**RESEARCH PLAN**

**P-TISTRY: A WORD PROCESSOR CONFIGURED FOR STUDENT PAPERS IN APA FORMAT**

Research papers often rely on the widely used APA format to ensure clarity, consistency, and professionalism. However, the complexity of APA guidelines presents significant challenges for students as they navigate its intricacies while also focusing on the substantive content of their work. Existing tools in the market address specific aspects, such as citation management and grammar checking, but they often fail to integrate these functions into a seamless writing and formatting experience. This fragmentation can lead to inefficiencies and distractions from the writing process itself. Recognizing these challenges, we propose P-Tistry as an all-in-one solution. P-Tistry aims to streamline the academic writing process by integrating citation management, statistical testing, and grammar checking into a single platform. This approach not only simplifies the formatting process but also enhances the overall writing experience, allowing students to concentrate more on their research and analysis. By addressing these gaps, P-Tistry promises to transform how students approach writing research papers, offering a comprehensive and user-friendly solution tailored to their needs.

**Statement of the Problem**

1. What is the average user experience of the users of the application in terms of usability?

2. What is the difference between the output of the research papers among the users of the application in terms of error rate?

3. Is there a correlation between the usability of P-Tistry and error rate on the research papers?

**Engineering goals**

This research aims to develop a word processor configured to assist students in creating academic papers, emphasizing consistent adherence to the APA format. The tool will automate complex formatting tasks, ensuring accuracy in citations, references, and document structure, thus reducing the cognitive load on students. By integrating user-friendly interfaces and intuitive design, the word processor will be accessible to users with varying technical skills. The ultimate goal is to enhance the writing process, enabling students to produce professionally formatted research papers with greater efficiency and ease with the use of this application.

**Expected outcome**

The expected outcome is the P-Tistry being able to analyze and improve the quality of the output of the research paper.

**Hypotheses**

There is no correlation between the usability of the application and the error rate incurred in research papers

There is no significant difference between the error rate incurred in research papers with or without utilization of the application.

**Procedure**

***Integrated Development Environments (IDE)***

The application will be programmed through the use of IDEs, including Visual Studio Code and PyCharm.

***Web Technologies***

The development of the website utilizes HTML for structuring content, CSS for styling and layout, and JavaScript for interactive functionality.

***Programming Languages***

These programming languages are crucial for running the application itself. These include C++ and Python.

***Frameworks and Libraries***

These frameworks provide a wide range of features and functionality that help streamline application development. These include React and Node.js, a component from JavaScript, and Bootstrap, a component of HTML and CSS, for web designing.

***Integration of Application Programming Interfaces***

To facilitate development and enhance functionality, several APIs will be integrated: the OpenAI API will provide AI-driven writing assistance; the Grammarly API will offer advanced grammar and style checking; the Firebase API will manage real-time databases and user authentication; the Stripe API will handle payment processing needs; and the Google Docs API will enable seamless document editing and collaboration features.

***Design and Architecture***

A user-friendly interface is designed to assist users in formatting papers and documents according to APA style. Subsequently, a robust database is integrated to manage user information effectively.

***Coding and Implementation***

Front-end technologies such as HTML, CSS, and JavaScript are utilized to develop a dynamic and responsive user interface. For back-end functionalities, C++ and Python are employed. Seamless integration is achieved with React and Node.js for server database management.

***Testing and Quality Assurance***

The application is assessed through various phases. Initially, unit tests are conducted to ensure each component functions correctly. Integration testing follows to verify seamless module interaction. Lastly, user satisfaction testing is carried out to gather feedback for essential adjustments.

***Deployment and Maintenance***

The application is deployed through a phased approach to incorporate feedback and make enhancements. Routine maintenance is scheduled for updates and bug fixes, and user support resources are provided to assist with any encountered issues.

***Pilot Testing***

The pilot testing phase will begin in mid-February to early March 2025 once P-Tistry's basic functionalities are developed. This phase will last two months to evaluate the application's functionality and usability. This study will continue in the second phase for the following school year, including all of the proposed features.

***Risk and safety***

The risks in cybersecurity and other forms of adversaries that may threaten the data, accounts of participants and researchers, and also the system of the app itself are factors the researchers will need to consider. To mitigate this, the researchers will plan to create robust measures in the application to mitigate the threat and ensure the safety of the participants' personal data.

**Data analysis**

After data collection in the proposed study, the Shapiro-Wilk test will first be employed to assess the data distribution, guiding the decision on whether to apply parametric or non-parametric tests. Subsequently, the data will be analyzed to address the research questions using the following statistical treatments:

***Measuring Usability Test Results***

Measures of central tendency, such as mean, median, and mode, will be used to analyze the results of the experimental group from the usability test.

***Measuring Error Rate***

Measures of central tendency, such as mean, median, and mode, will be used to analyze the error rate in research papers of the experimental group using the application.

***Correlation of Usability Test Results and Error Rate of Research Papers***

For parametric data, the Pearson correlation coefficient will be applied to test the correlation between usability test results and error rate of research papers in the experimental group. If the data is non-parametric, Spearman’s rank correlation coefficient will be used.

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