



PROJECT REPORT
ANALYSIS OF PLAYER ENGAGEMENT DYNAMICS
IN ONLINE MULTIPLAYER GAMES

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ABSTRACT

Multiplayer online games have become a dominant form of entertainment, yet the dynamics of player engagement and the impact of in-game social interactions remain complex. This study addresses this by analyzing survey data from 42 multiplayer online game players to identify underlying behavioral patterns. A quantitative approach was employed, utilizing the K-Means clustering algorithm to segment players into distinct personas. The analytical process was enhanced by feature selection using a Random Forest model and dimensionality reduction via Principal Component Analysis (PCA) to ensure a robust analysis. The results successfully identified four distinct player personas, ranging from 'Casual, Less Social' to 'Hardcore, Highly Social'. The findings quantitatively underscore the importance of social interaction, which received an average importance score of 4.13 out of 5, with 61.9% of respondents confirming that in-game interactions impact their real lives. The quality of the clustering model was validated by a significant improvement in the Silhouette Score from 0.47 to 0.59 after feature selection and dimensionality reduction. These findings demonstrate that data mining techniques can effectively deconstruct player engagement patterns, offering valuable, data-driven insights for game developers to optimize social features and enhance the overall player experience.

Keywords: *multiplayer online games, player engagement, k-means clustering, social interaction, player personas.*

