BEHAVIORAL PATTERN RECOGNITION OF MULTIPLAYER ONLINE ROLE-PLAYING GAME PLAYERS USING BIG DATA ANALYTICS AND ARTIFICIAL NEURAL NETWORKS

PROJECT PROPOSAL

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I. DOMAIN AND CONTEXT

1. Domain

A massively multiplayer online game (more commonly, MMO) is an online game which is capable of supporting large numbers of players, typically from hundreds to thousands, simultaneously from around the world.

These games can be found for most network-capable platforms, including the personal computer, video game console, or smartphones and other mobile devices. MMOs can enable players to cooperate and compete with each other on a large scale, and sometimes to interact meaningfully with people around the world.

2. Industry worth

The UK MMO-market is worth £195 million in 2009 compared to the £165 million and £145 million spent by German and French online gamers. The US gamers spend more, however, spending about $3.8 billion overall on MMO games. $1.8 billion of that money is spent on monthly subscription fees. The money spent averages out to $15.10 between both subscription and free-to-play MMO gamers. The study published by "*Today's Gamers MMO Focus Report*" also found that 46% of 46 million players in the US pay real money to play MMO games.

3. Context of this Project

It is challenging to develop the database engines that are needed to run a successful MMOG with millions of players. Understanding the behavior of players using their activity data is more important for these game developers to come up with better strategies in game development.

The variety, volume, velocity, value and veracity (Big Data 5Vs) of data that is involved in these Gaming environments exceed the limits of analysis and manipulation of conventional tools, therefore, Big Data platforms are required to handle and interpret this data.

Great volumes of data are generated all the time in these environments. Each interaction made by a player creates data that are transferred and stored, and if properly analyzed, can contain valuable information. This information can be vital for the continuity and improvement of a game. Patterns can be detected from these data and even predictive analysis can be made to foresee the actions and intentions of the players inside the game.

4. Objective

Objective of this Project is to perform analytics on one such Big Data Gaming Environment and the results would help game developers in:

- Optimizing user experience
- Improving revenue
- Raise the level of control over the environment

II. PROBLEM STATEMENT

1. Perform Exploratory analysis

1.1 To cluster players into different groups based on features in dataset
1.2 To analyze and visualize timeline patterns of players by different groups and parameters
1.3 To create heat map based on the gaming zones
1.4 To visualize patterns based on Guilds they belong to

2. Perform Predictive Analytics by applying Neural Networks

2.1 Player pattern recognition based on clusters formed in 1.1
2.2 Player assiduity recognition based on clusters formed in 1.1

III. DATASET

We have chosen an online game named “World of Warcraft” which is most suitable for this Project.

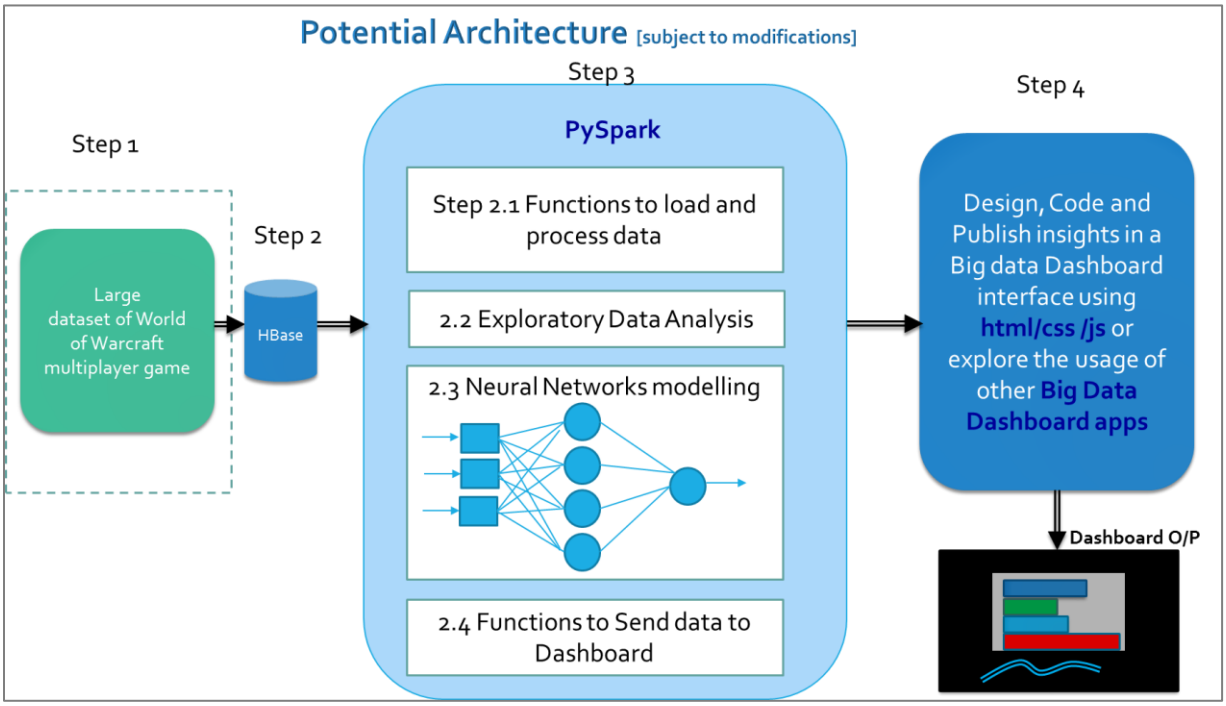
A large and scalable dataset with 3 years of player logs are released by Blizzard Entertainment for research purposes. We are using this dataset of our Project.

Data set Summary	
Attribute	**Value**
Data duration (in days)	1107
Sampling Rate per day	124
No. of Samples	138084
No. of Records (rows)	36,513,647
No. of Values (Data points)	438,163,764
Size of data (in GB)	3.4
Dataset Type	Logs
Format	Text Files
No. of Folders	1095

Field Description		
Field	**Description**	**Data Type**
Query Time	Date and time when logs were generated	integer
Query Seq. #	Sequence of queries	integer
Avatar ID	Unique id for each user	integer
Guild	Group id of the player	integer
Level	Game level of the player	integer
Race	Blood Elf, Orc, Tauren, Troll, Undead	String
Class	Death Knight, Druid, Hunter, Mage, Paladin, Priest, Rogue, Shaman, Warlock, Warrior	String
Zone	One of the 229 Zones in World of WarCraft game	String

IV. POTENTIAL ARCHITECTURE [SUBJECT TO MODIFICATIONS]

We have created the below architecture to implement this Project:



V. References

i. **Big Data Analytics Using Neural networks**
***Author**: Chetan Sharma*
***Master's Thesis:** San Jose State University*

ii. **Game Analytics - Maximizing the Value of Player Data**
***Authors:** Magy Seif El-Nasr, Anders Drachen and Alessandro Canossa*
***Publisher:** Springer*

iii. **Big Data Analytics in Cloud Gaming**
***Authors:** Victor Perazzolo Barros and Pollyana Notargiacomo*
Paper: 2016 IEEE International Conference on Big Data

iv. **Setting Players' Behaviors in World of Warcraft through Semi-Supervised Learning**
***Authors:** Marcelo Souza Nery, Victor do Nascimento Silva, Roque Anderson S. Teixeira and Adriano Alonso Veloso*