# **GRADUATION THESIS**

# Developing and building website Helpdesk using OdooErp

Vũ Tự Học

hoc.vt187236@sis.hust.edu.vn

**Major: Information Technology Specialization: Information Technology** 

| Supervisor: | M.Sc. Nguyen Nhat Hai |           |
|-------------|-----------------------|-----------|
|             |                       | Signature |

**Department:** Computer Science

**School:** Information and Communications Technology

HANOI, 12/2023

#### **ACKNOWLEDGMENTS**

First of all, I'd like to give my sincere thanks to my honorific supervisor, M.Sc. Nguyen Nhat Hai, who offered me so much advice, patiently supervising me, and always guiding me in the right direction. He has helped me understand the power of perseverance and focus during the project's implementation. I've learned a lot from him, without his help I could not have finished my thesis successfully.

In particular, I would like to thank ANSV Telecommunications Equipment Company Limited for providing convenient conditions and support during the completion of this thesis. I would like to express my appreciation to Ms. Tran Thanh Nga and Mr. Doan Huu Thanh who have offered me their time when I collected necessary data for my project. Throughout this journey, I have gained valuable theoretical and practical knowledge. I am especially grateful for Mr. Ta Duy Doan's guidance and comments on the project's implementation.

Additionally, I would like to express my gratitude to all the professors and lecturers at the School of Information Technology and Communication, Hanoi University of Science and Technology, along with the faculty who have supported me and provided favorable conditions during my studies at the university and throughout the process of completing this thesis. There are so many friends in LTU15, who offered me so much kindly help. I give my sincere thanks to all these people.

Last but not least, I am very grateful for my parents. Their understanding and their love encouraged me to work hard and to continue pursuing the project completion. Their firm and kind-hearted personality have affected me to be steadfast and never bend to difficulty. They always let me know that they are proud of me, which motivates me to work harder and do my best.

#### **ABSTRACT**

Human society is gradually entering the 4.0 technology revolution; this is the era of the software industry with inventions of high intelligence and practicality. In recent times, the internet and networked systems make helpdesk software more interactive and participatory for customers. Customer service and helpdesk software systems have become increasingly popular in recent times. In the field of information technology, IT helpdesk is part of the IT department, responsible for receiving and answering technical inquiries and questions from customers. IT helpdesk provides technology services, and solves technology and computer related problems. Communication is often done through a variety of means such as email, phone, website, or online chat.

Today the IT support could be overwhelmed with loads of requests from the clients within the ANSV Telecommunications Equipment Company Limited (part of VNPT Technology, Vietnam Posts and Telecommunications Group) through email, which is an inefficient way to store and manage information of each complaint. Tracking down the list of requests is also an issue. For the goals to ensure the achievements of expanding to new clients, IT support needs a better alternative way to manage, store, and retrieve information. A better management system is required for receiving, responding to, monitoring, and retrieving client requests. It is also important for the IT department in future because ANSN is planning to expand to new major clients.

Therefore, I have decided to choose a topic for my project: "Developing and building website helpdesk using OdooErp". The software architect pattern in this project is Model View Control and applied with the programming language of Odoo and HTML. The helpdesk website is developed and built for supporting ANSV recent clients. The helpdesk website is to manage a process of a customer support system. The application interface has been implemented with a high level of completion, fully meeting all the functional requirements of the system. The interface ensures that all system functions operate accurately and effectively. New user experience design in the helpdesk system has optimized the operating process.

Student *Vũ Tư Học* 

# TABLE OF CONTENTS

| CHAPTER 1. INTRODUCTION                         | 1  |
|---|----|
| 1.1 Problem statement                           | 1  |
| 1.2 Objectives and scope                        | 1  |
| 1.3 Solution Orientation                        | 2  |
| 1.4 Organization of Thesis                      | 3  |
| CHAPTER 2. SURVEY AND ANALYSIS                  | 4  |
| 2.1 Status survey                               | 4  |
| 2.2 Functional Overview                         | 8  |
| 2.2.1 General use case diagram                  | 8  |
| 2.2.2 Detailed use case diagram                 | 10 |
| 2.2.3 Business process                          | 15 |
| 2.3 Functional description                      | 21 |
| 2.3.1 Customer registration                     | 21 |
| 2.3.2 Customers manage accounts                 | 22 |
| 2.3.3 Helpdesk team approve the system accounts | 23 |
| 2.3.4 Customer submit tickets                   | 24 |
| 2.3.5 Helpdesk team configs SLA policies        | 25 |
| 2.3.6 Helpdesk team handling tickets            | 26 |
| 2.4 Non-functional requirement                  | 26 |
| 2.4.1 Usability                                 | 26 |
| 2.4.2 Content management                        | 27 |
| 2.4.3 Scalability                               | 27 |
| 2.4.4 Performance                               | 27 |

| CHAPTER 3. TECHNOLOGY                                  | 28 |
|--|----|
| 3.1 HTML   | 28 |
| 3.1.1 HTML Overview                                    | 28 |
| 3.1.2 How HTML works                                   | 28 |
| 3.2 CSS  | 29 |
| 3.2.1 CSS Overview                                     | 29 |
| 3.2.2 How CSS works                                    | 29 |
| 3.3 JavaScript   | 30 |
| 3.3.1 JavaScript Overview                              | 30 |
| 3.3.2 How JavaScript works                             | 30 |
| 3.4 Qweb   | 31 |
| 3.4.1 Qweb Overview                                    | 31 |
| 3.4.2 How Qweb works                                   | 32 |
| 3.5 Python   | 32 |
| 3.5.1 Python Overview                                  | 32 |
| 3.5.2 How python programs work                         | 32 |
| 3.6 Odoo   | 33 |
| 3.6.1 Odoo Overview                                    | 33 |
| 3.6.2 Advantages of Odoo                               | 34 |
| 3.7 ORM in Odoo  | 34 |
| 3.7.1 ORM Overview                                     | 34 |
| 3.7.2 Advantages of ORM                                | 35 |
| 3.8 PostgreSQL database                                | 35 |
| 3.8.1 PostgreSQL overview                              | 35 |
| 3.8.2 How PostgreSQL works                             | 36 |
| 3.8.3 Advantages and Disadvantages of using PostgreSOL | 36 |

| 3.9 Docker  | 38 |
|---|----|
| 3.9.1 Docker Overview                               | 38 |
| 3.9.2 How Docker works                              | 38 |
| CHAPTER 4. EXPERIMENT AND EVALUATION                | 40 |
| 4.1 Architecture design                             | 40 |
| 4.1.1 Software architecture selection               | 40 |
| 4.1.2 Overall design.                               | 42 |
| 4.1.3 Detailed package design                       | 43 |
| 4.2 Detailed design                                 | 45 |
| 4.2.1 User interface design                         | 45 |
| 4.2.2 Layer design                                  | 50 |
| 4.2.3 Database design                               | 56 |
| 4.3 Application Building.                           | 59 |
| 4.3.1 Libraries and Tools                           | 59 |
| 4.3.2 Achievement                                   | 59 |
| 4.3.3 Illustration of main functions                | 59 |
| 4.4 Testing   | 65 |
| 4.4.1 Customers raise and submit tickets test cases | 65 |
| 4.4.2 System Administrator creates SLA test cases   | 67 |
| 4.4.3 Helpdesk team handles tickets test cases      | 68 |
| 4.4.4 Number of the test cases and its results      | 70 |
| 4.5 Deployment                                      | 70 |
| 4.5.1 Deployment Set up by Step                     | 70 |
| CHAPTER 5. SOLUTION AND CONTRIBUTION                | 74 |
| 5.1 Manage SLA Policies using Website Helpdesk      | 74 |
| 5.1.1 SLA Problem                                   | 74 |

| 5.1.2 Proposed solution                      | 75 |
|--|----|
| 5.1.3 Experimental results                   | 77 |
| 5.2 User Experience Design                   | 78 |
| 5.2.1 Design Problem                         | 78 |
| 5.2.2 Proposed solution                      | 78 |
| 5.2.3 Experimental results                   | 79 |
| CHAPTER 6. CONCLUSION AND FUTURE DEVELOPMENT | 80 |
| 6.1 Achievements                             | 80 |
| 6.2 Limitations.                             | 80 |
| 6.3 Future scope                             |    |
| REFERENCE                                    | 84 |

# LIST OF FIGURES

| Figure 2.1  | General use case diagram                                | 9          |
|-------------|---|------------|
| Figure 2.2  | Encoding of customers' info-helpdesk teams side usecase |            |
| diagra      | m   | 10         |
| Figure 2.3  | Encoding of customers' info-customer side usecase dia-  |            |
| gram        |   | 10         |
| Figure 2.4  | User login use case diagram                             | 11         |
| Figure 2.5  | Customer raise and submit use case diagram              | 11         |
| Figure 2.6  | Helpdesk team accpet and confirm customer request use   |            |
| case d      | iagram  | 12         |
| Figure 2.7  | Ticketing operations use case diagram                   | 12         |
| Figure 2.8  | SLA configs use case diagram                            | 13         |
| Figure 2.9  | Report and Dashboard use case diagram                   | 14         |
| Figure 2.10 | Customer registration activity diagram                  | 15         |
| Figure 2.11 | Customers submit tickets activity diagram               | 16         |
| Figure 2.12 | SLA policies configs activity diagram                   | 17         |
| Figure 2.13 | Ticketing operations activity diagram                   | 20         |
| Figure 4.1  | Overall package diagram                                 | 43         |
| Figure 4.2  | Package diagram for system authentication               | 44         |
| Figure 4.3  | Package diagram for ticket management                   | 44         |
| Figure 4.4  | Homepage prototype interface                            | 48         |
| Figure 4.5  | Ticket Form portal prototype interface                  | 48         |
| Figure 4.6  | Ticket Detail portal prototype interface                | 49         |
| Figure 4.7  | Overview internal prototype interface                   | <b>1</b> 9 |
| Figure 4.8  | List view internal prototype interface                  | 50         |
| Figure 4.9  | Form view internal prototype interface                  | 50         |
| Figure 4.10 | Users Class   | 51         |
| Figure 4.11 | HelpdeskTicket Class                                    | 52         |
| Figure 4.12 | Customer Register sequence                              | 53         |
| Figure 4.13 | Customer create ticket sequence                         | 54         |
| Figure 4.14 | Admin management ticket sequence                        | 54         |
| Figure 4.15 | Message send to customer sequence                       | 55         |
| Figure 4.16 | E-R Diagram   | 56         |
| Figure 4.17 | Ticket design   | 57         |
| Figure 4.18 | Project design  | 57         |

| Figure 4.19 | SLA design  | 58 |
|-------------|---|----|
| Figure 4.20 | Customer design   | 58 |
| Figure 4.21 | Team design   | 58 |
| Figure 4.22 | Form ticket portal Screen                                 | 60 |
| Figure 4.23 | Details ticket portal Screen                              | 61 |
| Figure 4.24 | Details ticket internal Screen                            | 61 |
| Figure 4.25 | Details SLAs internal Screen                              | 62 |
| Figure 4.26 | Details ticket with SLAs internal Screen                  | 63 |
| Figure 4.27 | Rating email templates                                    | 63 |
| Figure 4.28 | ticket web ribbon when closed                             | 64 |
| Figure 4.29 | Internal user Overview screen                             | 64 |
| Figure 4.30 | Internal user Dashboard screen                            | 65 |
| Figure 4.31 | Customer register an account test case                    | 65 |
| Figure 4.32 | Registered customer submit tickets test case              | 66 |
| Figure 4.33 | Unregistered customer submit tickets test case            | 66 |
| Figure 4.34 | System admin add new SLA test case                        | 67 |
| Figure 4.35 | System admin edit SLA test case                           | 67 |
| Figure 4.36 | Admin delete SLA policies                                 | 68 |
| Figure 4.37 | Helpdesk team talks to customers                          | 68 |
| Figure 4.38 | Helpdesk team lead schedules tickets and assigns to staff | 69 |
| Figure 4.39 | Helpdesk team agent addresses the authorized tickets      | 69 |
| Figure 5.1  | SLA role in the helpdesk system workflow                  | 74 |
| Figure 5.2  | Theoretical framework of the improved ticket scheduling   |    |
| algorit     | thm   | 75 |
| Figure 5 3  | Hierarchical structure model dingram                      | 76 |

# LIST OF TABLES

| Bảng 2.1 | The important features of the helpdesk website                 | 8  |
|----------|--|----|
| Bảng 2.2 | The system overview  | 9  |
| Bảng 2.3 | The functional description of customer register for an account | 21 |
| Bảng 2.4 | The functional description of the customers manage their ac-   |    |
| coun     | ts   | 22 |
| Bảng 2.5 | The functional description of the administrator approve the    |    |
| syste    | m accounts   | 23 |
| Bảng 2.6 | The functional description of the customers submit tickets     | 24 |
| Bảng 2.7 | The functional description of the SLA configs                  | 25 |
| Bảng 2.8 | The functional description of the ticketing operations         | 26 |
| Bảng 4.1 | Model in Module  | 41 |
| Bảng 4.2 | View in Module   | 41 |
| Bảng 4.3 | Controller in Module   | 42 |
| Bảng 4.4 | Description of the portal screen                               | 45 |
| Bảng 4.5 | Description of the internal screen                             | 46 |
| Bảng 4.6 | User interface design standards                                | 47 |
| Bảng 4.7 | list of libraries and tools                                    | 59 |
| Bảng 4 8 | list of libraries and tools                                    | 59 |