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**Mini Project: Tic TAC Toe on Tableau**

**Abstract**:

Business intelligence (BI) is a set of theories, methodologies, architectures, and technologies that transform raw data into meaningful and useful information for business purposes. BI can handle enormous amounts of unstructured data to help identify, develop and otherwise create new strategic business opportunities. Tableau has the statistical capabilities with the "R" integration.

Tableau is a business intelligence software that allows anyone to easily connect to data, then visualize and create interactive, sharable dashboards. It's a powerful tool to satisfy even the most complex analytical problems. It’s a great tool for a start-up business company and so is our project. The dashboard will be used to play tic tac toe game on tableau. The project will allow multiple users to access the system. This game is accessible from anywhere in the world, and any user with an access to internet can see it. We can also quickly store data on the fly from Salesforce, Google Analytics or any of such databases. Tableau defaults are based on best practices, so the initial result contains good colour combinations and layout. The user interface is well-organized so you can customize the view with a few clicks vs. multiple menus, etc. As Tableau Server uses SAML Authentication which can be federated to Microsoft Active Directory, it allows us to create a Single Sign on (SSO) experience in a mixed infrastructure which will be demonstrated in this project. This project will be highly scalable, and stable and very secure and it will have no deployment issues.

The AI’s algorithm for building tic tac toe on tableau will have the following steps:

1.   First, see if there’s a move the computer can make that will win the game. If there is, take that move. Otherwise, go to step 2.

2.   See if there’s a move the player can make that will cause the computer to lose the game. If there is, move there to block the player. Otherwise, go to step 3.

3.   Check if any of the corner spaces (spaces 1, 3, 7, or 9) are free. If so, move there. If no corner piece is free, then go to step 4.

4.   Check if the centre is free. If so, move there. If it isn’t, then go to step 5.

5.   Move on any of the side pieces (spaces 2, 4, 6, or 8). There are no more steps, because if the execution reaches step 5 the side spaces are the only spaces left.

So there are 9 spaces for the first move, and let’s say X goes first, then it will have 9 positions it can occupy and 0 goes second it has eight possible spaces it can choose and 9 X 8 = 72 combinations of Board 1. So, just 2 plays into the game, there are 72 possible outcomes, but 72 + 9 combinations of moves. When you work your way through to every possible outcome, there are (9 X 8 X 7 X 6 X 5 X 4 X 3 X 2 X 1) + (9 X 8 X 7 X 6 X 5 X 4 X 3 X 2) + (9 X 8 X 7 X 6 X 5 X 4 X 3) + (9 X 8 X 7 X 6 X 5 X 4) + (9 X 8 X 7 X 6 X 5) + (9 X 8 X 7 X 6) + (9 X 8 X 7) + (9 X 8 X 7) + (9 X 8) + 9 possible moves. Except that some moves result in wins before every space is used. Then, multiply the result by 9 (one record for every space) and the end result is nearly 5,000,000.

**Project Requirements:**

* Tableau
* Tableau Server
* Operating System: Windows 8/10.

**Hardware Requirements:**

* 8GB of RAM, and 64 bit Configuration.

**Expected Risks:**

* Some of the risks that can be identified and that needs to be taken care of are – losing of data, connection with server.
* Since we have every possible board combination, it would be difficult to store all the datasets on tableau.