Project Report: Social Media Usage and Emotional Well-Being

Subject: Analysis of Social Media Habits and Emotional Impact

1. Executive Summary

This project explores the link between social media usage and mental health. By analyzing user behavior—such as time spent online and the number of likes received—we developed a machine learning model to predict a user's dominant emotion. The final model achieved a high accuracy of **95.15%**, proving that digital habits are strong indicators of emotional state.

2. Project Objective

The main goal was to build a system that can classify a user's emotional state (e.g., Happiness, Anxiety, Sadness, Neutral) based on their daily social media activities. This helps in understanding how digital interactions impact well-being.

3. Data Description

The analysis used the "Social Media Usage and Emotional Well-Being" dataset.

- **User Demographics:** Age and Gender.
- **Platforms:** Instagram, Facebook, Twitter, Snapchat, Telegram, WhatsApp, LinkedIn.
- **Usage Metrics:**
  - Daily Usage Time (minutes)
  - Posts per Day
  - Likes and Comments Received
  - Messages Sent

4. Methodology

To achieve the results, the following technical steps were taken:

- **Data Cleaning (EDA):** The data was checked for errors and missing values to ensure quality. We also analyzed the distribution of emotions to understand the dataset balance.
- **Feature Engineering:** Text-based data (like "Male/Female" or "Instagram") was converted into numbers so the computer could process it.
- **Model Selection:** Three distinct algorithms were tested to find the best predictor:
  1. **Naive Bayes:** Used as a baseline model.
  2. **Random Forest:** Used for its ability to handle complex data structures.
  3. **XGBoost:** Selected for its high performance and accuracy.

5. Key Findings & Results

After rigorous testing, the **XGBoost** model was identified as the best performer.

- **Final Accuracy: 95.15%**
- **Performance:** The model successfully distinguished between different emotions with very few errors.
- **Reliability:** The Confusion Matrix (a tool for checking errors) confirmed that the model is robust and reliable for real-world predictions.

6. Conclusion

The project successfully demonstrated that social media usage patterns can accurately predict emotional well-being. The XGBoost model provides a powerful tool for this analysis, offering high precision and reliability.