**TECHNICAL SPECIFICATIONS**



**YOUR LOGO**

**TECHNICAL SPECIFICATIONS:  
NIGHTCOREMECH**

**DEVELOPMENT TEAM**

**12/09/2022**

**Version 1.0.0**

| REVISION HISTORY | | | |
| --- | --- | --- | --- |
| DATE | VERSION | DESCRIPTION | AUTHOR |
| 08/09/2022 | 1 | First Draft | Development Team |
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**Technical Specifications Document**

**Authorization Memorandum**

**I have carefully assessed the Technical Specifications Document for the SimiLabs Plagiarism/Stylometry Checker.**

**MANAGEMENT CERTIFICATION - Please check the appropriate statement.**

**\_\_\_\_\_\_ The document is accepted.**

**\_\_\_\_\_\_ The document is accepted pending the changes noted.**

**\_\_\_\_\_\_ The document is not accepted.**

**We fully accept the changes as needed improvements and authorize initiation of work to proceed. Based on our authority and judgment, the continued operation of this system is authorized.**

**Ricus Warmenhoven 2022/09/12**

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**NAME DATE**

**Project Manager**

**NWU Registrar 2022/09/12**

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# INTRODUCTION

## PURPOSE

Several administrative duties are the responsibility of the Registrar at North-West University. Keeping track of university students' grades and a wide range of other supporting records and documentation are among these duties. In accordance with Gartner's definition of information governance, the university sees it as an all-encompassing framework that gives control over information and the procedures by which it is created, processed, and curated at the institution.

The current demands from the client (the NWU Registrar), with Mr. Zander Janse van Rensburg serving as the project managing manager, require our company to design and construct a modular workflow system that would assist academic lecturers in identifying and reporting cases of academic misconduct in accordance with the NWU SOPS.

To combat contract cheating, the NWU Registrar must assess each instance separately and employ specialists to provide technical reports. If the technical reports do not self-evidently emphasize the severity of the plagiarism, external subject matter experts (SMEs) are asked to review the technical reports with an additional report that offers a deeper understanding of the suspected plagiarism. The technical need is to manually compare the allegedly plagiarized text in question with the original text used as evidence. The registrar also needs to identify authorship attribution, via the use of stylometry to generate reports. It is rather difficult to manually compare text, so the Registrar encouraged the NightcoreMech development team to develop a system that can automatically detect text comparisons and authorship attribution without the need to manually compare documents.

## INTENDED AUDIENCE AND PERTINENT SECTIONS

The client, developers, and project managers are the targeted users of this document.

Client: The client is viewed as the most crucial stakeholder of the project and pays for the services provided by NightcoreMech, as stated in the tender document. As a result, the client will be at the centre of the development processes to ensure that client satisfaction is a top priority. The technical specification document is highly significant to the client since no changes can be made to the document once it has been signed by the client.

Developers: The developers are responsible for developing and testing the software requested by the client. This document will specify the various requirements that the development team will need to satisfy to ensure client satisfaction. The development team will utilise this document as a guideline during development to ensure that all specifications and requirements are met.

Projects Managers: The project managers are the second biggest stakeholders in the project and are responsible for managing and directing the development team in an efficient and effective manner to ensure that the project is completed on time and within scope.

## PROJECT SCOPE

The proposed system will provide users with an easy to ease interface for submitting and analysing student assignments in the form of documents. Users will have the ability to select between two text comparison methods namely quick and extensive. The quick comparison allows users to submit two documents for comparison and the ability to select an algorithm which will be used during comparison. Subsequently, the application will display both submitted documents together and highlight the similarities. The extensive comparison will provide the end-user with the ability to select a corpus to which the uploaded document will be compared. The corpus will contain a collection of documents submitted by each of the end-users. The end-user can specify which documents to use in the corpus for comparison.

In addition, the end-user will be able to upload documents for stylometric analysis which will aid in authorship attribution, detection of contract cheating and analysis of student writing capabilities. The application will then compile a report containing the results of all the various analyses and comparisons that took place.

## REFERENCES

The client has access to the following documents which were submitted to them earlier in the development cycle:

• Tender document

• Business case

• Feasibility study

# DESCRIPTION

## PRODUCT PERSPECTIVE

The project sponsor, Mr Zander Janse van Rensburg, contacted Nightcore Mech to develop an application that can detect plagiarism and use stylometry to identify the author of a text. Nightcore Mech has successfully received the tender to design such an application and has completed a business case and feasibility study to ascertain the needs of the application.

The client had asked a different group to develop this application in the past, but the application did not meet the needs of the client.

## FEATURES

The following are the features that will be developed for the application:

Login page: Users will be able to register for an account that they can use to log in to the application.

Home page: The home page shows all available features of the application.

Text Compare: this feature compares two texts with one of two options.

• Quick: this is a direct comparison of two texts, which only shows exact matches of words.

• Extensive: this compares two texts based on similar words used, phrasing, and punctuation use.

Stylometry: this feature enables the user to upload a corpus of documents to detect the authorship of a different document using stylometric analysis.

Reports: This feature enables the user to generate reports that give an overview of the comparison or analysis the user did.

Help functionality: if a user has a question about how to use a feature, they can consult the help feature.

## USER OVERVIEW

The users of this application will be the client, lecturers at the North-West University, and employees of the academic integrity department of the North-West University.

## OPERATING ENVIRONMENT

The application will be written in Python for most operating systems and browsers. The app will not be accessible for mobile browsers.

## CONTRAINTS: IMPLEMENTATION / DESIGN

**Covid-19**

The Covid-19 pandemic has had a significant impact on businesses and the general public with various safety measures and regulations being introduced by the government. As a result, the development team will have to adhere to these rules and regulations during development. The current alert level allows for developers to meet in person with stakeholders and various other activities that take place in person. The development team continuously assess the Covid-19 alert level and will adjust accordingly to its changes.

**Time constraint**

This project has a set deadline with various deliverables spread out through the development cycle. The development team will strictly adhere to the proposed development schedule to ensure that the project is completed within the time frame.

**Budget constraint**

The project has a proposed budget which is strictly adhered to and continuously monitored by the development team. The budget has been constructed based on the scope and similar projects. If the scope changes during the development processes, the budget will be re-assessed and adjusted.

**Scope constraint**

The feasibility study and business case results and feedback are used to determine the project's scope. The primary goal of the development team will be to guarantee that all functionality specified in the scope is implemented. If stakeholders want to add more functionality to the project, the development team must first approve the request before it can be added to the project's scope and adjustments can be made to the budget and schedule.

## DOCUMENTATION

The project documentation has been completed following the MPMM standards. The following documentation has been completed:

• Tender response

• Feasibility study

• Business case

• Project plan

## ASSUMPTIONS / DEPENDENCIES

Nightcore Mech makes the following assumptions regarding the application:

• The users have the minimum required hardware and software needed to successfully access the application.

• The application’s intended use is as a tool to help detect plagiarism, but the application does not guarantee 100% accuracy.

# SYSTEM FEATURES

## Access control

|  |  |
| --- | --- |
| **DESCRIPTION AND PRIORITY** | The user needs to log in to the application every time it is used due to personal documents being accessed. |
| **STIMULUS / RESPONSE SEQUENCES** | A login screen will show when the application is launched, asking the user to input their information. |
| **FUNCTIONAL REQUIREMENTS** | The application will check the information, and if it is accurate, it will provide the user access to the application’s functions. |

## Text comparison

|  |  |
| --- | --- |
| **DESCRIPTION AND PRIORITY** | The comparison of two texts. |
| **STIMULUS / RESPONSE SEQUENCES** | The user will be required to upload two texts. One will be the evidence text, the other the suspected text. |
| **FUNCTIONAL REQUIREMENTS** | The application will compare the texts based on which option the user chose. The results will be given as a report that the user can download. |

## Stylometric analysis

|  |  |
| --- | --- |
| **DESCRIPTION AND PRIORITY** | Stylometric analysis of a text to determine the authorship. |
| **STIMULUS / RESPONSE SEQUENCES** | The user will be required to upload a text document and a corpus. |
| **FUNCTIONAL REQUIREMENTS** | The text will be analysed with the corpus to determine the author of the text. The results will be given as a report that the user can download. |

# REQUIREMENTS OF EXTERNAL INTERFACE

## USER INTERFACES

The user interface will consist of various pages developed in HTML and CSS. The different functionalities of the application will each have their own respective page. One of the main goals is to develop a user interface that allows end-users to complete their tasks effectively and efficiently. The user interface will thus be prototyped, and feedback will be taken into consideration.

## HARDWARE INTERFACES

Minimum computer hardware requirements:

1. OS: Windows 8/10/11

Recommended: Windows 10

2. CPU: Intel or AMD processor with 64-bit support;

Recommended: 3.0 GHz or faster processor

3. RAM: Minimum of 4 GB.

Recommended: 8 GB

4. Disk Storage: 2 GB of free disk space

5. Monitor Resolution: 1280x800;

Recommended: 1920x1080

The software can be accessed online via an internet browser. As a result, the application will not rely as heavily upon the end-user’s hardware as with locally installed software. End-users will be able to access the application at any time in any place that has access to an internet connection and a computer. The end-user will not be required to manage or use any of the hardware related to the application.

## SOFTWARE INTERFACES

End-users will be able to use any browser to access the application, as the application is developed to be accessible via common internet browser. The end-user will be able to upload the required documents via the website, which will then be stored locally on the user’s computer. The application will be developed using Flask for web framework implementation. Majority of the code will be written in Python, HTML and CSS. The database utilised will be a MySQL database. The application is responsible for managing the database and various other technical functions to allow the end-user to focus solely on their work.

## COMMUNICATION INTERFACES

End-users require a stable internet connection in order to access the application online. As a result, relevant security measures are put in place to ensure that the website and end-users are protected from any malicious intent. Additional security information will be discussed in the Non-Functional requirements section.

# ADDITIONAL NONFUNCTIONAL REQUIREMENTS

## PERFORMANCE

Performance requirements for the program include rapid reaction times, high throughput, and low usage. Where feasible, the user shall have a quick reaction time and transparent throughput. The application will free up resources that are not being used, increasing hardware underutilization. These elements will guarantee that the new software outperforms the existing program and generates a high-quality output that meets the demands of the customers.

## SAFETY

The website that will be built has security concerns since it will work in an online environment and secure communication channels will be utilized to connect to the online database. Security measures will be taken regarding keeping data safe and will only allow authorized access to the database.

## SECURITY

The website that will be built has security concerns since it will work in an online environment and secure communication channels will be utilized to connect to the online database. Security measures will be taken regarding keeping data safe and will only allow authorized access to the database.

## SOFTWARE QUALITY

Based on prior conversations, the program will offer a user interface that the user is accustomed to. Given knowledge of the technology, this user interface will be simple to use. The application’s goal is to deliver a good product that meets the user’s requirements as previously described.

The program will be as dependable and error-free as it can be. The website will be launched and will be able to run on any computer.

# APPENDICES

## APPENDIX A: GLOSSARY OF TERMS

HTML: Hypertext Markup Language

CSS: Cascading Style Sheets

MPMM: Method123 Project Management Methodology

## APPENDIX B: ANALYSIS DOCUMENTATION

No external documentation is used.

## APPENDIX C: ISSUES

| ISSUES | | |
| --- | --- | --- |
| ID | DESCRIPTION | PARTY RESPONSIBLE |
| 1 | The different avenues for storage and interaction with documents are still being researched to determine the best possible solution. | NIGHTCORE MECH |
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