iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 14 **Issue:** III **Month of publication:** March 2026

DOI: https://doi.org/10.22214/ijraset.2026.78543

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 14 Issue III Mar 2026- Available at www.ijraset.com

Social Media Addiction and Relationship Impact Analysis System

Ms. T. Princess Raichel[1], Padigala Dwaraka[2], Palagiri Vedhitha[3], Palagiri Asif[4], Palyam Thowhid[5], Padigepati Sudheer Kumar Reddy[6]

[1]*Assistant Professor, Sri Venkateswara College of Engineering and Technology(SVCET),Chittoor*
[2, 3, 4, 5, 6]*CSE (Data Science), Sri Venkateswara College of Engineering and Technology(SVCET),Chittoor*

Abstract: ***Social media platforms have become an integral part of modern communication, enabling users to interact, share information, and maintain social connections. However, excessive usage of social media has emerged as a growing concern, often leading to behavioral addiction that negatively influences emotional well-being and interpersonal relationships.***

This project proposes a Social Media Addiction and Relationship Impact Analysis System that utilizes machine learning techniques to identify addiction levels and analyze their impact on relationship quality. The system collects user behavioral data such as daily usage duration, login frequency, late-night activity, and interaction patterns along with relationship indicators including communication frequency, emotional support level, and satisfaction score. The collected data is processed using preprocessing techniques and analyzed using the Random Forest classification algorithm to categorize addiction levels into Low, Moderate, and High. The system further evaluates how these addiction levels affect communication quality, trust, and emotional bonding in relationships.

Experimental results demonstrate that the proposed system effectively detects addiction patterns and predicts relationship impact with high accuracy. The system also provides visualization dashboards and recommendations to promote awareness and help users maintain healthy digital habits.

I. INTRODUCTION

Social media has transformed the way individuals communicate and interact with others. Platforms such as Facebook, Instagram, and Twitter allow users to stay connected regardless of geographical boundaries. While these technologies offer numerous advantages, excessive use of social media has led to the emergence of social media addiction, which can negatively influence psychological health and interpersonal relationships.

Many individuals spend a significant portion of their daily time on social media platforms, often reducing real-life communication and emotional interaction with family members, friends, or partners. This overuse may lead to issues such as reduced relationship satisfaction, emotional neglect, increased conflicts, and communication breakdown.

Traditional studies on social media addiction mainly rely on surveys and manual analysis. These approaches are often time-consuming, limited in scalability, and prone to bias due to self-reported data. Therefore, there is a need for an automated system that can analyze user behavior and predict the potential impact of social media addiction on relationships.

The proposed Social Media Addiction and Relationship Impact Analysis System addresses this issue by integrating data analytics and machine learning techniques. The system collects structured data related to social media usage and relationship indicators, preprocesses the data, and applies classification algorithms to detect addiction levels. In addition, the system analyzes relationship impact indicators such as communication quality, emotional bonding, and conflict frequency.

By providing analytical insights and visual dashboards, the system enables users, researchers, and counselors to better understand the behavioral effects of social media usage and take preventive measures to maintain healthy relationships.

II. LITERATURE REVIEW

A. Social Media Addiction Studies

Several studies have examined the behavioral effects of excessive social media usage. Researchers have identified social media addiction as a behavioral disorder that may cause emotional dependency and reduced self-control. Excessive engagement with online platforms often leads to reduced face-to-face communication and decreased relationship satisfaction.

©IJRASET: All Rights are Reserved

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 14 Issue III Mar 2026- Available at www.ijraset.com

B. Psychological and Relationship Effects

Research indicates that heavy social media usage may increase feelings of loneliness, jealousy, and anxiety among users. These emotional responses can negatively affect interpersonal relationships, leading to misunderstandings and conflicts.

C. Machine Learning Applications in Behavioral Analysis

Machine learning algorithms are increasingly used to analyze behavioral patterns and predict outcomes. Algorithms such as Decision Trees, Support Vector Machines, and Random Forest are widely used for classification tasks involving behavioral data.

D. Limitations of Existing Systems

Most existing research focuses on psychological analysis rather than automated prediction systems. There is limited work that integrates addiction detection, relationship impact analysis, and machine learning-based prediction into a single framework.

E. Research Gap

Existing systems lack automated tools that analyze social media usage patterns and predict their impact on relationships. Therefore, this research proposes a machine learning-based analytical system that can detect addiction levels and evaluate relationship impacts effectively

III. PROPOSED METHODOLOGY

The proposed system follows a structured process consisting of data collection, preprocessing, feature extraction, model training, and result visualization**.**

A. Data Collection

The system collects user data related to social media behavior and relationship indicators. The dataset includes attributes such as:

1) Daily social media usage hours
2) Login frequency
3) Late-night activity
4) Interaction count
5) Platform switching behavior
6) Communication frequency
7) Emotional support level

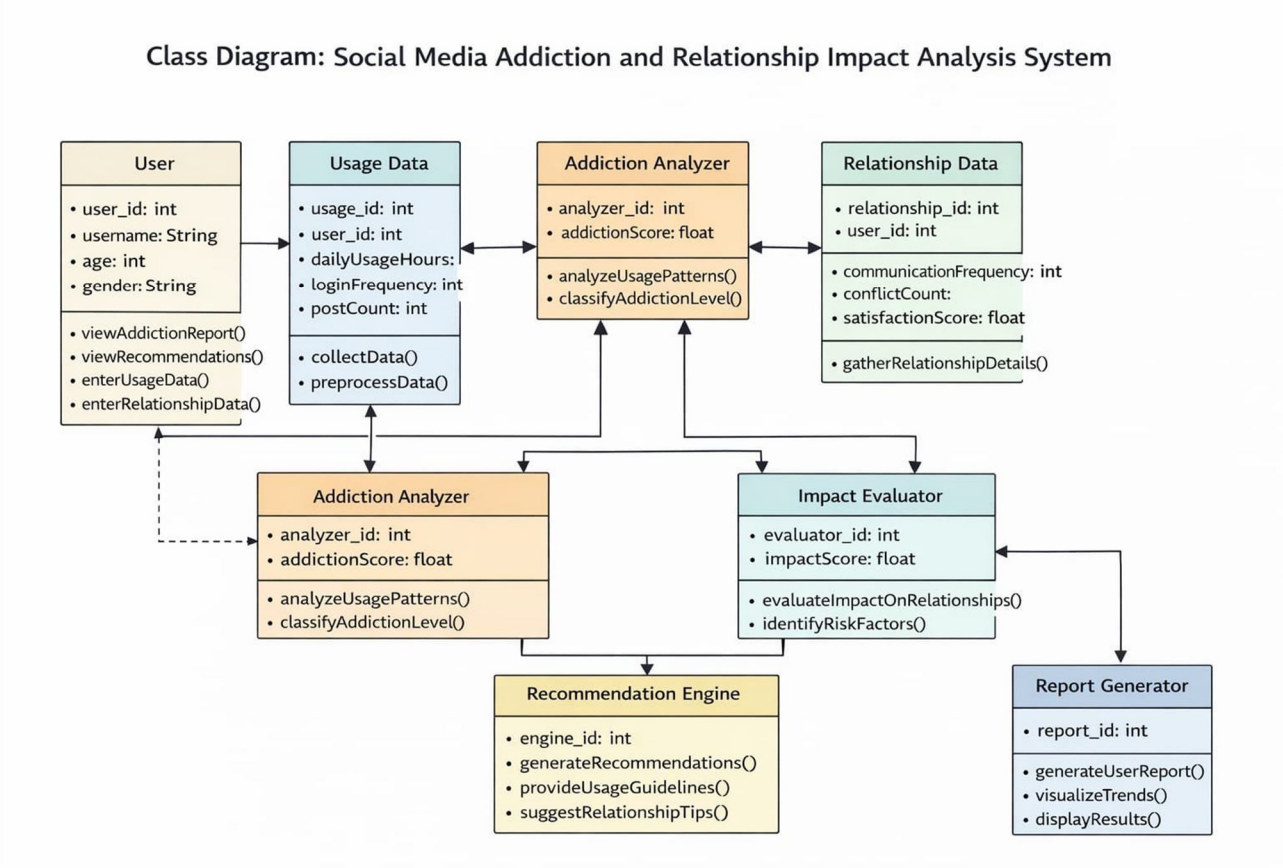
Table I. Dataset Description and Composition

User_ID	*Daily_Usage_Hours*	*Login_Frequency*	*Late_Night_Activity*	*Interaction_Count*	*Emotional_Dependency_Score*	*Communication_Frequency*	*Conflict_Frequency*	*Relationship_Satisfaction*	*Addiction_Level*
U101	2.5	6	Low	25	2	High	Low	High	Low
U102	5.8	12	Medium	40	5	Medium	Medium	Medium	Moderate
U103	8.2	20	High	65	8	Low	High	Low	High
U104	3.1	7	Low	30	3	High	Low	High	Low
U105	6.5	15	Medium	48	6	Medium	Medium	Medium	Moderate
U106	7.9	18	High	60	7	Low	High	Low	High

©IJRASET: All Rights are Reserved

B. Data Preprocessing:

Collected data may contain missing values or inconsistencies. Therefore, preprocessing techniques such as data cleaning, normalization, and duplicate removal are applied to ensure reliable analysis.



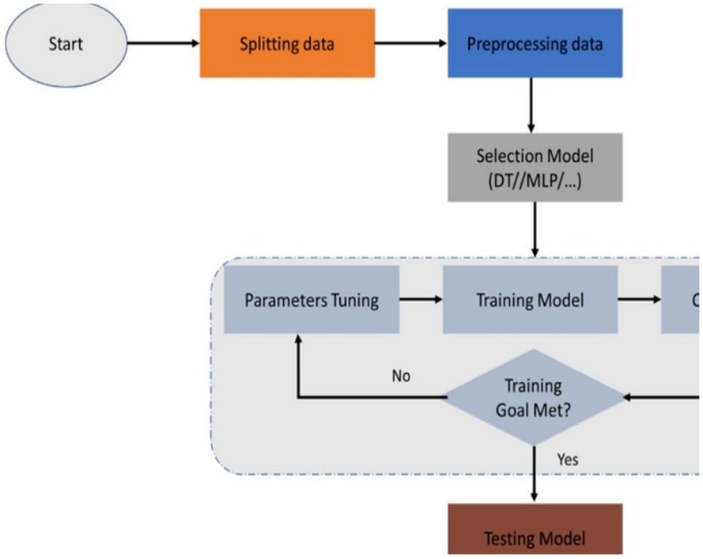


Fig1: Flowchart of the General Machine Learning Process

C. Feature Extraction

Important behavioral indicators are extracted from the dataset, including:

- Addiction intensity score
- Emotional dependency index
- Communication imbalance ratio
- Online engagement density

These features help in identifying addiction patterns and behavioral changes.

D. Addiction Classification

A Random Forest classification algorithm is used to classify users into three addiction categories:

- Low Addiction
- Moderate Addiction
- High Addiction

Random Forest is chosen because of its ability to handle large datasets and improve prediction accuracy through ensemble learning.

E. Relationship Impact Analysis

After addiction classification, the system analyzes how addiction levels affect relationship indicators such as communication quality, emotional bonding, trust level, and conflict frequency.

F. Trend Analysis

The system analyzes behavioral patterns over time to identify increasing or decreasing addiction trends and their corresponding impact on relationships.

G. Visualization and Reporting

The final results are presented through visual dashboards that include charts, graphs, and classification reports for easy interpretation.

IV. RESULTS AND DISCUSSION

1) Model Performance: The Random Forest model was trained and tested using the collected dataset. The model demonstrated strong performance in identifying addiction categories.
2) Classification Accuracy: The proposed system achieved an overall classification accuracy of 91.8%, indicating reliable prediction performance.
3) Behavioral Pattern Analysis: Experimental results show that users with higher social media usage hours and frequent late-night activity are more likely to fall into the High Addiction category.
4) Relationship Impact Findings

The analysis revealed that increasing addiction levels correspond to:

- Reduced communication quality
- Increased emotional conflicts
- Lower relationship satisfaction

5) Visualization Results: The system generates graphs such as accuracy curves, confusion matrices, and trend charts, allowing users to easily interpret addiction patterns and relationship impacts.

V. CONCLUSIONS

This research presented a Social Media Addiction and Relationship Impact Analysis System that utilizes machine learning techniques to detect addiction levels and analyze their influence on relationships. The system integrates data preprocessing, feature extraction, Random Forest classification, and visualization to provide comprehensive behavioral insights. Experimental results show that the system can accurately classify addiction levels and identify their impact on relationship quality. The system also helps in early detection of risky behavioral patterns and supports awareness about responsible social media usage.

Future improvements may include integrating real-time data from social media platforms, implementing deep learning models, and developing mobile-based wellness applications.

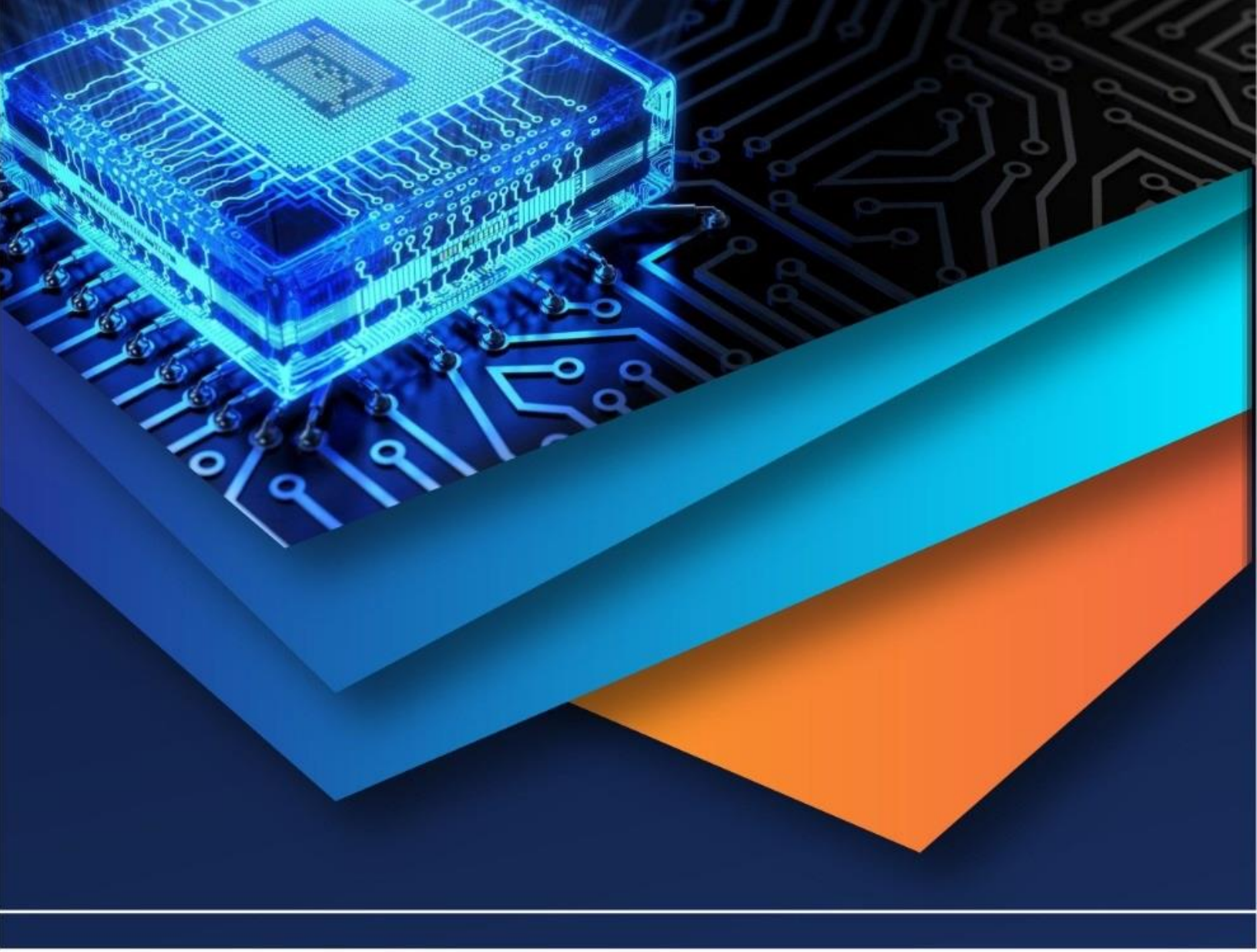
©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

VI. ACKNOWLEDGMENT

The authors would like to express their sincere gratitude to the management and faculty members of Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor, for providing the necessary support and resources to complete this project. Special thanks to Ms. T. Princess Raichel, the project guide, for her valuable guidance, suggestions, and encouragement throughout the project development process.

REFERENCES

[1] Andreassen, C. S., et al. (2016). The relationship between addictive use of social media and psychological disorders.
[2] Kross, E., et al. (2013). Facebook use predicts declines in subjective well-being. PLOS ONE.
[3] Griffiths, M. D. (2012). Social networking addiction: Emerging behavioral addiction.
[4] Han, B., et al. (2022). Social media addiction and its impact on relationships.
[5] Breiman, L. (2001). Random Forests. Machine Learning Journal.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)