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# ELECTRONIC GADGET ADDICTIONSYSTEM

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***Abstract*** *- The rapid growth of digital technology has significantly increased the use of electronic gadgets such as smartphones, laptops, and gaming devices among students. Although these devices support learning and communication, excessive usage may lead to gadget addiction, sleep disturbances, reduced academic performance, and increased stress levels. This study proposes a machine learning–based system to predict electronic gadget addiction among students using behavioral analysis. The system collects data through questionnaires that evaluate screen time, social media usage, gaming habits, sleep duration, study hours, and stress levels.*

***Keywords:*** *Gadget Addiction, Machine Learning, Digital Stress, Student Behavior Analysis, Sentiment Analysis, Flask*

## I. INTRODUCTION

The rapid development of digital technology has transformed the lifestyle of students by providing easy access to information, communication platforms, and online learning resources. Electronic gadgets such as smartphones, tablets, laptops, and gaming consoles have become an essential part of modern education. Students rely on these devices for academic activities, social networking, entertainment, and communication.Despite these advantages, excessive and uncontrolled gadget usage has raised serious concerns regarding students' mental and physical health. Prolonged screen exposure may lead to sleep disorders, eye strain, decreased physical activity, poor academic performance, and increased stress levels.

## II. METHODOLOGY

The proposed system collects students' gadget usage data through questionnaires and interactive tests. The collected data is preprocessed and organized for analysis using a web-based system developed with Python and the Flask framework. Based on user responses, the system evaluates behavioral patterns and predicts gadget addiction levels such as low, moderate, or high. Additional modules analyze sleep patterns, stress levels, and digital behavior to provide a better understanding of students' technology usage. The results are stored and monitored through an admin dashboard to track overall system performance and user activity. This approach helps identify risky digital habits and supports early awareness and preventive actions.

### 2.1 System Architecture of the Proposed Model

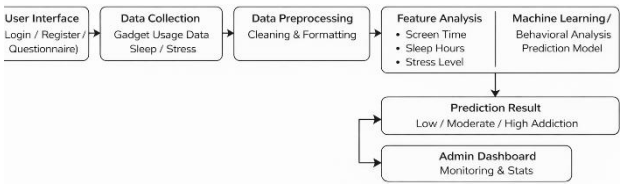


**Fig 1:** System Flow

The system architecture for predicting electronic gadget addiction among students consists of several stages. First, the **User Interface** collects information from students through login and questionnaires about gadget usage, sleep

patterns, and stress levels. The **Data Collection** module gathers this information and sends it for **Data Preprocessing**, where the data is cleaned and formatted. Next, **Feature Analysis** evaluates important factors such as screen time, sleep hours, and stress level. These features are then processed using a **Machine Learning model** that analyzes behavior patterns and predicts addiction levels. Finally, the **Prediction Result** classifies students as having low, moderate, or high addiction, and the **Admin Dashboard** monitors system statistics and results.The system helps identify risky digital habits among students and provides insights for better gadget usage management. It also assists administrators in tracking trends, analyzing data patterns, and improving awareness about healthy technology use among students. By using machine learning techniques, the system can detect patterns in large datasets and improve prediction accuracy over time. The collected information can also be used for research purposes to study the impact of electronic gadgets on student health, academic performance, and daily routines. Overall, the proposed system supports early detection of gadget addiction and encourages responsible technology usage among students.

### 2.2 Data Collection and Preprocessing

Data collection is an important step in predicting electronic gadget addiction among students. In this system, data is collected from students through online questionnaires and surveys. The questionnaire includes questions related to **daily screen time, type of gadgets used, sleep duration, study time, social media usage, and stress levels**. These responses help in understanding the behavioral patterns of students and their level of dependency on electronic gadgets.After collecting the data, the **data preprocessing** stage is performed to prepare the dataset for analysis. In this step, incomplete or incorrect data entries are removed to maintain accuracy. Missing values are handled, and the data is organized into a structured format. The collected information is then converted into numerical values so that it can be easily processed by machine learning algorithms.Additionally, the dataset is normalized and categorized based on different factors such as **screen usage duration, sleeping habits, and stress indicators**. This step helps in improving the efficiency and accuracy of the prediction model. Proper preprocessing ensures that the machine learning system receives clean and reliable data, which leads to better prediction of gadget addiction levels among students.

### 2.3 Implementation of Machine Learning Model

The implementation of the machine learning model is an important stage in predicting electronic gadget addiction among students. After data collection and preprocessing, the cleaned dataset is used to train the prediction model. The dataset contains features such as screen time, sleep hours, social media usage, study time, and stress levels, which influence students' gadget usage behavior.In this system, machine learning techniques are used to analyze the relationship between these input features and the level of gadget addiction. The dataset is divided into **training data and testing data**. The training data is used to build the model, while the testing data is used to evaluate its performance and prediction accuracy.A classification-based machine learning algorithm is applied to categorize students into different addiction levels such as **low, moderate, or high**. The model learns patterns from the historical data and uses these patterns to predict the addiction level for new user inputs. Once the model is trained, it can analyze the user responses provided through the system and generate prediction results.The final output of the model is displayed through the system interface, helping students and administrators understand gadget usage behavior. This implementation helps in identifying students who may be at risk of gadget addiction and supports early awareness and preventive actions.

## III. MODELING AND ANALYSIS

The modeling and analysis phase focuses on developing a predictive system that can identify the level of electronic gadget addiction among students based on their behavioral data. In this stage, the collected and preprocessed dataset is used as input for building the prediction model. The dataset includes various features such as daily screen time, social media usage, gaming duration, sleep hours, study time, and stress indicators. These factors play an important role in understanding students' digital behavior and

their dependency on electronic gadgets.During the modeling process, the dataset is divided into two parts: the **training dataset** and the **testing dataset**. The training dataset is used to train the machine learning model, allowing it to learn patterns and relationships between the input features and gadget addiction levels. The testing dataset is then used to evaluate the performance of the trained model and measure its prediction accuracy.Machine learning algorithms analyze the behavioral patterns of students and classify the addiction level into categories such as **low, moderate, or high**. The modelidentifies

## IV. RESULTS AND DISCUSSION

The results of the proposed system demonstrate that the prediction model can effectively analyze students' gadget usage behavior and identify the level of electronic gadget addiction. The system processes various input features such as daily screen time, social media usage, gaming duration, sleep hours, and stress levels to determine the addiction category. Based on the analysis, students are classified into different levels such as **low, moderate, or high gadget addiction**.The experimental results show that students who spend more hours on electronic gadgets and have poor sleep habits are more likely to fall into the higher addiction category. On the other hand, students who maintain balanced gadget usage and proper study schedules are generally classified under the low addiction category. The analysis also indicates a strong relationship between excessive screen time and increased stress levels among students.The system provides prediction results through a user interface and records the outcomes in the database for monitoring. The **admin dashboard** displays system statistics such as the number of users, tests taken, and prediction results. These insights help in understanding digital behavior trends among students.Overall, the proposed system successfully identifies patterns in gadget usage and provides useful information for recognizing risky digital habits. The results highlight the importance of monitoring gadget usage and promoting responsible technology use to support students' academic performance and well-being. Additionally, graphical analysis and system statistics help administrators easily interpret the data and observe trends in students' digital behavior over time.F correlations between factors like screen usage and sleep patterns, which helps in predicting the addiction level more accurately. Visualization techniques such as graphs and charts can also be used to represent data patterns and analysis results.The analysis results help in understanding the impact of electronic gadget usage on students' daily activities. These insights assist educators and administrators in identifying students who may be at risk of gadget addiction and encourage the adoption of healthier digital habits.


**Fig 2** :Gadget Addiction Prediction Result

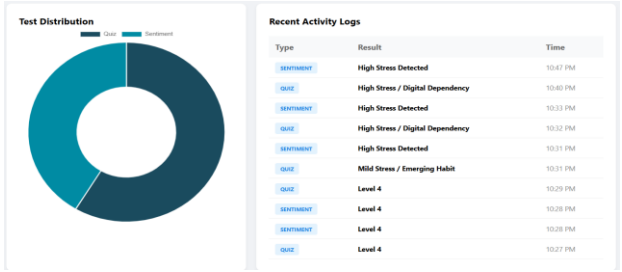


**Fig 3:** Admin Dashboard Monitoring System

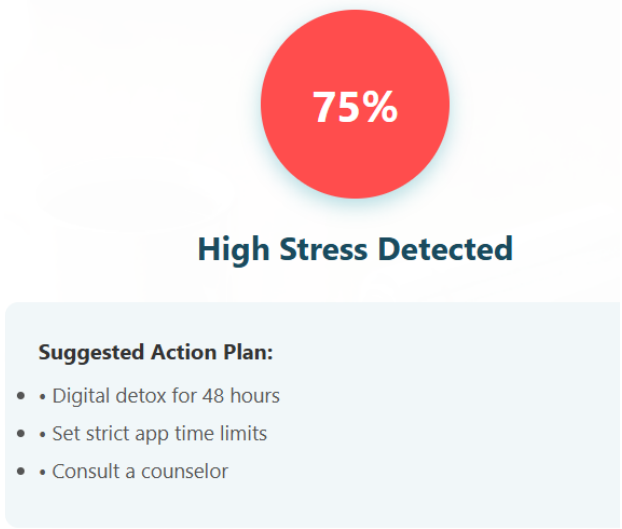


**Fig 4:** Sentiment Stress Prediction

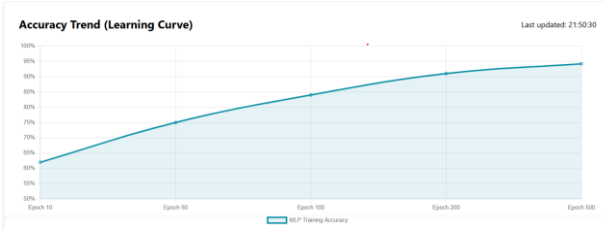


**Fig 5:** Model Accuracy Analysis of the Proposed System

## V. CONCLUSION

This study presents a system for predicting electronic gadget addiction among students using behavioral analysis and machine learning concepts. The system collects data related to gadget usage, sleep patterns, stress levels, and study habits through questionnaires and tests. By analyzing these factors, the system classifies students into different addiction levels such as low, moderate, or high. The implementation using Python and the Flask framework enables efficient data processing and result generation. The results indicate that excessive screen time and poor sleep habits are closely related to gadget addiction. Overall, the system helps identify risky digital behavior and supports awareness for healthier and more responsible technology usage among students.

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