In this thesis, we compare deep learning models for the purpose of predicting the popularity of social media posts. We curated a comprehensive dataset from a renowned social media platform, encompassing a rich variety of features including images, text captions, and social attributes. Each model's performance was evaluated based on Mean Squared Error, Mean Absolute Error, and Spearman's rank correlation coefficient. Our model, integrating convolutional neural networks for visual inputs, transformer-based models for text, and layers for social inputs, achieved a higher composite score across all evaluation metrics in contrast to the baseline model. Enhancements such as the addition of a caption network, sentiment analysis, and the removal of scaling further boosted the performance. This study illuminates the potential of deep learning in improving the precision of popularity prediction for social media posts.