 | 2 | 1 | 4 |
| Setup the foundational structure of the chatbot. |  |  | |  |  |  |  |  |  |  |
| Implemented Chatting API, with websockets |  |  | |  |  |  |  |  |  |  |
| Deployment onto the Railway platform/server |  |  | |  |  |  |  |  |  |  |
| Point of Sale System Development |  |  | |  |  |  |  |  |  |  |
| System Testing and Validation |  |  | |  |  |  |  |  |  |  |
| Documentation writing and Presentation |  |  | |  |  |  |  |  |  |  |

Fig B. Work Plan & Timelines of Activities.

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