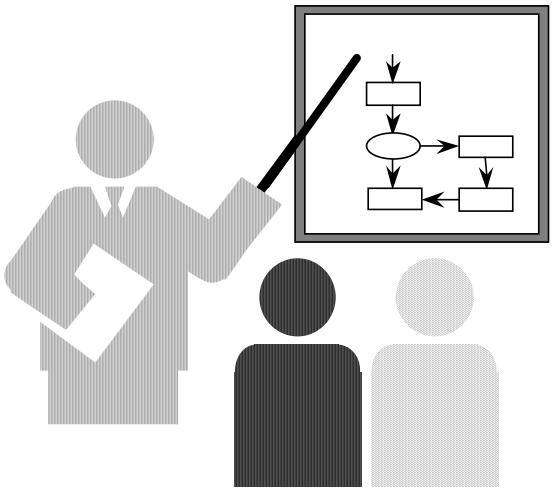
TTT Project

Requirements Document / Use Case Analysis



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Contents

1. Domain Model

1.1 Domain Model Description

Domain model is a conceptual model that shows important objects and concepts in the business. It represents both the key concepts and the vocabulary of the problem domain. A domain model shows the relationships between the concepts in the problem domain and identifies the attributes of that concept. A domain model does not reflect the methods. It encapsulates the methods to hide the details. Thus a domain model consists of concepts, attributes and the association between those concepts.

The domain model of figure below depicts our initial understanding of what conceptual classes are likely to be necessary, to build the Tic-Tac-Toe game. Some of the main conceptual classes of our system are explained below:

TTT game* is the main conceptual class for our system. TTT game can be played by a **Player**. A player can choose the **Game level** from Beginner, Intermediate and Advanced. A player can be Human or Computer. A human player can view the **Score Board** which generates the **Game Result** that will declare whether a player is a winner, loser or there is a tie. This Game Result will generate a **Gift** that will be given to the player upon winning the game. A player an also exit the game anytime he/she wants.

A player is also allowed to choose the **Marker Type** from 'X' or 'O'. This marker type is represented by the **Marker** placed by the player. A player can place 3, 4 or 5 marks in a game, to complete the game or win the game. A player is assigned the time limit by the **Timer** which limits the time in which the player can place a mark on the board. This timer is displayed on the board.

TTT game includes a board which is composed of 9 **Unit of grids**, that is the squares, on which a player is allowed to place a mark. TTT game also has a button to show the game **Instruction**. While a game is being played, TTT game will play the background **music** for its players for some additional entertainment.

1.2 Important attributes of the conceptual classes

Important attributes of the given domain model includes:

- name- Name of the player
- play_turn-Which player turn it is
- X/O- Marker type of that player ('X' or 'O')

*Note: All the conceptual classes are made bold and all the association names are underlined for the readers to relate it with the diagram.

- state- A boolean value representing the State of grid to indicate whether the grid is empty of filled
- win/tie/lose- Game result whether it is a tie, win or a loose.
- time limit- This is the limit on the player's ability to make the move.
- toatl_time_of_a_game- Total time of the game.

1.3 Important multiplicities between the conceptual classes

Some of the important multiplicities between conceptual classes are:

- A player can mark on the board 3 times (winning condition in first try), 4 times or 5 times (if a tie).
- One board has 9 units of grid
- One game result will generate 0 (if lost) or 1 (if winning) gift
- There can be 1 (in case of human vs computer player game) or 2 (in case of human vs human player game) players in a game with 1 board.
- Only the first player is allowed to choose the game level.
- Similarly only first player is allowed to select the marker type.
- A player will be given 0(if lost) or 1(if won) gift.

1.4 Domain Model