



Design of an Expert System Coach for Complex Team Sports

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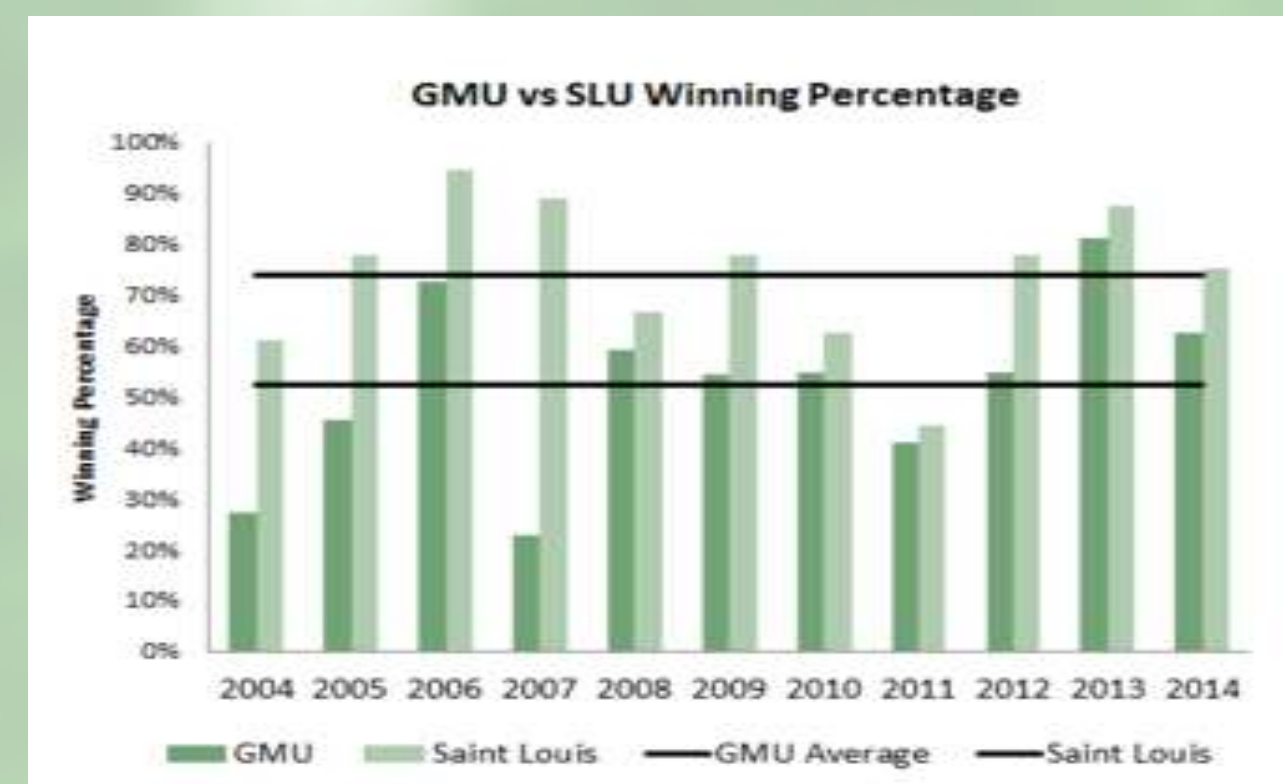


Context

Complexity of Soccer:

- Players have to adapt to the situations around them because there are no instructions or stoppages until halftime
- Network Complexity of Soccer: Netcentricity

Gap Analysis



Replicate Saint Louis Success By:

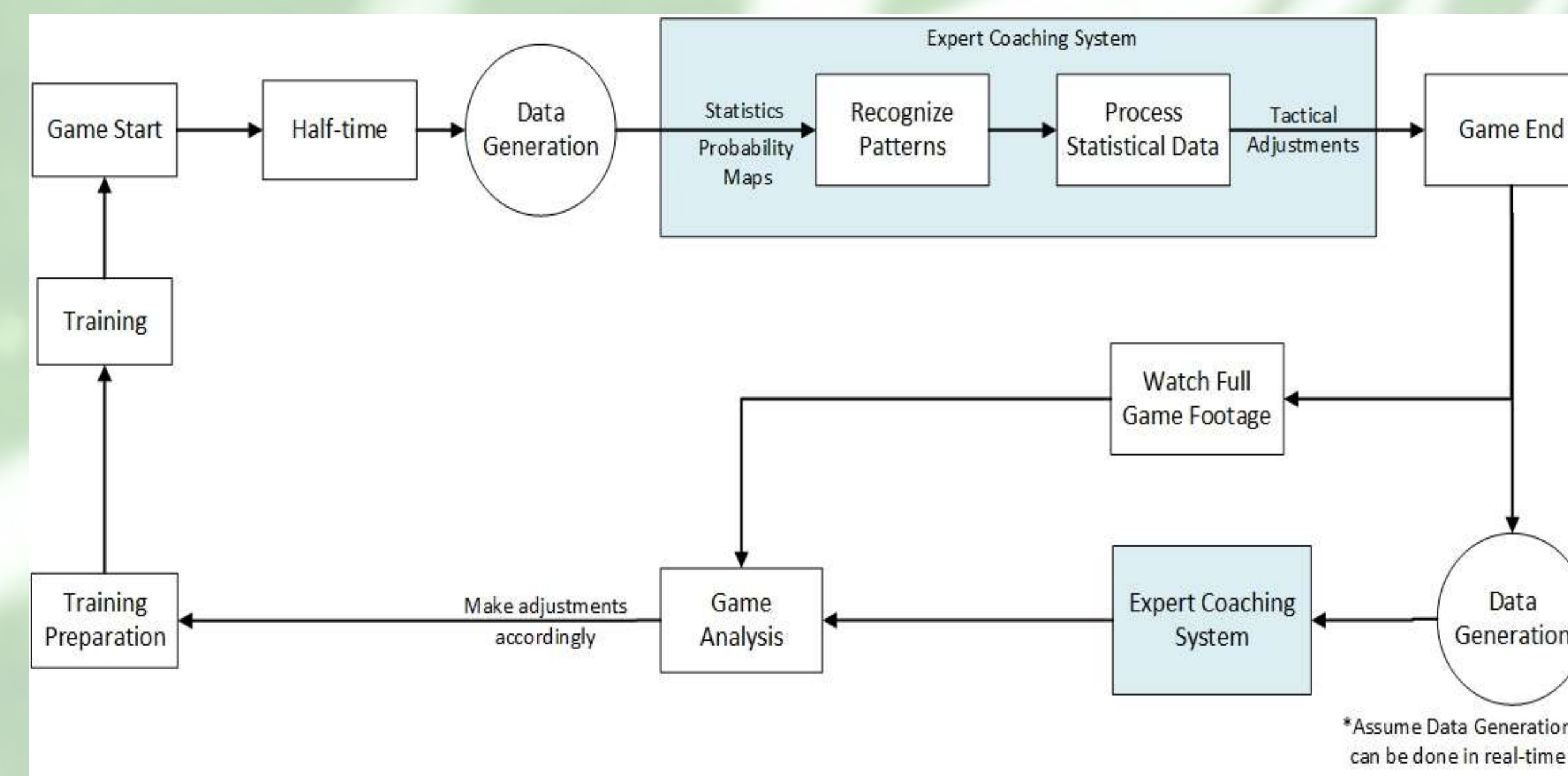
- Win Atlantic 10 Conference Championship 2 times every 5 years
- Receive an NCAA Bid 6 times every 10 years
- Average RPI Score of .56

Resulting success will help close head coaches salary gap of \$67,00

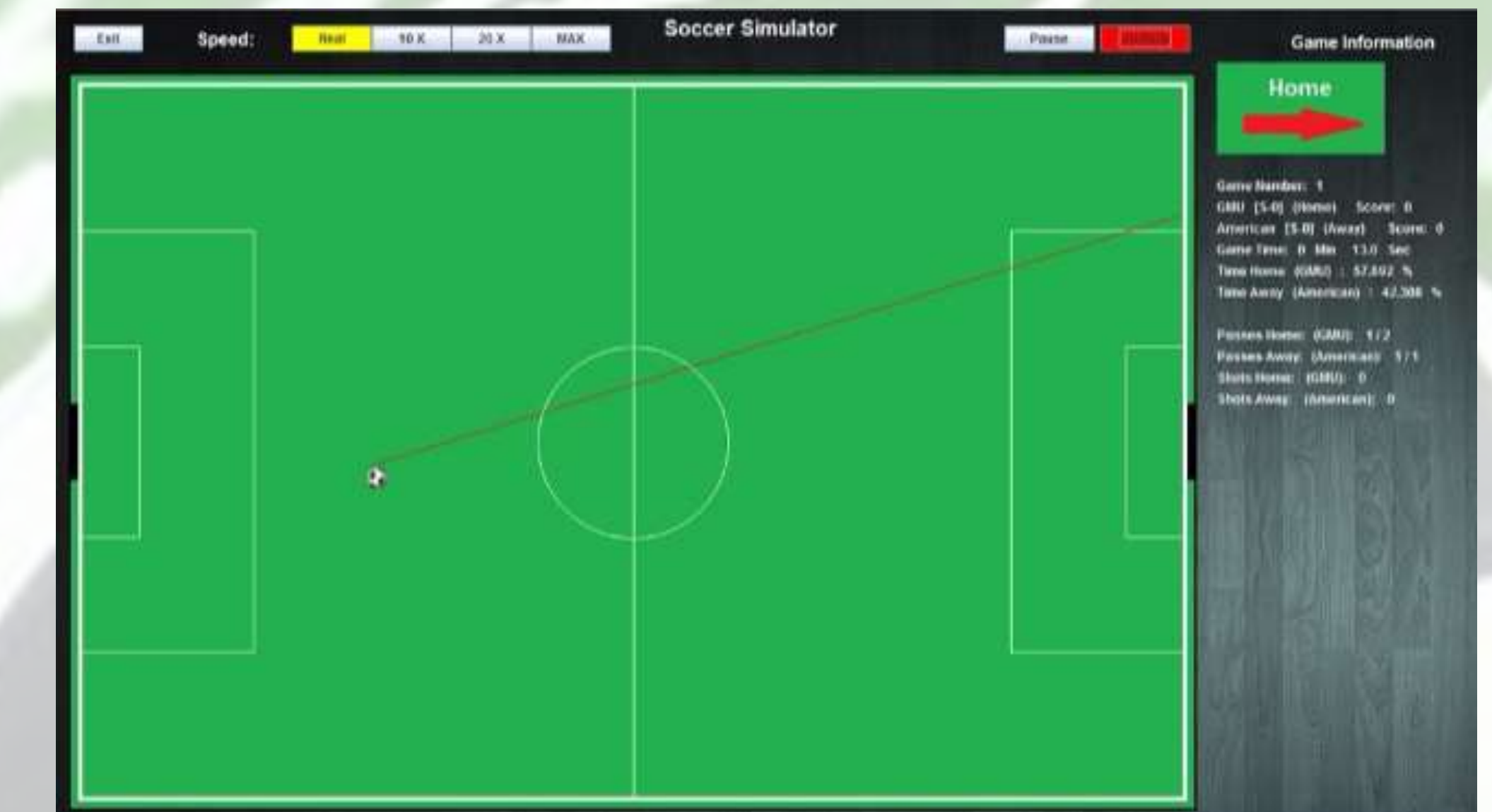
Problem Statement: George Mason University Men's Soccer Team is not consistently achieving NCAA Tournament bids at a high rate (2 bids out of last 10 years).

Need Statement: There is a need for a coaching tool that uses coaching expertise and uses soccer game data to understand the complexity of soccer and seek a competitive advantage in order to increase the probability of an NCAA Tournament bid to 3 bids out of every 5 years.

Concept of Operations



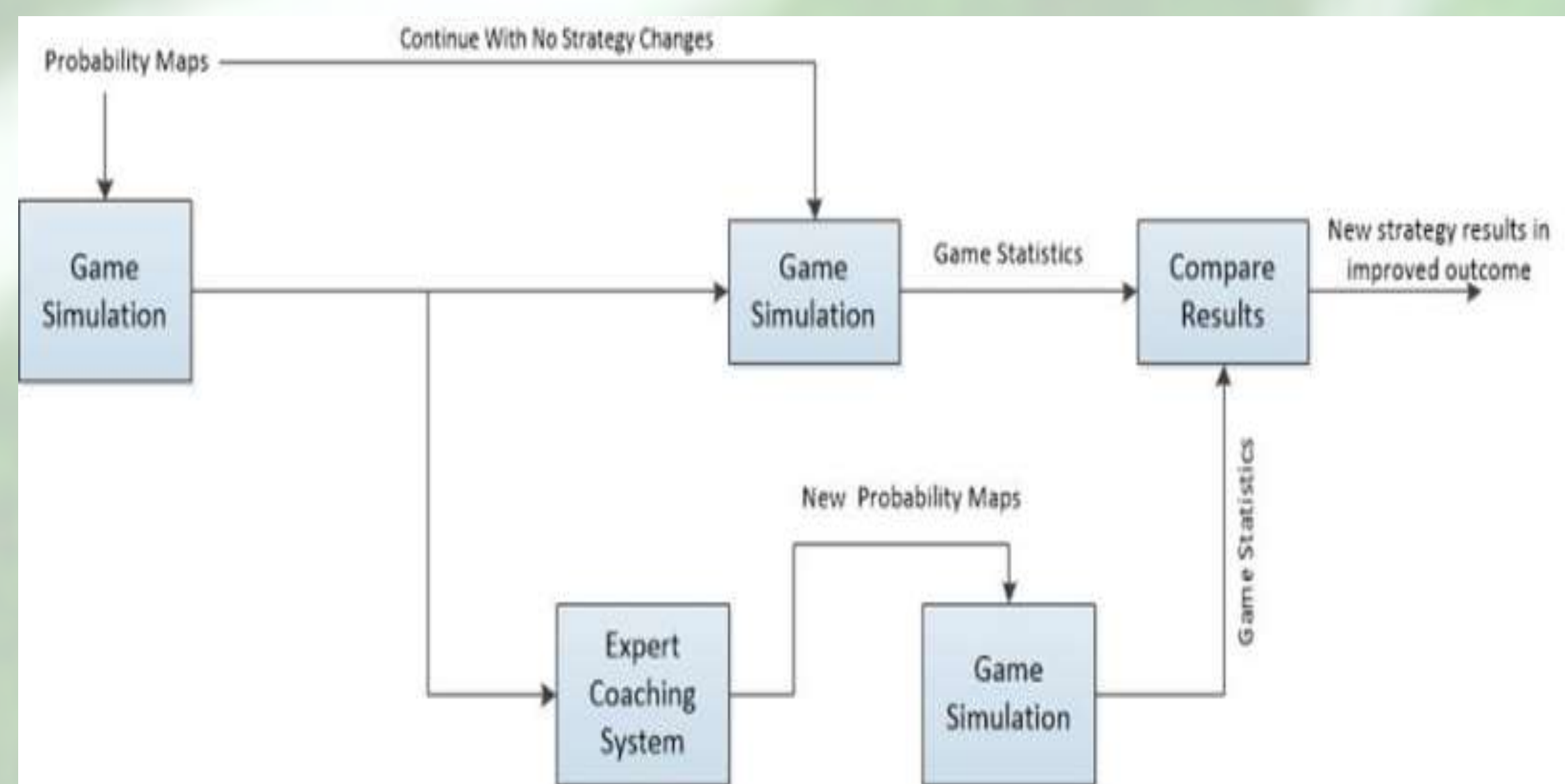
Simulation



Objective: To simulate a game based on game data and see if the coaching system rules will impact the outcome of the game. Simulates a 90 minute game (two 45 minute halves) using passing probability maps to represent different strategies of the game

Results

Validation of Concept of Operations



- In order to validate the system and the results, the game is played with and without the use of the expert coaching system and results are compared

Time	From Zone	To Zone	Possession	Action	Successful
80:08	7	6	Home	Pass	Yes
80:10	6	7	Home	Pass	Yes
80:11	7	7	Home	Dribble	Yes
80:15	7	10	Home	Pass	No
80:17	10	13	Away	Pass	No
80:21	13	13	Home	Dribble	Yes
80:25	13	14	Home	Pass	Yes
80:29	14	14	Home	SHOT	GOAL

- Example output from simulation that will be summed and compared using the validation.

Recommendations

- Based on the results, the expert coaching system increases the probability of GMU Men's Soccer Team by XX% and should be implemented
- This increase in win probability results in XX NCAA bids over the next 10 years
- This will close the gap with Saint Louis University and make GMU a top contender in the Atlantic 10