



Pulse-HR: Web Based Payroll System with Robust Cybersecurity

UNDERGRADUATE THESIS
Submitted as one of the requirements to obtain
Sarjana Komputer (S.Kom.)

By:
AMELIA FEGA ADE TAHER
001202200113

FACULTY OF COMPUTER SCIENCE
INFORMATION TECHNOLOGY
CIKARANG
JULY, 2025

SIMILARITY INDEX REPORT

Individual Report Amel.docx

ORIGINALITY REPORT

11 %	8 %	2 %	9 %
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to President University Student Paper	1 %
2	www.pedrotech.co Internet Source	1 %
3	Submitted to University of Northampton Student Paper	1 %
4	Submitted to City University Student Paper	1 %
5	repository.president.ac.id Internet Source	1 %
6	medevel.com Internet Source	1 %
7	www.datanovia.com Internet Source	<1 %
8	Submitted to Technological Institute of the Philippines Student Paper	<1 %
9	<u>codedrop.vercel.app</u> Internet Source	<1 %
10	dev.to Internet Source	<1 %

GPT ZERO RESULT

Amelia Fega Ade Taher

Thesis_Document_Amelia

 Thesis Computing

Document Details

Submission ID

trn:oid::3618:112266393

Submission Date

Sep 15, 2025, 1:52 AM GMT+7

Download Date

Sep 15, 2025, 8:42 AM GMT+7

File Name

Thesis_Document_Amelia.pdf

File Size

2.3 MB

249 Pages

20,213 Words

110,018 Characters



Page 1 of 251 - Cover Page

Submission ID trn:oid::3618:112266393



Page 2 of 251 - AI Writing Overview

Submission ID trn:oid::3618:112266393

*% detected as AI

AI detection includes the possibility of false positives. Although some text in this submission is likely AI generated, scores below the 20% threshold are not surfaced because they have a higher likelihood of false positives.

Caution: Review required.

It is essential to understand the limitations of AI detection before making decisions about a student's work. We encourage you to learn more about Turnitin's AI detection capabilities before using the tool.

Disclaimer

Our AI writing assessment is designed to help educators identify text that might be prepared by a generative AI tool. Our AI writing assessment may not always be accurate (i.e., our AI models may produce either false positive results or false negative results), so it should not be used as the sole basis for adverse actions against a student. It takes further scrutiny and human judgment in conjunction with an organization's application of its specific academic policies to determine whether any academic misconduct has occurred.

ABSTRACT

The rapid advancement of technology, especially in web-based technology, has opened opportunities to create innovative solutions to problems that exist in companies, especially in the use of less efficient payroll systems and the utilization of fingerprint attendance machine technology for attendance, and the complicated process of applying for leave to companies that go through many processes. This Capstone Project introduces “Pulse - HR,” a web-based system that is designed to efficiently manage the payroll system, attendance, and leave permissions in one process. This system provides features according to role. There are features to make leave requests, see the history of payslip that the system has done, equipped with various features to help users apply for leave to the company, know the history of payroll/payslip that the system has done, and there is also a feature to monitor user logs. This way, employees can submit leave directly to the system, eliminating the need for a manual process that involves multiple steps and documents. Besides that, it also makes it easier for HRD to process payroll automatically and perform employee management on this system. Because it has been integrated with attendance data on the company's fingerprint machine, there is no need for HRD to process it using Excel.

The system is equipped with security features, including encryption and the Log Access feature, which allows for the monitoring of all user login activities. This Capstone project also went through a process of testing and user reviews to evaluate the functionality of the system. The results obtained show a positive response, indicating that all system functionalities can run well and solve the problem of payroll system, attendance, and leave permissions in one system with security protection to maintain system security.

Keywords: Web-based system, Payroll, attendance, Security

TABLE OF CONTENTS

STATEMENT OF ORIGINALITY	i
SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST	ii
SIMILARITY INDEX REPORT.....	iv
DEDICATION.....	vi
ACKNOWLEDGMENTS.....	i
TABLE OF CONTENTS.....	ii
LIST OF TABLES	v
LIST OF FIGURES	vii
CHAPTER 1.....	1
PROPOSAL (F100)	1
1.1 Problem Formulation.....	1
1.2 Problem Constraint Analysis.....	6
1.3 Problem Functional Analysis	8
1.4 Solution Selection	9
1.5 Solution Usage Scenario	14
1.6 Development Effort.....	16
1.7 Conclusion.....	20

CHAPTER 2.....	22
SPECIFICATION (F200)	22
2.1 Existing And Proposed System.....	22
2.2 Global Description of the Product.....	27
2.3 Requirement Analysis	33
2.4 Specification Testing.....	61
CHAPTER 3.....	63
DESIGN (F300).....	63
3.1 Alternative Solution Designs	63
3.2 Rational/Systematic Design	70
3.3 Hierarchical/Iterative Design	78
3.4 Verification Demonstration And Proof Of Design Process	101
3.5 Standards Used.....	106
3.6 Implementation And Testing Plans	107
CHAPTER 4.....	109
IMPLEMENTATION (F400).....	109
4.1 Designs Implementation.....	109
4.2 Product Display	173
4.3 Component Cost Analysis.....	179
4.4 Manual Guide.....	180
4.5 Video Demonstration	215

CHAPTER 5.....	216
TESTING (F500)	216
5.1 Restate The Problem As Stated In The F-100 Document	216
5.2 Restate The Specifications Stated In The F-200 Document.....	217
5.3 Functional Testing.....	224
5.4 Testing Other Specifications	240
5.5 Conclusion.....	249

LIST OF TABLES

Table 1. 1 Solution Selection.....	12
Table 1. 2 Man-months.....	16
Table 1. 3 Development Tools.....	16
Table 1. 4 Timelines	18
Table 2. 1User Characteristics	29
Table 2. 2 Use-Case Scenario Input Leave Request.....	35
Table 2. 3 Use-Case Scenario View Leave Request Status.....	35
Table 2. 4 Use-Case Scenario View and Download Payslips Report.....	36
Table 2. 5 Use-Case Scenario Update Profile Photo	36
Table 2. 13 Use-Case Scenario Edit User Password	37
Table 2. 14 Use-Case Scenario View Login Activity and Download Report	38
Table 2. 15 Data Dictionary of salary_history	40
Table 2. 16 Data Dictionary of users.....	41
Table 2. 17 Data Dictionary of salary_components	42
Table 2. 18 Data Dictionary of holidays	43
Table 2. 19 Data Dictionary of position_salaries	43
Table 2. 20 Data Dictionary leave_requests.....	44
Table 2. 21 Data Dictionary salary_component	45
Table 2. 22 Data Dictionary attendance.....	46
Table 2. 23 Data Dictionary password_resets	46
Table 2. 24 Data Dictionary password_history	47
Table 2. 25 Data Dictionary login_activity	48
Table 2. 26 Data Dictionary notifications	48
Table 2. 27 Data Dictionary payslips.....	49
Table 2. 28 sessions.....	49
Table 2. 29 Spesification testing	61
Table 3. 1 Alternative Solutions Comparison	70
Table 3. 2 Rubrics	72
Table 3. 3 Qualitative Solution Selection (Alternative Solution 1).....	74
Table 3. 4 Qualitative Solution Selection (Alternative Solution 2).....	75
Table 3. 5 Qualitative Solution Selection (Alternative Solution 3).....	76
Table 3. 6 Verification Demonstration And Proof Of Design Process.....	101
Table 3. 7 Standards Used.....	106
Table 3. 8 S-Charts.....	108
Table 4. 1 Implementation Verification.....	171
Table 4. 2 Component Cost Analysis	179
Table 5. 1 Restate User Characteristics.....	219
Table 5. 2 Functional Testing Payroll	224
Table 5. 3 Functional Testing Security.....	225
Table 5. 4 Functional Testing Attendance.....	226
Table 5. 5 Testing in Input Leave Request	228
Table 5. 6 Testing in View Leave Request Status.....	229

Table 5. 7 Testing in View and download Payslips report	229
Table 5. 8 Testing in Update Profile Photo	230
Table 5. 16 Testing in Edit User Password	231
Table 5. 17 Testing in View Login Activity and download report.....	231
Table 5. 18 Testing in Process and Store Data	232
Table 5. 19 Testing in Multiple Users	233
Table 5. 20 Testing in Accessible through various Device	235
Table 5. 21 Non-functional specifications from part C F200	240
Table 5. 22 Non-functional specifications from part C F200	240
Table 5. 23 Non-functional specifications from part C F200	241
Table 5. 24 Non-functional specifications from part C F200	241
Table 5. 25 Non-functional specifications from part C F200	242

LIST OF FIGURES

Figure 2. 1 Existing Business Process Payroll Diagram	22
Figure 2. 2 Existing Business Process Leave Request Diagram	23
Figure 2. 3 Proposed Business Process Payroll Diagram.....	25
Figure 2. 4 Proposed Business Process Leave Request Diagram	26
Figure 2. 5 Functional Description Use Case Diagram.....	34
Figure 2. 6 Data Requirement From User's Perspective ERD.....	39
Figure 2. 7 Functional Requirement from user's perspective Context Diagram	50
Figure 2. 8 Functional Requirement Activity Diagram Input Leave Request	51
Figure 2. 9 Functional Requirement Activity Diagram View Leave Request Status.....	52
Figure 2. 10 Functional Requirement Activity Diagram View and Download Payslips	53
Figure 2. 11 Functional Requirement Activity Diagram Update Profile Photo.....	54
Figure 2. 19 Functional Requirement Activity Diagram Edit user Password	55
Figure 2. 20 Functional Requirement Activity Diagram view Login Activity and download the report.....	56
Figure 2. 21 Functional Requirement DFD Input Leave Request	57
Figure 2. 22 Functional Requirement DFD View Leave Request.....	57
Figure 2. 23 Functional Requirement DFD View and Download Payslips Report	57
Figure 2. 24 Functional Requirement DFD Update Profile Photo.....	58
Figure 2. 40 Functional Requirement from user's perspective DFD Edit User Password	58
Figure 2. 41 Functional Requirement DFD View Login Activity and Download report	59
Figure 3. 1 Alternative Solution 1 Block Diagram Level 1	63
Figure 3. 2 Alternative Solution 2 Block Diagram Level 0	65
Figure 3. 3 Alternative Solution 2 Block Diagram Level	66
Figure 3. 4 Alternative Solution 3 Block Diagram Level 1	68
Figure 3. 5 DFD of Input Leave Request	78
Figure 3. 6 DFD of View Leave Request Status	78
Figure 3. 7 DFD of View and Download Payslips Report	79
Figure 3. 8 DFD of Update Profile Photo.....	79
Figure 3. 24 DFD of Edit User Password	80
Figure 3. 25 DFD of View Login Activity and Download Report	80
Figure 3. 26 UML Use Case Diagram	89
Figure 3. 27 UML Input Leave Request	90
Figure 3. 28 UML View Leave Request Status	91
Figure 3. 29 UML View and Download Payslips Report	92
Figure 3. 30 UML Update Profile Photo.....	93
Figure 3. 38 UML Edit User Password.....	94
Figure 3. 39 UML View Login Activity and Download the Report	95
Figure 3. 40 Sequence Diagram Input Leave Request.....	96
Figure 3. 41 Sequence Diagram View Leave Request.....	96
Figure 3. 42 Sequence Diagram View and Download Payslips Report.....	97
Figure 3. 43Figure 3. 31 Sequence Diagram Update Profile Photo.....	97
Figure 3. 51 Sequence Diagram Edit User Password	98
Figure 3. 52 Sequence Diagram View and Download Payroll Report All Employee	98
Figure 3. 53 UML Class Diagram.....	99
Figure 3. 54 UML Entity Relationship Diagram	100
Figure 3. 55 Grantt Chart	107
Figure 4. 1 DFD Input Leave Request	109
Figure 4. 2 DFD View Leave Request status	115
Figure 4. 3 DFD View and download Payslips report.....	118
Figure 4. 4 DFD Update Profile Photo.....	125

Figure 4. 20 DFD Edit User Password	127
Figure 4. 21 DFD View Login Activity and Download Report	131
Figure 4. 22 Database Attendance	139
Figure 4. 23 Database Employees.....	141
Figure 4. 24 Database Leave Requests	143
Figure 4. 25 Database Login Activity	144
Figure 4. 26 Database Notifications.....	146
Figure 4. 27 Database Payslips	148
Figure 4. 28 Database Users	149
Figure 4. 29 Database holiday	150
Figure 4. 30 Database Password history	151
Figure 4. 31 Database password resets	152
Figure 4. 32 Database position salary	153
Figure 4. 33 Database salary component templates	154
Figure 4. 34 Database salary components.....	155
Figure 4. 35 Database Salary history	156
Figure 4. 36 Database sessions	157
Figure 4. 37 Input Leave Request	158
Figure 4. 38 View Leave Request Status	159
Figure 4. 39 View and Download Payslips report	159
Figure 4. 40 Update Profile Photo	160
Figure 4. 56 Edit User Password.....	160
Figure 4. 57 View Login Activity and Download report	161
Figure 4. 58 Integration Routes	162
Figure 4. 59 Figure Integration Login.....	163
Figure 4. 60 Integration Find User.....	164
Figure 4. 61 Integration Session Token	165
Figure 4. 62 Integration Forget Password.....	166
Figure 4. 63 Integration Verification Code.....	167
Figure 4. 64 Integration Reset Password	168
Figure 4. 65 Logout.....	169
Figure 4. 66 Neon postgresQL Integration	170
Figure 4. 67 Login Page PULSE-HR.....	173
Figure 4. 68 Dashboard Page PULSE-HR.....	174
Figure 4. 69 Leave Request Page PULSE-HR.....	175
Figure 4. 70 Payslip Page and Payroll Report PULSE-HR	176
Figure 4. 71 Employee Management and Attendance Reports Page	177
Figure 4. 72 User Management and Login Activity Page.....	178
Figure 5. 1 Restate Use Case Diagram.....	227
Figure 5. 2 Proof of UAT.....	239
Figure 5. 3 Photo of Input Leave Request	243
Figure 5. 4 Photo of View Leave Request Status.....	244
Figure 5. 5 Photo of View and Download Payslips Report	245
Figure 5. 6 Photo of Update Profile Photo	246
Figure 5. 14 Photo of Edit User Password	247
Figure 5. 15 Photo of View Login Activity and Download Report.....	248