FC Everton Task

1) Overview:

There is a Bid by top 6 teams for Michael Keane. The aim is to study the performance of Michael Keane and other players to evaluate the performance

2) Approach:

The following are the objective

- Contribution of Michael Keane to the team to be judged by various parameters
- Sell/Keep decision to be made accordingly
- An alternative to be suggested in case of a sell decis**ion**

3) Analysis:

The analysis is divided into 3 sections :

Level 1: We will analyze his performance across the season, match-by-match and see how he has performed. This is done to check the consistency and season-long performance over several parameters and will track his performance against a different set of clubs to identify trends.

Level 2: We will compare his performance to other Central Defenders in the team to see how they are performing.

Level 3:
We will also compare his problem with other Central defenders in the leagues to see how everyone is performing

4) Inferences:

- Performance-based on metrics
- Performance Compared to other defenders in Everton FC and other teams
- On Squad Compatibility

The Analysis of the Central Defender:

Level 1 Analysis: Analysis of Michael Keane

For Analyzing Michael Keane and Other CBs, we have put the metrics into different categories

- Overall Score
- Positioning and Aggressiveness
- Aerial and set-piece ability
- Passing Ability and style

Passing Map of Michael Keane

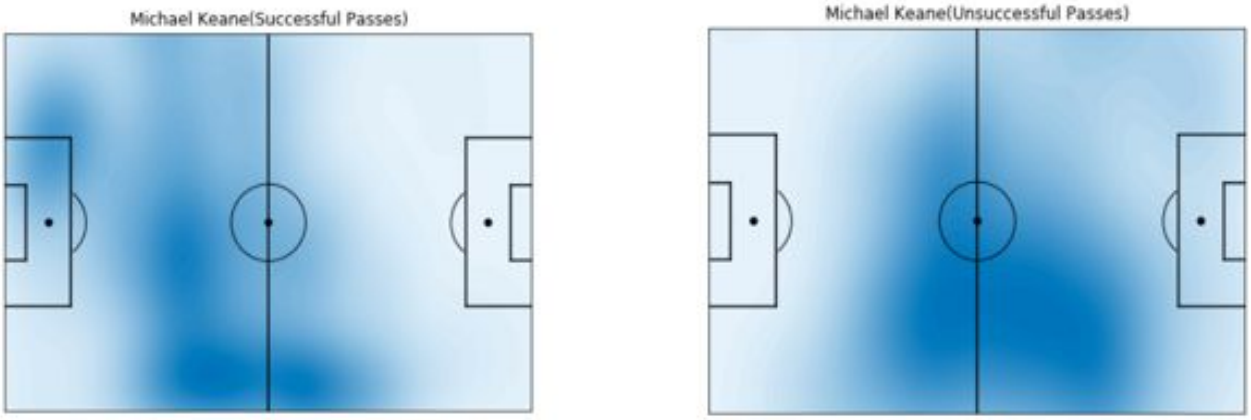
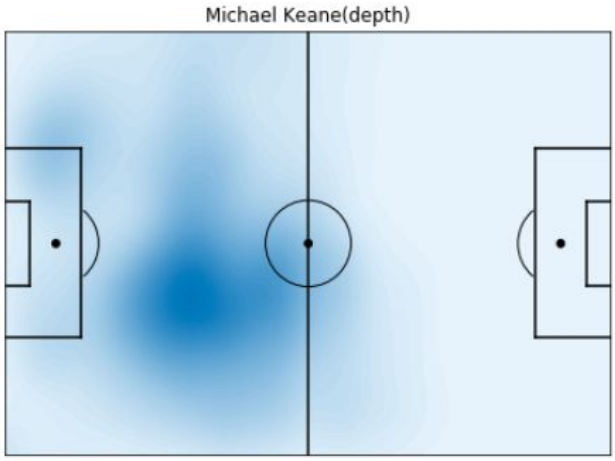


Fig. 1. Successful passes 2. Unsuccessful

On the left, that is a successful passing map and on the right is unsuccessful. As we can see that the pass on the high pitch are less successful and the majority of the passes are directed towards the right side of the field

Heatmap on the pitch: where does he play



Keane prefers his side of the right side centre back, he prefers to go straight ahead instead of getting dragged to wings

Passing

1. Passing style

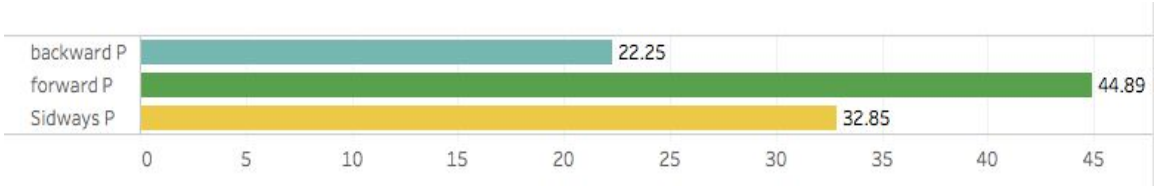


Fig. showing the passing style of Michael Keane

Attributes	Average	Kurt Zouma	Mason Holgate	Michael Keane	Phil Jagielka	Yerry Mina
Defensive Duel	7.6	5.4	8.3	9.3	7.4	7.5
Interception	0.9	1.6	0.7	1.3	0.5	0.6
Successful Tackle	0.7	0.6	0.7	0.7	0.9	0.7
Aerial Duel	6.6	4.8	6.5	9	6.5	6.1
Blocks	0.6	0.6	0.5	0.7	0.2	0.9

Considering all the parameters of Keane and comparing it to other defenders in Everton FC, we see that

- **Keane** on average goes more into defensive duels as compared to other defenders in the team showing an aggressive side. He also has tackle rate of 0.7 per 90 min, while he has the highest aerial dual rate in the team
  *He plays on the front food combining interceptions and duels

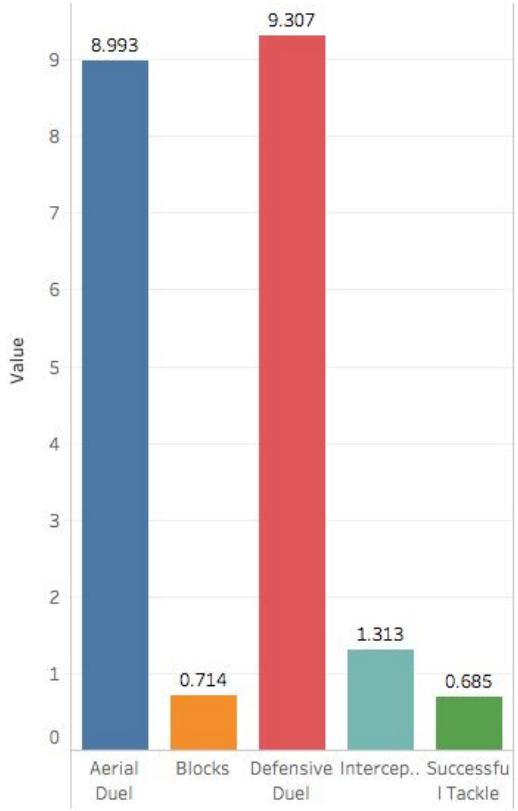
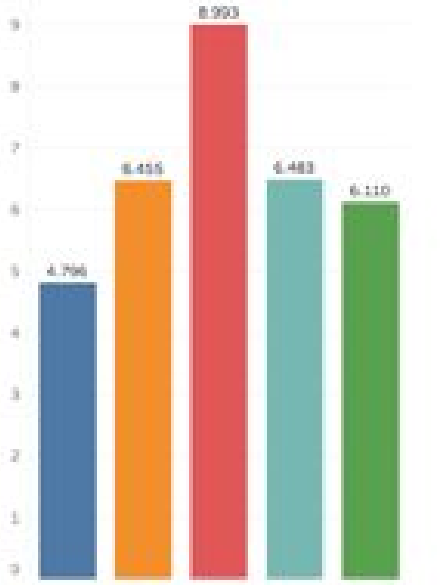


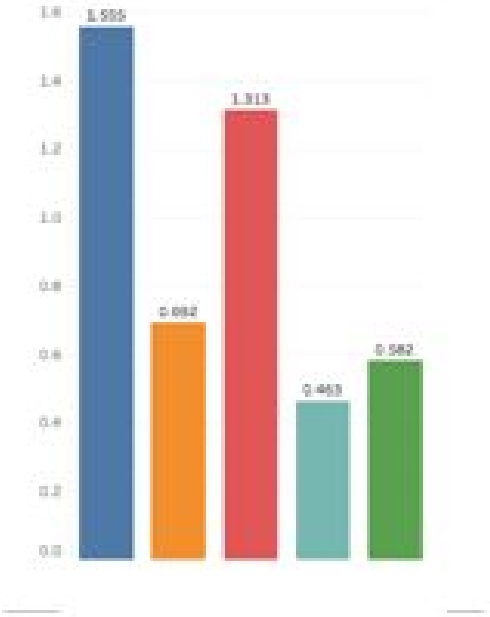
Fig. Showing the different attributes of Michael Keane

Level 2 Analysis : Analysis of Michael Keane with other Defender in the team

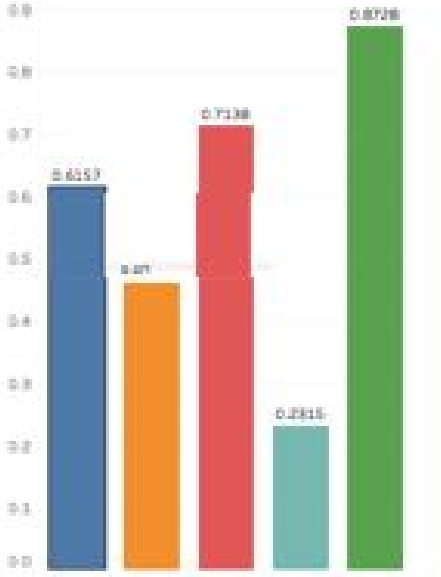
Average Aerial Duel per 90



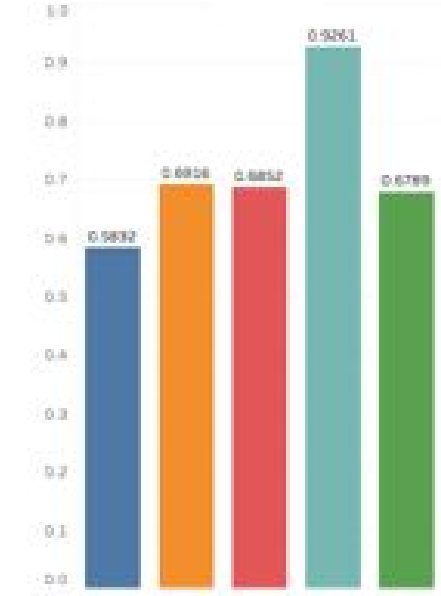
Average Interceptions Duel per 90



Average Blocks Duel per 90



Average Successful Tackle per 90



Kurt Zouma
Mason Holgate
Michael Keane
Yerry Mina
Phil Jagielka

Range of Passing

Center-backs find themselves in the middle of the pitch most of the time when in possession. They are the building blocks when maintaining possession and starting the attack from the back. They need pLayer to have quarter-back abilities to find a pass, whether it's a short one to a midfielder or a long pass in behind the opposition's defensive unit. Since central defenders are in the middle of the pitch, they need to be technically able to switch the play with a pass in a variety of ways

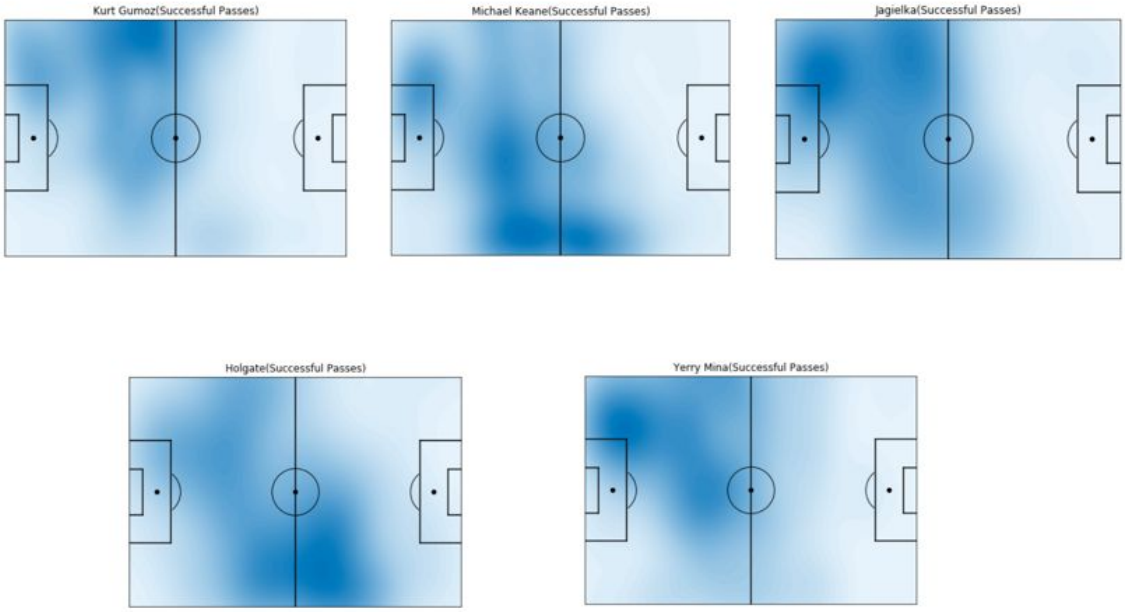


Fig. Top row 1. Kurt Zouma 2. Michael Keane 3. Phil Jagielka
Second row 4. Mason Holgate 5. Yerry Mina

Passing style of each player

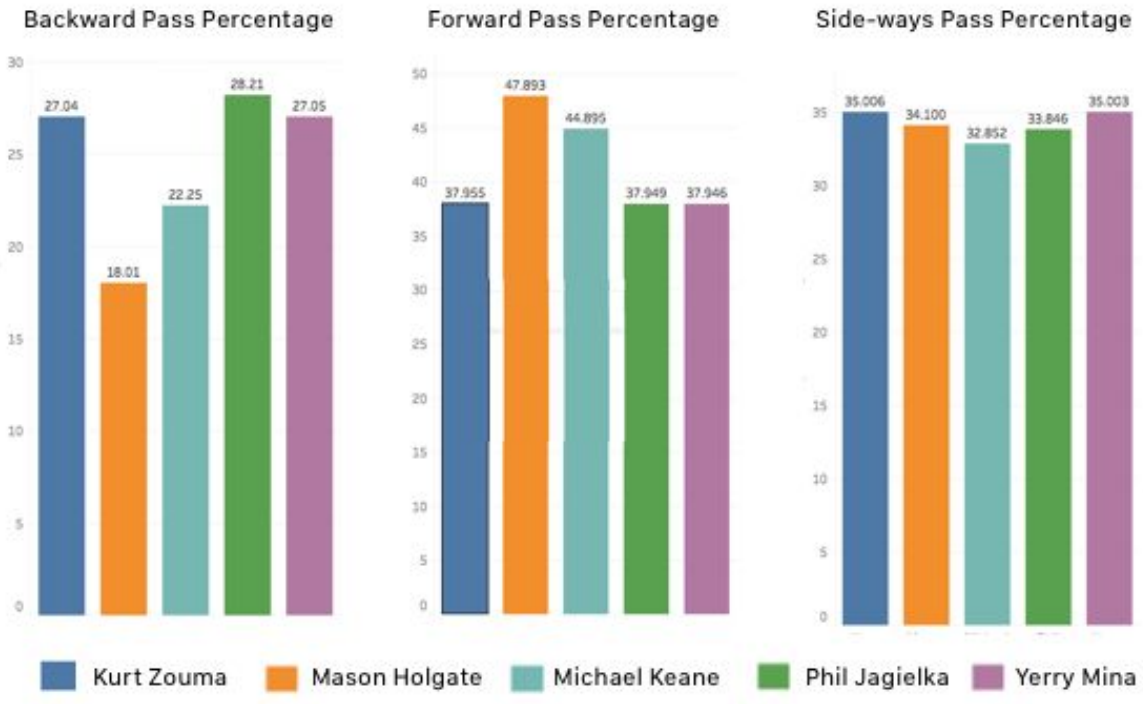


Fig. Different passing style of each player

Depth of each player

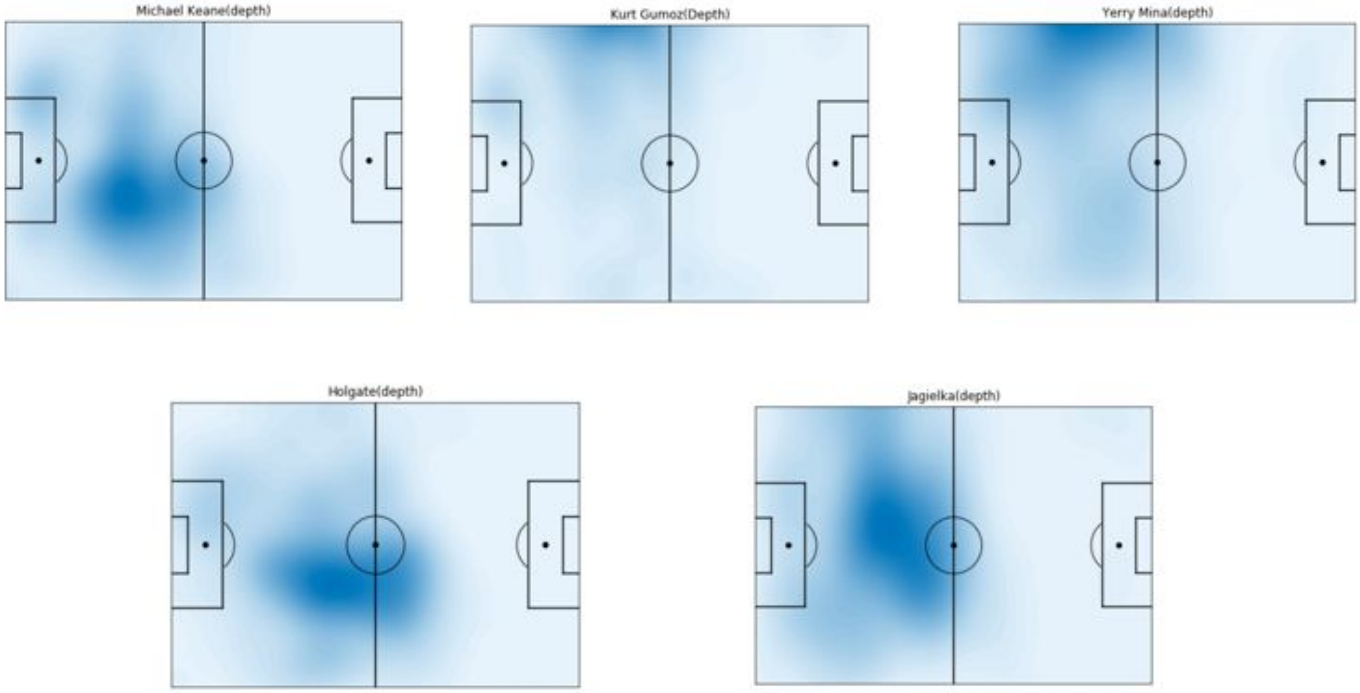


Fig. Top row 1.Michael Keane 2. Kurt Zouma 3. Yerry Mina
Second row 4. Mason Holgate 5. Phil Jagielka

How the attributes are related

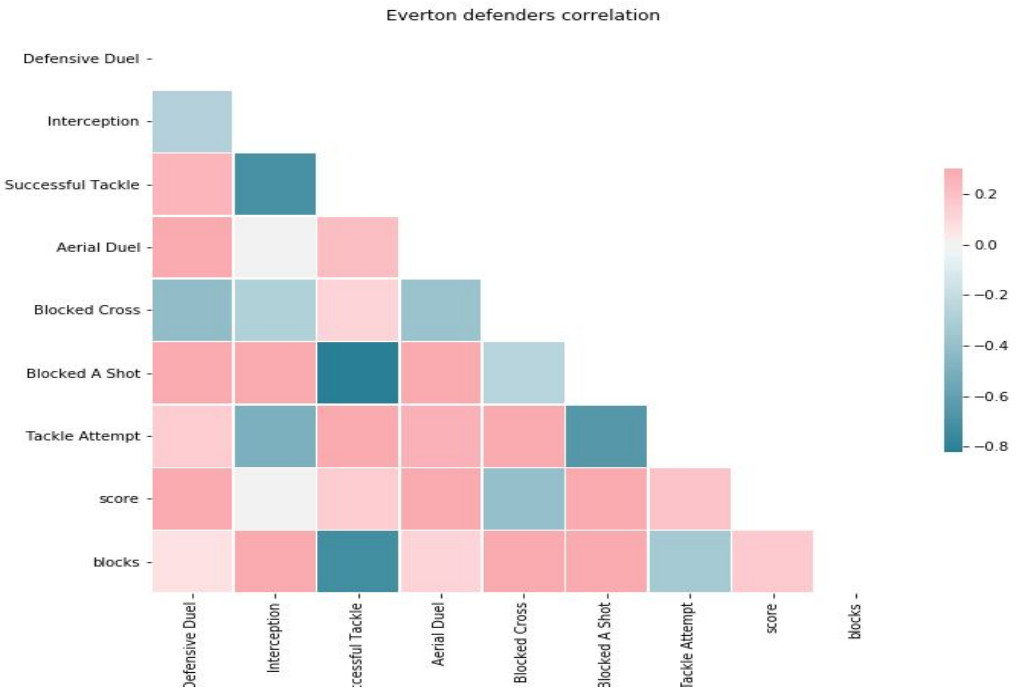
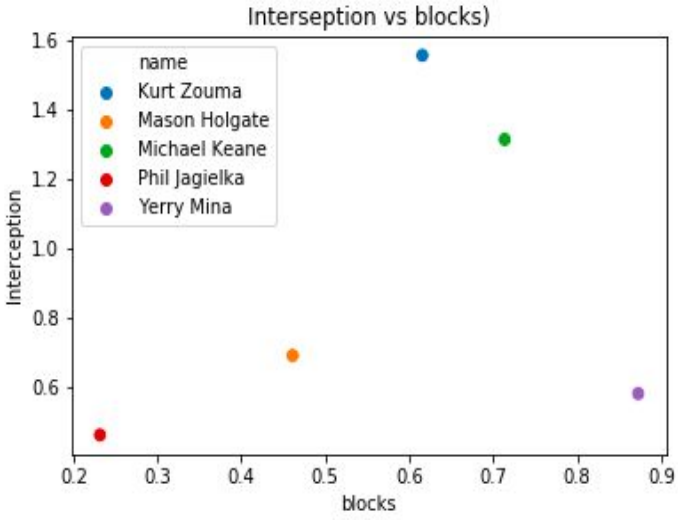
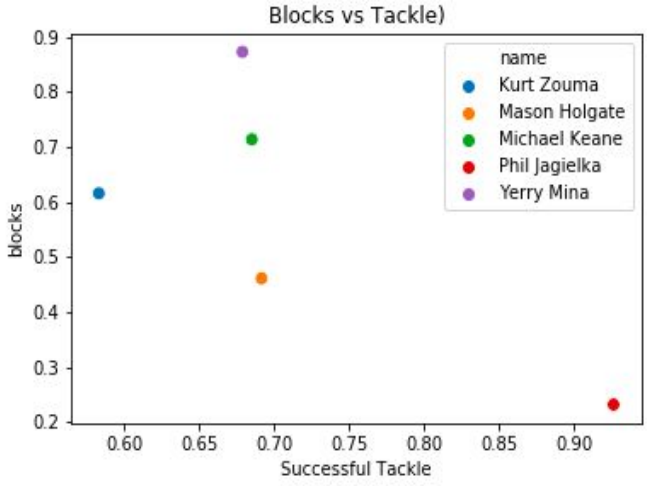
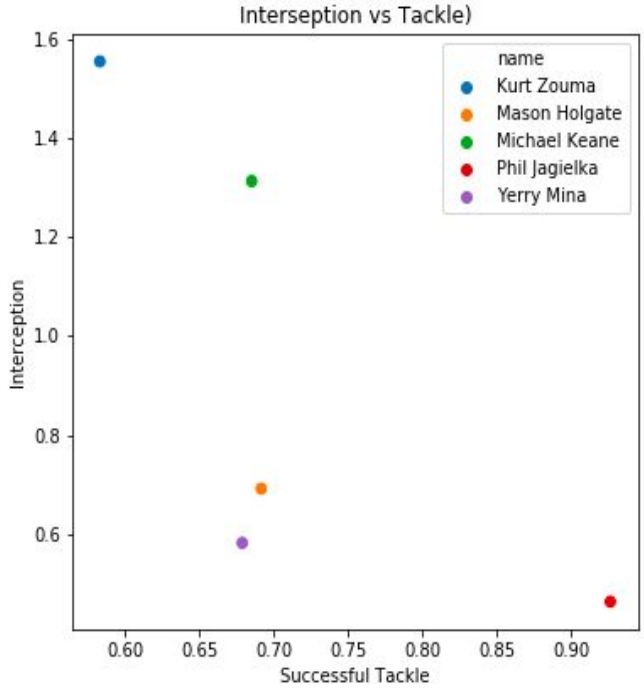


Fig. Correlation between different attributes

The variation of Blocks, Interception with Tackle

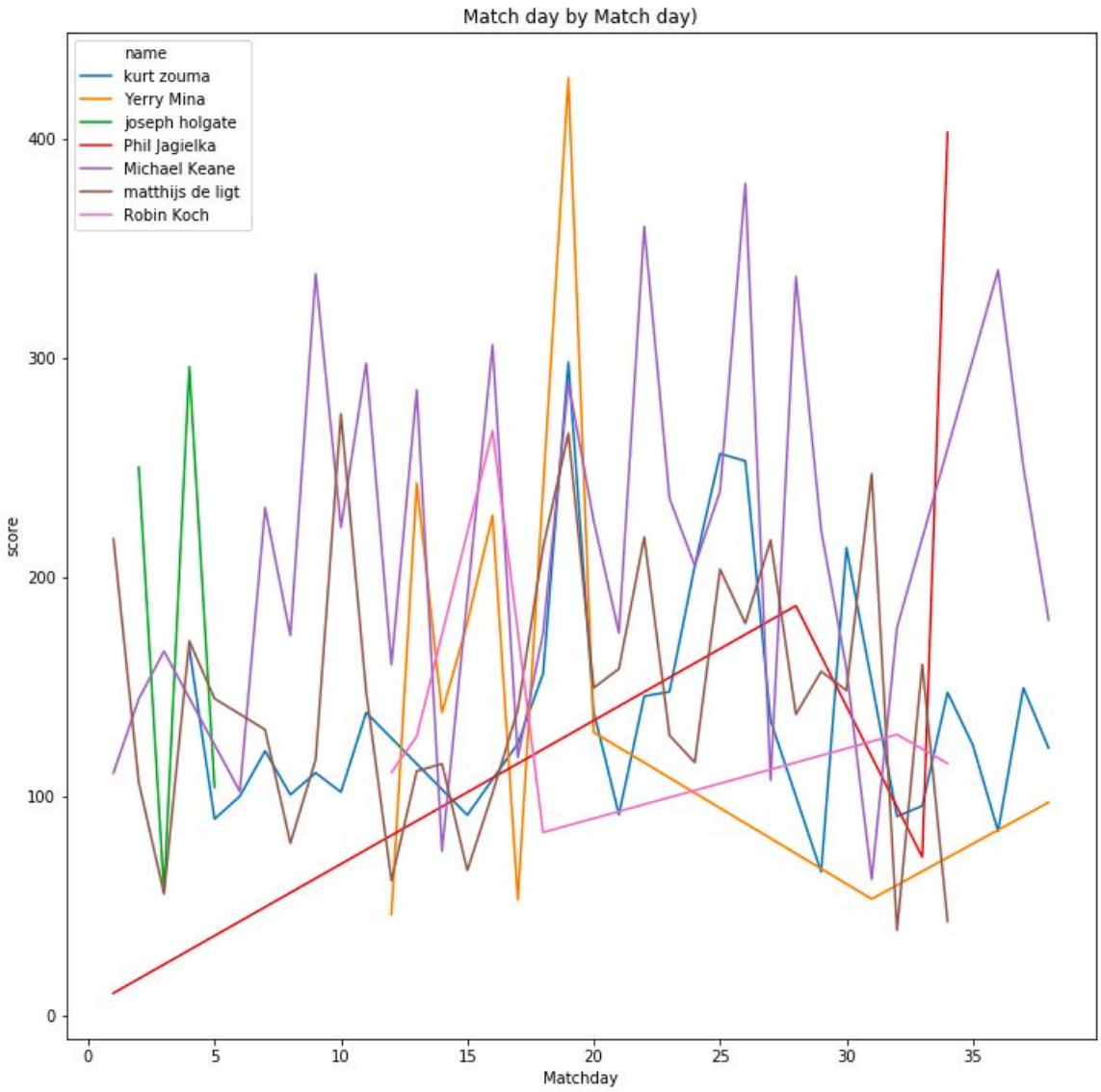






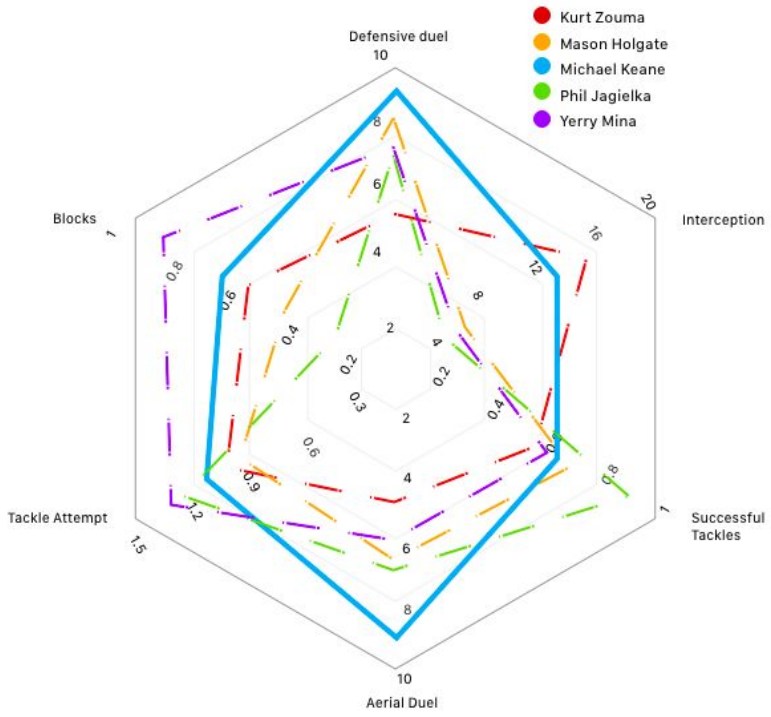
Level 3 Analysis :

A. comparison of different players; By Match and By overall



The score consistency across the season show that Keane has been the mainstay of the team with different players excelling sporadically. Thi shows that he has been the most important defender in the team

- ## Radar Graph of players



1) Based on Analysis of Michael Keane with other Defender in the team he comes out as the best performer when compared through the chosen parameters
2) Keane's passing distribution heat map shows that apart from holding the ball at the back he tries to attempt a lot of forward play which includes decent number of long balls
3) Keane's position is closest to the ideal player position in the Interception vs Block, Interception vs Tackle and Tackle vs Block charts
4) Keane comes out as the most consistent player when compared on the basis of score per game through the season
5) In the overall comparison hexagon chart, only 6/24 data points lie outside Keane's hexagon stating Keane to be the most wholesome defender in the team

Verdict - Don't sell Keane for 40Mill. One reason Keane can be sold is to find a player with similar attributes for a much lower price so the transaction ends up in monetary profits and no loss in player quality.

Similar Player to Keane :
Matthijis de Ligt : It will be difficult to buy him as the prices are higher
John Stones : It will be difficult to buy a player from a top 6 club
Robin koch : This is a young player showed improvement in the performance so if any how Keane leaves the club, Robin koch should be bought.

Data Modelling :

Scoring Model:
The aim is to create a defensive score of each player match-by-match as well as the individual score across the season. The attributes chosen are the must have for the Central Defender. I have not included the attributes which are good to have.

Each attributes is alloted a score based on the wieghted mean to compete the score. This is done to give the relative importance to each attribute

1. Defensive Duel 10.0
2. Interception 09.3
3. Successful Tackle 10.0
4. Aerial Duel 08.7
5. Blocked Cross 06.0
6. Blocked A Shot 07.7
7. Tackle Attempt 07.3
8. Ball Recovered 07.7

K-Means clustering :
In this clustering, the players were grouped together in a way that objects in the same cluster are more similar to each other than to objects in other clusters. Similarity is a metric that reflects the strength of relationship between two data objects.

Cosine similarity
It is a measure of **similarity** between two non-zero vectors of an inner product space that measures the **cosine** of the angle between them. Each player is considered a vector and the similiarity of each vector is taken out with Michael Keane. This method is
Is then supported by the Eucledian distance method considering its a higher dimension analysis. For cosine similiarity , if the value is high then it means the anle between the vectors is less and they are most similat whereas in eucledian distance, lesser the distance similar the player

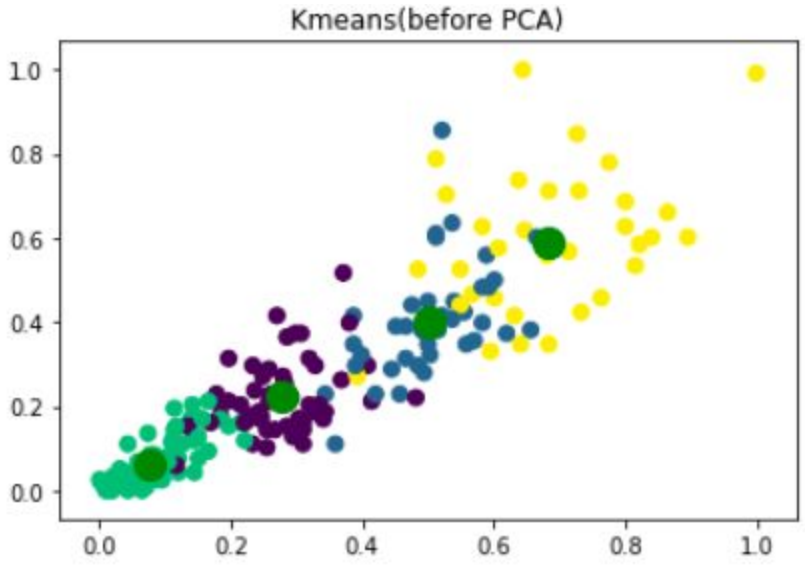


Fig. Clustering of the players based the attributes

Principal Component Analysis is a Linear dimensionality reduction using Singular Value Decomposition of the data to project it to a lower dimensional space. The input data is centered but not scaled for each feature before applying the SVD.

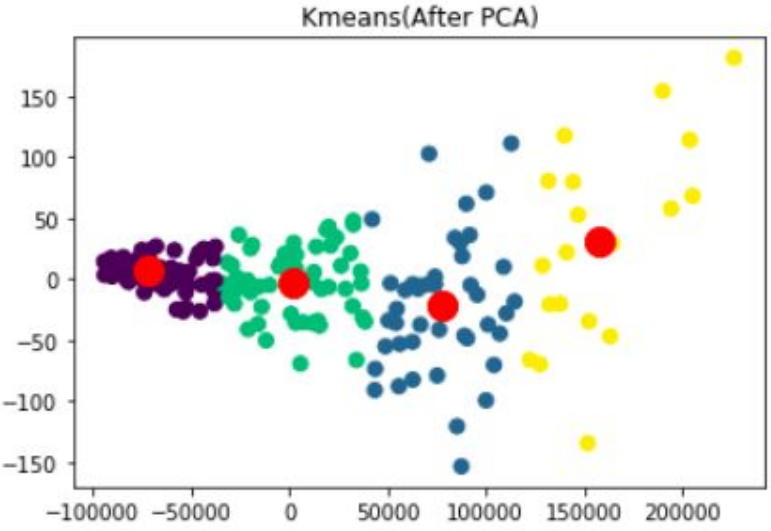
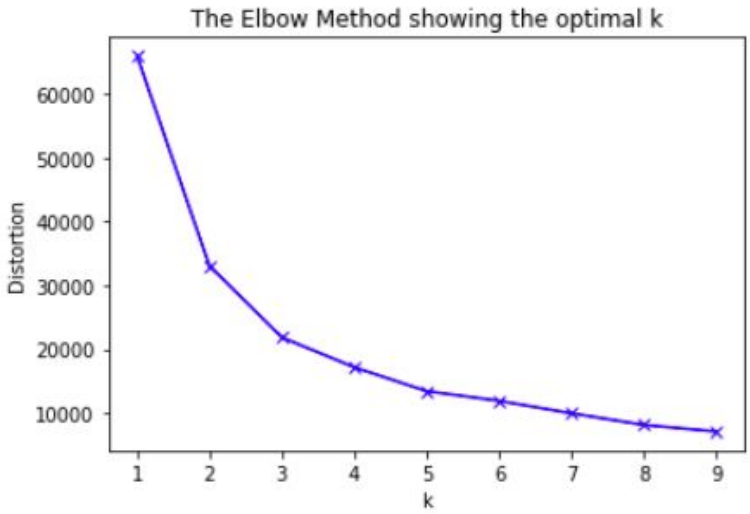


Fig. Clustering of the players based the attributes after the PCA

Choosing the optimal K



Things That can be done as to do list :

1. The game date can be used to compare performances in the first half of the season vs the later half
2. away data can be used to compare home/away setup of the team
3. If we can get team rankings then we can judge players performance against the top half vs bottom half
4. X, y can be used in a predictive model to see how the teams/player are converting their chances from a particular position. A better idea of how the team is playing. we can draw the heatmap of the accurate passes for each player
5. Passing map Network analysis can be done to see the which player passes to which player the most and where are they stationed every match