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Addict Aware: Mobile Phone Addiction

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ABSTRACT

Addict Aware is a web-based application designed to detect and analyze smartphone addiction using Artificial Intelligence (AI), Machine Learning (ML), and Natural Language Processing (NLP) techniques. The platform collects user data, including screen time, phone usage patterns, and self-reported behavioral inputs, to predict addiction levels using machine learning algorithms such as Support Vector Machines (SVM), Random Forest, and Neural Networks. The system categorizes users into different risk levels (low, moderate, and high) and provides personalized intervention strategies, including awareness suggestions and digital detox recommendations. By analyzing textual feedback and social media interactions through NLP, the system identifies emotional and psychological patterns associated with excessive smartphone usage. The proposed solution promotes mental health awareness and encourages healthier digital habits through intelligent monitoring and prediction.

Keywords *— Smartphone Addiction Detection, Machine Learning, Natural Language Processing, Behavioral Analysis, Addiction Prediction, Mental Health, User Behavior, Digital Detox*

INTRODUCTION

Mobile phone addiction has emerged as a significant concern due to its adverse effects on mental health, productivity, and daily life activities. Excessive smartphone usage leads to issues such as anxiety, reduced concentration, and social isolation. To address this problem, this project applies Artificial Intelligence (AI) techniques, including Support Vector Machines (SVM), Random Forest, and Neural Networks, to analyze smartphone usage patterns and self-reported behavioral data.

Natural Language Processing (NLP) is incorporated to examine textual feedback and social media interactions for identifying emotional indicators associated with addiction. The primary objective of this work is to detect signs of smartphone addiction, predict risk levels, and provide personalized intervention strategies. The proposed system demonstrates how machine learning can support mental health initiatives by increasing awareness and promoting responsible smartphone usage.

LITERATURE SURVEY

Mobile phone addiction has become a major concern in recent years due to its negative impact on mental health, productivity, and social interactions. Researchers have studied this issue from psychological, behavioral, and technological perspectives.

Studies show that excessive use of social networking services (SNS) and gaming applications among adolescents leads to addiction-like behaviors such as anxiety, poor self-control, and reduced academic performance. Reward-based features in mobile apps play a key role in increasing user dependency.

Research also highlights that smartphone addiction is influenced by factors like stress, depression, ADHD, and social issues. It is not just related to screen time but results from a combination of emotional, social, and environmental factors, indicating the need for behavior-based analysis systems.

Machine learning techniques such as Support Vector Machines, Random Forests, and Neural Networks have been widely used to predict addiction levels. Emotional factors like Fear of Missing Out (FoMO) further contribute to compulsive smartphone usage.

Although several AI-based systems improve detection accuracy, many lack personalized intervention features. Advanced methods like deep learning provide deeper insights but are complex for practical use.

To overcome these limitations, the proposed Addict Aware system uses machine learning and natural language processing to analyze both usage patterns and emotional behavior, offering accurate predictions and personalized interventions in a scalable and user-friendly manner.

PROPOSED METHODOLOGY

The Addict Aware system is designed using a client-server architecture, where the user interface collects smartphone usage data and the backend processes it to analyze addiction levels and generate insights.

A. **Front-End Technologies**

The front-end of the application is developed using HTML, CSS, and JavaScript, providing a simple and user-friendly interface. It allows users to enter their screen time, social media usage, and phone activity details. The interface also displays addiction scores, graphs, and personalized suggestions in an interactive manner.

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B. **Back-End Technologies**
The backend is implemented using Python with Flask, which handles data processing and communication between the front-end and database. Machine Learning algorithms such as Random Forest, are used to analyze user data and classify addiction levels (Low, Medium, High).

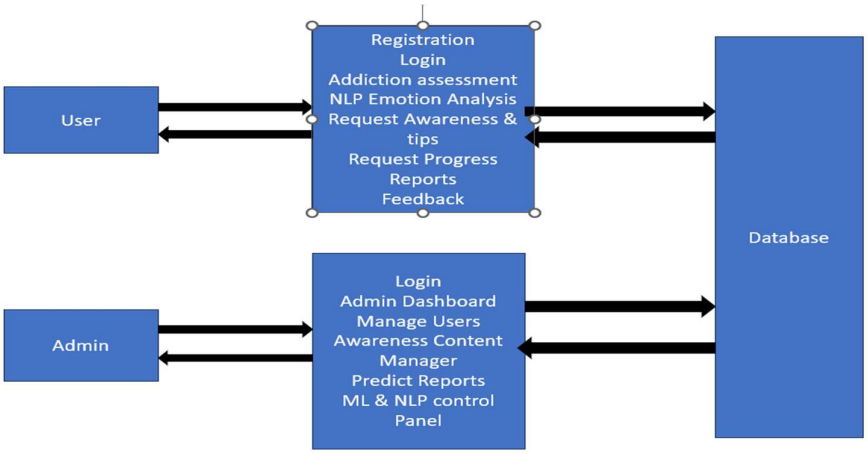
C. **AI & NLP Integration**
The system integrates Machine Learning and Natural Language Processing (NLP) techniques to enhance analysis. ML models are used to detect usage patterns and predict addiction risk, while NLP is applied to analyze user feedback and textual data to identify emotional and behavioral indicators related to addiction.

D. **Database**
The application uses MySQL as the database management system to store user details, usage data, addiction scores, and feedback. It ensures efficient data storage, retrieval, and consistency for large-scale usage.

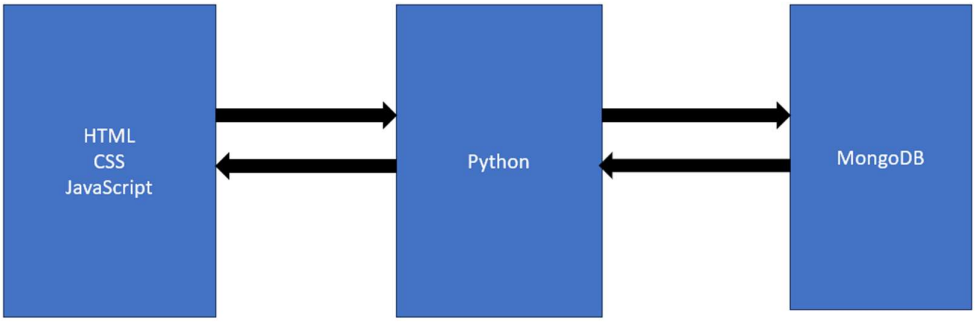
E. **Development Environment**
The development and testing of the Addict Aware system are carried out on a Windows operating system using tools such as VS Code, Jupyter Notebook, or PyCharm. These tools support efficient coding, model training, and system deployment.

Architecture
The Addict Aware system architecture consists of multiple modules, including user authentication, data collection, machine learning analysis, NLP processing, and recommendation generation. The user interface allows login, assessment submission, progress tracking, feedback submission, and health tips access. The admin panel manages user data and controls ML and NLP modules.
The technical architecture includes the frontend interface, Flask backend server, machine learning models, NLP processing unit, and MySQL database. These components interact to collect user data, process it, and generate predictions and recommendations.

System Architecture



Technical Architecture



The Addict Aware system was evaluated under different user scenarios to assess performance, usability, and prediction accuracy. The application successfully collected user inputs such as screen time, social media usage, and phone activity patterns

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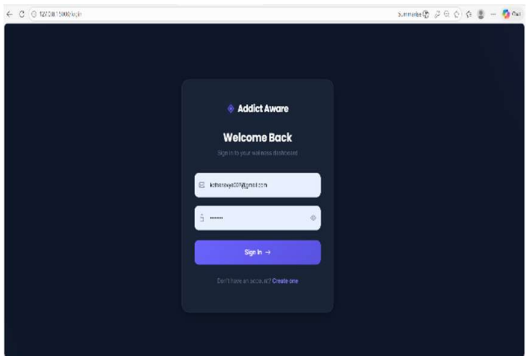
and processed this data efficiently to determine addiction levels.

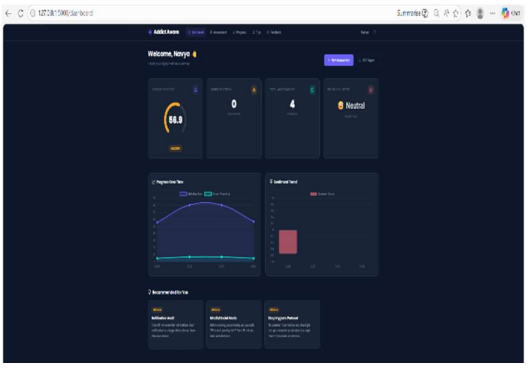
Machine learning algorithms including Support Vector Machines, Random Forest, and Neural Networks classified users into Low, Medium, and High addiction categories with reliable performance. The NLP module effectively analyzed user feedback to identify emotional and behavioral patterns associated with smartphone addiction.

The system generated visual outputs such as graphs and addiction scores, helping users understand their usage behavior. Personalized recommendations, including screen time alerts and digital detox suggestions, were provided. The system demonstrated good responsiveness, scalability, and usability, making it suitable for real-world deployment.

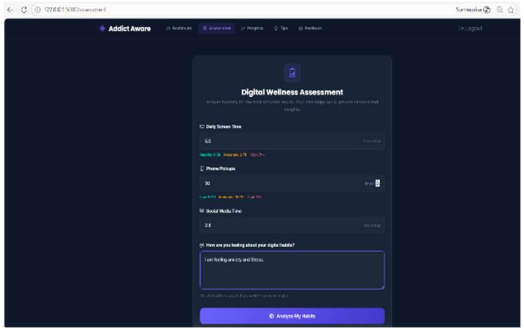
Screenshots



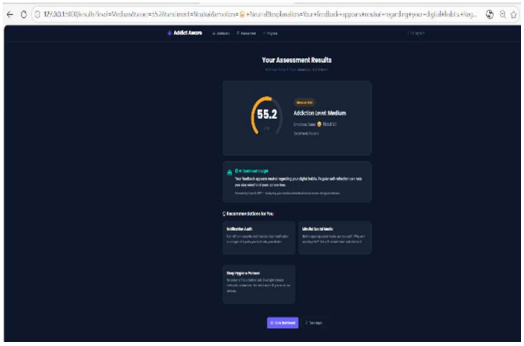
User Login



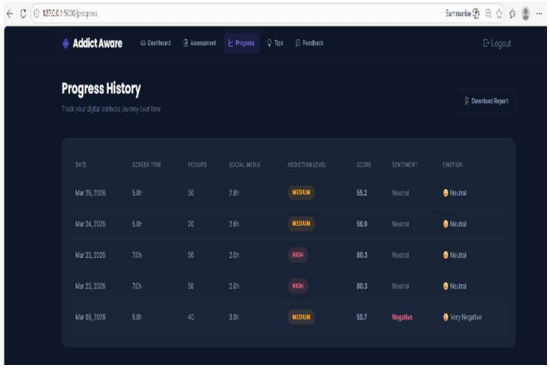
User Dashboard



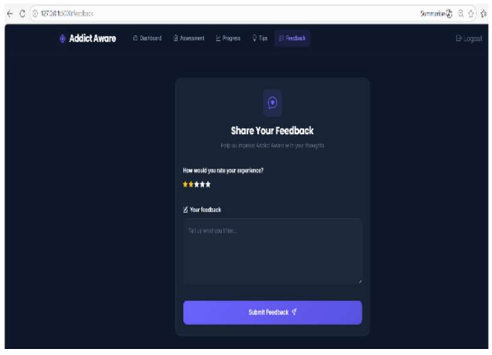
Assessment



Assessment Results



Give Feedback



Requesting Progress History

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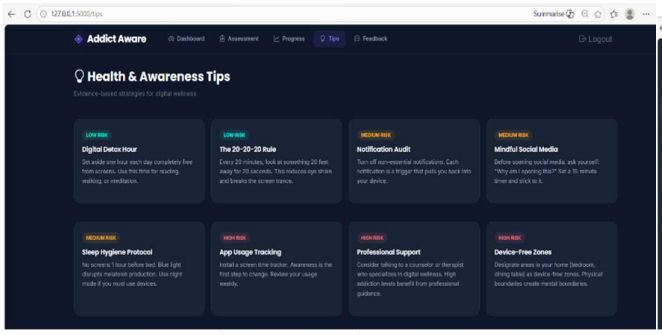
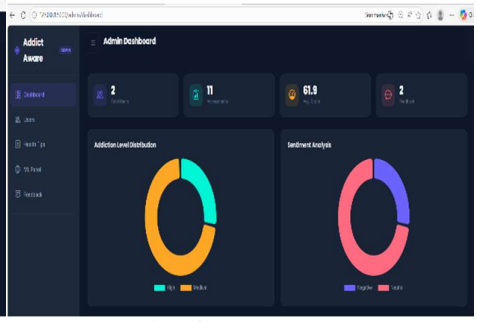
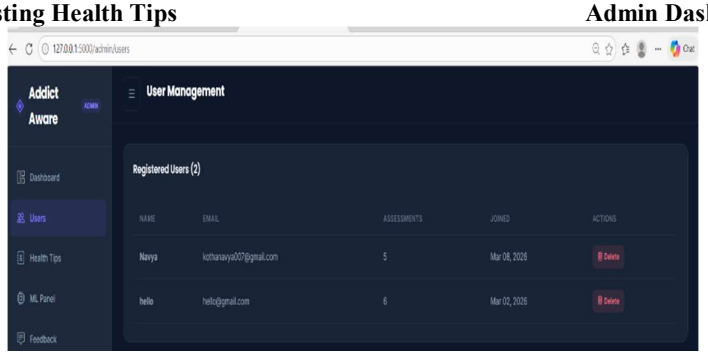


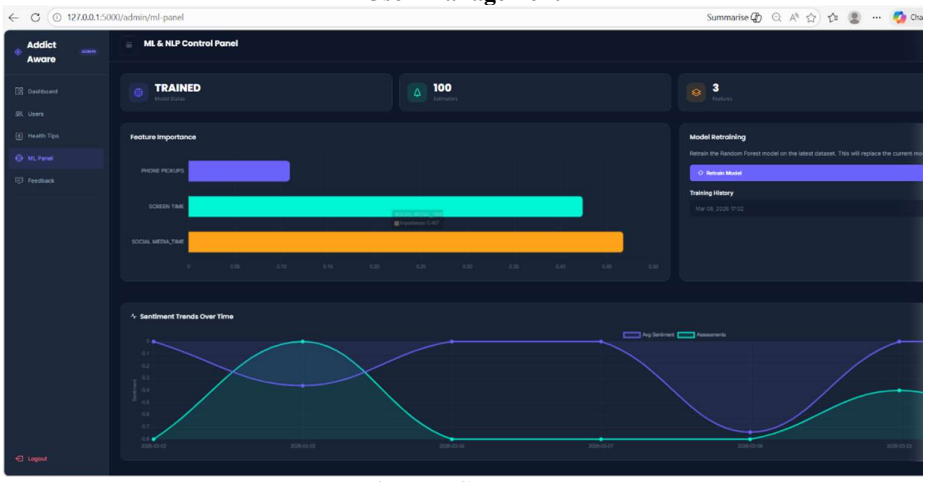
Requesting Health Tips



Admin Dashboard



User Management



ML & NLP Control Panel

RESULT

The Addict Aware system was evaluated under different user scenarios to assess its performance, usability, and accuracy. The application successfully collected user inputs such as screen time, social media usage, and phone activity patterns, and processed this data efficiently to determine addiction levels.

The system showed reliable performance in storing and retrieving user data using the MySQL database. Machine learning algorithms such as Support Vector Machines, Random Forest, and Neural Networks were used to classify users into different addiction categories (Low, Medium, High), providing quick and accurate predictions. In addition, the NLP module effectively analyzed user feedback to identify emotional and behavioral patterns related to smartphone addiction. The system also generated visual outputs such as graphs and addiction scores, helping users clearly understand their usage behavior and addiction risk.

Overall, the system provided personalized suggestions such as screen time alerts and digital detox recommendations. It demonstrated good responsiveness, ease of use, and scalability, making it a practical and effective solution for managing mobile phone addiction in real-world scenarios.

CONCLUSION

The Mobile Phone Addiction Detection System leverages AI and Machine Learning to monitor and analyze smartphone usage patterns. It predicts addiction risk levels and identifies behavioral trends to provide personalized interventions. By using

NLP, it also analyzes textual feedback and social media for emotional insights. Unlike manual methods, the system offers accurate, intelligent, and data-driven support. It helps users manage phone usage and promotes mental health awareness. Its scalable design makes it useful for individuals and professionals alike.

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