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# **CAPSTONE PROJECT PROPOSAL**



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# Gaming Behavior Predictions.

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### Executive Summary:

This project aims to analyze player behavior in online gaming environments and predict player engagement levels. By leveraging comprehensive metrics and demographics related to player behavior, we aim to develop predictive models that can identify patterns and trends in player retention and engagement. The insights from this analysis will help optimize game design, enhance marketing strategies, and improve the overall player experience.

### Problem Statement:

Understanding player behavior and predicting engagement levels are crucial for the success of online games. However, there is a need for detailed analysis to uncover the factors influencing player retention. Our objective is to create predictive models that analyze player behavior and accurately predict engagement levels. This will enable game developers to tailor their strategies to retain players and enhance their gaming experience.

### Data Source:

Our primary data comes from the Online Gaming Player Behavior Dataset. This dataset includes comprehensive information on player demographics, game-specific details, engagement metrics, and a target variable reflecting player retention.

### Methodology:

**Data Collection:** Utilize the provided player behavior dataset.

**Data Preparation:** Clean and preprocess the data, handle missing values, and encode categorical variables. Standardize numerical features such as playtime hours, sessions per week, and average session duration.

**Analysis Techniques:** Perform exploratory data analysis (EDA) to understand the distribution and relationships among features. Apply feature selection to identify the most significant predictors of player engagement. Train and evaluate various machine learning models (e.g., logistic regression, decision trees, random forests, support vector machines, and neural networks) to identify the best-performing model. Conduct hyperparameter tuning to optimize model performance.

**Tools:** Use Python with libraries such as pandas, numpy, scikit-learn, and matplotlib for data analysis and model development. Jupyter Notebook will be utilized for experimentation and visualization.

Expected Outcome:

Accurate prediction of player engagement levels.

Enhanced understanding of key factors influencing player behavior and retention.

Identification of significant features contributing to player retention.

Actionable recommendations for game design and marketing strategies based on model insights.

Tools and Technologies:

Python for data analysis and machine learning model development.

Libraries: pandas, numpy, scikit-learn, matplotlib.

Jupyter Notebook for experimentation and visualization.

Risks and Challenges:

Data quality issues, such as missing or inconsistent values.

Imbalanced dataset with more instances of one engagement level affecting model performance.

Complexity in interpreting model predictions and translating them into actionable insights for game design and marketing.

Ensuring data privacy and compliance with relevant regulations

Conclusion:

**'Predicting Gaming Behavior'** aims to enhance the understanding of factors contributing to player behavior and retention in online gaming environments. By creating robust predictive models and leveraging comprehensive player data, the project seeks to deliver accurate predictions and valuable insights for game developers and marketers. This project represents a crucial step towards improving player engagement strategies, game performance, and overall player satisfaction.