



WEB BASED APPLICATION TO MONITOR OVERALL EQUIPMENT EFFECTIVENESS (OEE)

Submitted as one of the requirements to obtain
Sarjana Komputer (S.kom)

By

IBNU ATHAILAH
001201800119

Faculty of Computing
Informatics

Cikarang, Bekasi, Indonesia

August 2024

PLAGIARISM CHECK RESULT

Turnitin Originality Report

Processed on: 09-Aug-2024 02:15 WIB
ID: 2428949660
Word Count: 9545
Submitted: 1

WEB BASED APPLICATION TO MONITOR
OVERALL EQUIPMENT EFFECTIVENESS
(OEE)_001201800119.docx By Ibnu Athallah

Similarity Index	Similarity by Source
11%	Internet Sources: 12% Publications: 1% Student Papers: 12%

2% match (student papers from 06-Mar-2023)
[Submitted to President University on 2023-03-06](#)

2% match (Internet from 01-Jan-2024)
["Overall equipment effectiveness". Wikipedia, en, 2024](#)

1% match (student papers from 04-May-2023)
[Submitted to President University on 2023-05-04](#)

1% match (student papers from 11-Apr-2023)
[Submitted to President University on 2023-04-11](#)

1% match (student papers from 19-May-2022)
[Submitted to President University on 2022-05-19](#)

1% match (student papers from 06-Jun-2024)
[Submitted to President University on 2024-06-06](#)

1% match (Internet from 11-Dec-2021)
<http://repository.president.ac.id/bitstream/handle/123456789/3564/Thesis%20%282%29.pdf?isAllowed=y&sequence=1>

1% match (Internet from 22-Nov-2021)
<http://repository.president.ac.id/bitstream/handle/123456789/3561/Thesis%20-%20Library.pdf?isAllowed=y&sequence=1>

1% match (Internet from 05-Feb-2023)
<https://ojs.umsida.ac.id/>

1% match (Internet from 14-Mar-2024)
https://wikimili.com/en/Drizzle_%28database_server%29

WEB BASED APPLICATION TO MONITOR OVERALL EQUIPMENT EFFECTIVENESS (OEE) By IBNU ATHALLAH 001201800119 [A Final Project Submitted to the Faculty of Computing President University In Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Informatics Cibirang, Bekasi, Indonesia](#) October 2024 Copyright By IBNU ATHALLAH 2024 WEB BASED APPLICATION TO MONITOR OVERALL EQUIPMENT EFFECTIVENESS (OEE) By IBNU ATHALLAH 001201800119 Approved: Cutita Safitri, Ph.D Cutita Safitri, Ph.D Thesis Advisor Program Head of Informatics Ir. Rila Mandala, M.Eng., Ph.D., Dean of Faculty of Computing STATEMENT OF ORIGINALITY In my capacity as an active student at President University and as the author of the final project titled "Web Based Application To Monitor Overall Equipment Effectiveness (OEE)" I hereby declare that the content of this document is my original work and has not been plagiarized from any other source.

AI CHECK RESULT

Report generated by  **GPTZero**

Version 2024-08-02-base

Document Title: **Document — 8/9/2024**

Author: **ATHA**

Our detector is highly uncertain about this document. The writing style and content are not particularly AI-like.

AI Scan

Stats

12%

708 words

83 sentences

0 sentences generated by AI

There is a 12% chance this text was written entirely by AI.

FAQ

What is GPTZero?

GPTZero is the leading AI detector for checking whether a document was written by a large language model such as ChatGPT. GPTZero detects AI on sentence, paragraph, and document level. Our model was trained on a large, diverse corpus of human-written and AI-generated text, with a focus on English prose. To date, GPTZero has served over 2.5 million users around the world, and works with over 100 organizations in education, hiring, publishing, legal, and more.

When should I use GPTZero?

Our users have seen the use of AI-generated text proliferate into education, certification, hiring and recruitment, social writing platforms, disinformation, and beyond. We've created GPTZero as a tool to highlight the possible use of AI in writing text. In particular, we focus on classifying AI use in prose. Overall, our classifier is intended to be used to flag situations in which a conversation can be started (for example, between educators and students) to drive further inquiry and spread awareness of the risks of using AI in written work.

Does GPTZero only detect ChatGPT outputs?

No, GPTZero works robustly across a range of AI language models, including but not limited to ChatGPT, GPT-4, GPT-3, GPT-2, LLaMA, and AI services based on those models.

What are the limitations of the classifier?

The nature of AI-generated content is changing constantly. As such, these results should not be used to punish students. We recommend educators to use our behind-the-scenes [Writing Reports](#) as part of a holistic assessment of student work. There always exist edge cases with both instances where AI is classified as human, and human is classified as AI. Instead, we recommend educators take approaches that give students the opportunity to demonstrate their understanding in a controlled environment and craft assignments that cannot be solved with AI. Our classifier is not trained to identify AI-generated text after it has been heavily modified after generation (although we estimate this is a minority of the uses for AI-generation at the moment). Currently, our classifier can sometimes flag other machine-generated or highly procedural text as AI-generated, and as such, should be used on more descriptive portions of text.

I'm an educator who has found AI-generated text by my students. What do I do?

Firstly, at GPTZero, we don't believe that any AI detector is perfect. There always exist edge cases with both instances where AI is classified as human, and human is classified as AI. Nonetheless, we recommend that educators can do the following when they get a positive detection:

Ask students to demonstrate their understanding in a controlled environment, whether that is through an in-person assessment, or through an editor that can track their edit history (for instance, using our [Writing Reports](#) through Google Docs). Check out our list of [several recommendations](#) on types of assignments that are difficult to solve with AI. Ask the student if they can produce artifacts of their writing process, whether it is drafts, revision histories, or brainstorming notes. For example, if the editor they used to write the text has an edit history (such as Google Docs), and it was typed out with several edits over a reasonable period of time, it is likely the student work is authentic. You can use GPTZero's Writing Reports to replay the student's writing process, and view signals that indicate the authenticity of the work.

See if there is a history of AI-generated text in the student's work. We recommend looking for a long-term pattern of AI use, as opposed to a single instance, in order to determine whether the student is using AI.

AI Scanned Document

Our detector is highly uncertain about this document. The writing style and content are not particularly AI-like.

AI Content

Document — 8/9/2024

WEB BASED APPLICATION TO MONITOR OVERALL EQUIPMENT EFFECTIVENESS (OEE)

By

IBNU ATHAILAH

001201800119

A Final Project

Submitted to the Faculty of Computing

President University

In Partial Fulfillment of the Requirements

for the Degree of Bachelor of Science

in Informatics

Gikarang, Bekasi, Indonesia

October 2024

Copyright By

IBNU ATHAILAH

2024

WEB BASED APPLICATION TO MONITOR OVERALL EQUIPMENT EFFECTIVENESS (OEE)

By

IBNU ATHAILAH

001201800119

Approved:

Cutifa Safitri, Ph.D

Thesis Advisor

Cutifa Safitri, Ph.D

Program Head of Informatics

Ir. Rila Mandala, M.Eng., Ph.D.

Dean of Faculty of Computing

STATEMENT OF ORIGINALITY

In my capacity as an active student at President University and as the author of the final project stated below:

Name: IBNU ATHAILAH

Student ID number: 001201800119

Study Program: Informatics

Faculty: Computer Science

I hereby declare that my final project entitled "WEB BASED APPLICATION TO MONITOR OVERALL EQUIPMENT EFFECTIVENESS" is to the best of my knowledge and belief, an original piece of work based on sound academic principles. If there is any plagiarism detected in this final project, I am willing to be personally responsible for the consequences of these acts of plagiarism and will accept the sanctions against these acts in accordance with the rules and policies of President University.

I also declare that this work, either in whole or in part, has not been submitted to another university to obtain a degree.

Cikarang, 2024

IBNU ATHAILAH

SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST

As an academic community member of the President's University, I, the undersigned:

Name: IBNU ATHAILAH

Student ID number: 001201800119

Study program: Informatics

for the purpose of development of science and technology, certify, and approve to give President University a non-exclusive royalty-free right upon my final report with the title:

"WEB BASED APPLICATION TO MONITOR OVERALL EQUIPMENT EFFECTIVENESS"

With this non-exclusive royalty-free right, President University is entitled to converse, to convert, to manage in a database, to maintain, and to publish my final report. There are to be done with the obligation from President University to mention my name as the copyright owner of my final report.

This statement I made in truth.

Cikarang, 2024

Ibnu Athailah

ADVISOR APPROVAL FOR JOURNAL/INSTITUTION'S REPOSITORY

As an academic community member of the President's University, I, the undersigned:

Name: Cutifa Safitri

ID number: 20190900815

Study program: Informatics

Faculty: Computing

declare that following thesis:

Title of thesis: WEB BASED APPLICATION TO MONITOR OVERALL EQUIPMENT EFFECTIVENESS

Thesis author: IBNU ATHAILAH

Student ID number: 001201900119

will be published in journal /institution's repository / proceeding / unpublished.

Cikarang, 2024

Cutifa Safitri

PLAGIARISM CHECK RESULT

ABSTRACT

Goal:

In this final project a technological approach for monitoring overall engine effectiveness is reviewed. Using Web technologies as a monitoring tool allowing this system able to be monitored everywhere as long the device supports web browsing capabilities. Furthermore, with extra additional hardware this system can also work as a remote to start and stop the selected engine.

Benefit:

The proposed work aims to facilitate the straightforward calculation of daily machine or engine availability, performance, quality, and Overall Equipment Effectiveness (OEE) values, which will subsequently be displayed on a web-based dashboard for easy monitoring and daily reporting. By implementing this system, organizations can gain real-time insights into their operational efficiency, allowing them to identify trends and patterns that affect productivity. The dashboard will serve as a centralized platform where users can access critical metrics at a glance, enabling quick assessments of machine performance and immediate recognition of any issues that may arise.

Additionally, this approach not only streamlines the reporting process but also enhances decision-making capabilities by providing comprehensive data analysis. With accurate calculations of availability, performance, and quality, companies can pinpoint inefficiencies and areas for improvement, ultimately leading to reduced downtime and optimized production processes. The visibility offered by the web-based dashboard empowers teams to respond promptly to any production challenges, fostering a proactive maintenance culture that minimizes disruptions. Overall, this method enhances operational transparency and drives continuous improvement, contributing to better resource management and increased profitability in the long run.

Method tidak sama dengan Tools

The approach utilized to achieve the project goal is not the same as Lakho, T.H., Khan, M. A., Virk, S. I., & Indher, A. A. (2020, December). Implementation of Overall Equipment Effectiveness (OEE) in Maintenance Management. In Proceedings of the I

ABSTRACT

Goal:

In this final project a technological approach for monitoring overall engine effectiveness is reviewed. Using Web technologies as a monitoring tool allowing this system able to be monitored everywhere as long the device supports web browsing capabilities. Furthermore, with extra additional hardware this system can also work as a remote to start and stop the selected engine.

Benefit:

The proposed work aims to facilitate the straightforward calculation of daily machine or engine availability, performance, quality, and Overall Equipment Effectiveness (OEE) values, which will subsequently be displayed on a web-based dashboard for easy monitoring and daily reporting. By implementing this system, organizations can gain real-time insights into their operational efficiency, allowing them to identify trends and patterns that affect productivity. The dashboard will serve as a centralized platform where users can access critical metrics at a glance, enabling quick assessments of machine performance and immediate recognition of any issues that may arise.

Additionally, this approach not only streamlines the reporting process but also enhances decision-making capabilities by providing comprehensive data analysis. With accurate calculations of availability, performance, and quality, companies can pinpoint inefficiencies and areas for improvement, ultimately leading to reduced downtime and optimized production processes. The visibility offered by the web-based dashboard empowers teams to respond promptly to any production challenges, fostering a proactive maintenance culture that minimizes disruptions. Overall, this method enhances operational transparency and drives continuous improvement, contributing to better resource management and increased profitability in the long run.

Method tidak sama dengan Tools

The approach utilized to achieve the project goal is not the same as Lakho, T. H., Khan, M. A., Virk, S. I., & Indher, A. A. (2020, December). Implementation of Overall Equipment Effectiveness (OEE) in Maintenance Management. In Proceedings of the International Conference on Industrial Engineering and Operations Management (pp. 07-10). Which only discussed on how companies implemented OEE and how it benefits the company overall. In this final project report a method for implementing such system, what it can do, and how to improve them will be delve in much detail. However,

TABLE OF CONTENTS

ABSTRACT	1
DEDICATION	3
ACKNOWLEDGEMENT	4
TABLE OF CONTENTS	5
LIST OF FIGURES	11
CHAPTER I INTRODUCTION	11
1.1 Background	13
1.2 Problem Statement	14
1.3 Objectives	14
1.4 Scope and Limitations	14
1.4.1 Scope	14
1.4.2 Limitations	15
1.5 Project Methodology	15
1.6 Final Project Outline	15
CHAPTER II LITERATURE REVIEW	18
2.1 Overall Equipment Effectiveness	18
2.2 Feature Utilization	19
2.2.1 Vue	19
2.2.2 PostgreSQL	20
2.3 Remarks	20
CHAPTER III SYSTEM ANALYSIS	22
3.1 System Overview	22
3.2 Function Analysis	22
3.3 Use Case Diagram	23

3.4 Use Case Narrative	24
3.4.1 Use Case Narrative for Access Login page and logon to the application	25
3.4.2 Use Case Narrative for allowing user to manage equipment data	26
3.4.3 Use Case Narrative for allowing user to manage equipment data	28
3.4.4 Use Case Narrative for allowing user to manage production item	30
3.4.5 Use Case Narrative for allowing user to plan and generate equipment schedules	31
3.4.6 Use Case Narrative for allowing user to view equipment status, process, and performance	32
3.4.7 Use Case Narrative for allowing user to view equipment overall equipment effectiveness value (OEE) and other supporting values trend in real-time.	33
3.4.8 Use Case Narrative for allowing user to view equipment reports and alerts.	34
3.4.9 Use Case Narrative for allowing user to generate report in excel format	36
3.5 Swim Lane Diagram	37
3.5.1 Swim Lane Diagram for Allowing User to login with their own credentials.	37
3.5.2 Swim Lane Diagram for Allowing Admin and Superadmin to Manage Equipment Data.	39
3.5.3 Swim Lane Diagram for Allowing Admin and Superadmin to manage production item.	39
3.5.4 Swim Lane Diagram for Allowing Admin and Superadmin to manage user data.	40
3.5.5 Swim Lane Diagram for Allowing Admin and Superadmin to plan and generate equipment schedules.	41
3.5.6 Swim Lane Diagram for Allowing User to view equipment status, process, and performance.	42
3.5.7 Swim Lane Diagram for Allowing User to view equipment OEE and other values trend in real-time.....	43
3.5.8 Swim Lane Diagram for Allowing User to view equipment reports and alerts.	44

3.6	Hardware and Software Requirement	44
3.6.1	Hardware Requirement	45
3.6.2	Software Requirement	45
	CHAPTER IV SYSTEM DESIGN	46
4.1	User Interface Design	46
4.1.1	Master Data Items Page.....	47
4.1.2	Master Data Machine Page	48
4.1.3	Master Data Time Schedule Page	49
4.1.4	Master Data Machine Calendar Page	50
4.1.5	Master Data Role Page	51
4.1.6	Master Data User Page	52
4.1.7	Master Data Menus & Submenus page	53
4.1.8	Production Order Downtime Page	54
4.1.9	OEE Plant Overview Page	55
4.1.10	Availability Analysis by Machine Page	56
4.1.11	OEE Trend Page	57
4.1.12	Realtime Individual Machine Monitoring Page	58
4.1.13	Performance Quality Analysis Page	59
4.1.14	Alarm Code Trend Page	60
4.1.15	Event Record Trend Page	61
4.2	Class Diagram	62
	CHAPTER V SYSTEM IMPLEMENTATION	63
5.1	User Interface	63
5.1.1	Master Data Items Page.....	63
5.1.2	Master Data machine Page	64
5.1.3	Master Data Time Schedule Page	65
5.1.4	Master Data Machine Calendar Page	66

5.1.5	Master Data Role Page	67
5.1.6	Master Data User Page	68
5.1.7	Master Data Menus & Submenus page	69
5.1.8	Production Order Downtime Page	70
5.1.9	OEE Plant Overview Page	71
5.1.10	Availability Analysis by Machine Page	72
5.1.11	OEE Trend Page	73
5.1.12	Realtime Individual Machine Monitoring Page	74
5.1.13	Performance Quality Analysis Page	75
5.1.14	Alarm Code Trend Page	76
5.1.15	Event Record Trend Page	77
CHAPTER VI SYSTEM TESTING		78
6.1	Testing Environment	78
6.2	Testing Scenario	79
6.3	Testing Summary	80
CHAPTER VII CONCLUSION AND FUTURE WORKS		81
7.1	Conclusion	81
7.2	Future Works	81
REFERENCES		82

LIST OF TABLES

Table 3.1 Table of Function Description	23
Table 3.2 Use Case Narrative for “Access Login Page and login to the application” Use Case.....	25
..... 26	
Table 3.3 Use Case Narrative for “Allow User to manage equipment data”	
Table 3.4 Use Case Narrative for “Allow user to manage user data”	28
Table 3.5 Use Case Narrative for “Allow User to manage production Item”	30
Table 3.6 Use Case Narrative for “Allow User to plan and generate equipment schedules”	31
Table 3.7 Use Case Narrative for “Allow User to view equipment status, process, and performance”	32
Table 3.8 Use Case Narrative for “Allow User to view equipment overall equipment effectiveness value (OEE) and other supporting values trend in real-time”	33
Table 3.9 Table 3.10 Use Case Narrative for “Allow User to view equipment reports and alerts”	35
Table 3.11 Use Case Narrative for “Allow User to generate report in excel format” .	36
Table 4.1 Table Description from figure 4.1	47
Table 4.2 Table Description from figure 4.2	48
Table 4.3 Table Description from figure 4.3	49
Table 4.4 Table Description from figure 4.4	50
Table 4.5 Table Description from figure 4.5	51
Table 4.6 Table Description from figure 4.6	52
Table 4.7 Table Description from figure 4.7	53
Table 4.8 Table Description from figure 4.8	54
Table 4.9 Table Description from figure 4.9	55
Table 4.10 Table Description from figure 4.10	56
Table 4.11 Table Description from figure 4.11	57
Table 4.12 Table Description from figure 4.12	58
Table 4.13 Table Description from figure 4.13	59
Table 4.14 Table Description from figure 4.14	60
Table 4.15 Table Description from figure 4.15	61
Table 5.1 Table Description for figure 5.1	64
Table 5.2 Table Description for figure 5.2	64

Table 5.3 Table Description for figure 5.3	65
Table 5.4 Table Description for figure 5.4	66
Table 5.5 Table Description for figure 5.5	67
Table 5.6 Table Description for figure 5.6	68
Table 5.7 Table Description for figure 5.7	69
Table 5.8 Table Description for figure 5.8	70
Table 5.9 Table Description for figure 5.9	71
Table 5.10 Table Description for figure 5.10	72
Table 5.11 Table Description for figure 5.11	73
Table 5.12 Table Description for figure 5.12	74
Table 5.13 Table Description for figure 5.13	75
Table 5.14 Table Description for figure 5.14	76
Table 5.15 Table Description for figure 5.15	77

LIST OF FIGURES

Figure 2.1 Overall Equipment Effectiveness (OEE) Formula	18
Figure 3.1 Use Case Diagram	24
Figure 3.2 Swimlane diagram for Allowing User to login with their own credentials	38
Figure 3.3 Swimlane diagram for Allowing Admin and Superadmin to Manage Equipment Data	39
Figure 3.4 Swimlane diagram for Allowing Admin and Superadmin to manage production item	40
Figure 3.5 Swimlane Diagram for Allowing Admin and Superadmin to manage user data.	41
Figure 3.6 Swimlane Diagram for Allowing Admin and Superadmin to plan and generate equipment schedules.....	42
Figure 3.7 Swimlane Diagram for Allowing User to view equipment status, process, and performance.....	43
Figure 3.8 Swimlane Diagram for Allowing User to view equipment OEE and other values trend in real-time.....	43
Figure 3.9 Swimlane Diagram for Allowing User to view equipment reports and alerts	44
Figure 4.1 Master Data Items Page Wireframe	47
Figure 4.2 Master Data Machine Page Wireframe	48
Figure 4.3 Master Data Time Schedule Page Wireframe	49
Figure 4.4 Master Data Machine Calendar Page Wireframe	50
Figure 4.5 Master Data Items Page Wireframe	51
Figure 4.6 Master Data User Page Wireframe	52
Figure 4.7 Master Data Menus & Submenus Page Wireframe	53
Figure 4.8 Production Order Downtime Page Wireframe	54
Figure 4.9 OEE Plant Overview Page Wireframe	55
Figure 4.10 Availability Analysis by Machine Page Wireframe	56
Figure 4.11 OEE Trend Page Wireframe	57
Figure 4.12 Realtime Individual Machine Monitoring Page Wireframe	58
Figure 4.13 Performance Quality Analysis Page Wireframe.....	59
Figure 4.14 Alarm Code Trend Page Wireframe	60
Figure 4.15 Event Record Trend Page Wireframe	61

Figure 4.16 Class Diagram for the application	62
Figure 5.1 Final UI of Master Data Items Page	63
Figure 5.2 Final UI of Master Data Machine Page	64
Figure 5.3 Final UI of Master Data Time Schedule Page	65
Figure 5.4 Final UI of Master Data Time Schedule Page	66
Figure 5.5 Final UI of Master Data Role Page	67
Figure 5.6 Final UI of Master Data User Page	68
Figure 5.7 Final UI of Master Data Menus & Submenus Page	69
Figure 5.8 Final UI of Production Order Downtime Page	70
Figure 5.9 Final UI of OEE Plant Overview Page	71
Figure 5.10 Final UI of Availability Analysis by Machine Page	72
Figure 5.11 Final UI of OEE Trend Page	73
Figure 5.12 Final UI of Realtime Individual Machine Monitoring Page	74
Figure 5.13 Final UI of Performance Quality Analysis Page	75
Figure 5.14 Final UI of Alarm Code Trend Page	76
Figure 5.15 Final UI of Event Record Trend Page	77