

A photograph of a football player in a yellow jersey and black helmet, seen from the side and back, preparing to throw a football. He is wearing white pants with a Nike logo. The background shows a football field with other players and spectators.

Predicting NFL Quarterback Completions

Scott Okamura

01

THE NFL



NATIONAL FOOTBALL LEAGUE

\$15.26 billion

Average franchise value

\$3.04 billion

Source: Statista



HIGHEST PAID QUARTERBACKS IN 2020

PATRICK
MAHOMES
**\$45
million**

JOSH
ALLEN
**\$43
million**

DAK
PRESCOTT
**\$40
million**

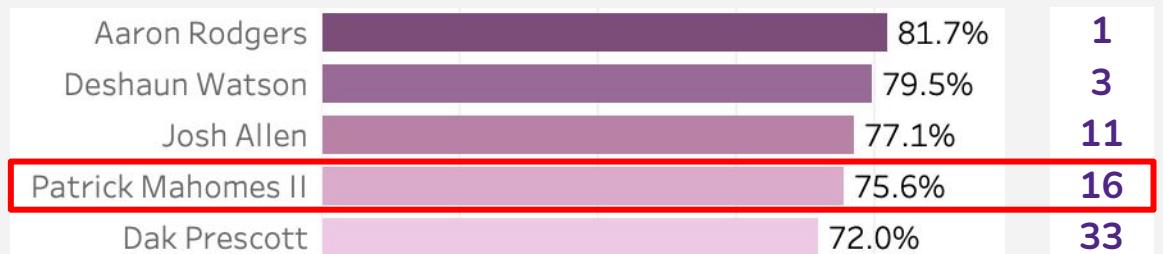
DESHAUN
WATSON
**\$39
million**

MVP
**\$33
million**



WORTH THE MONEY?

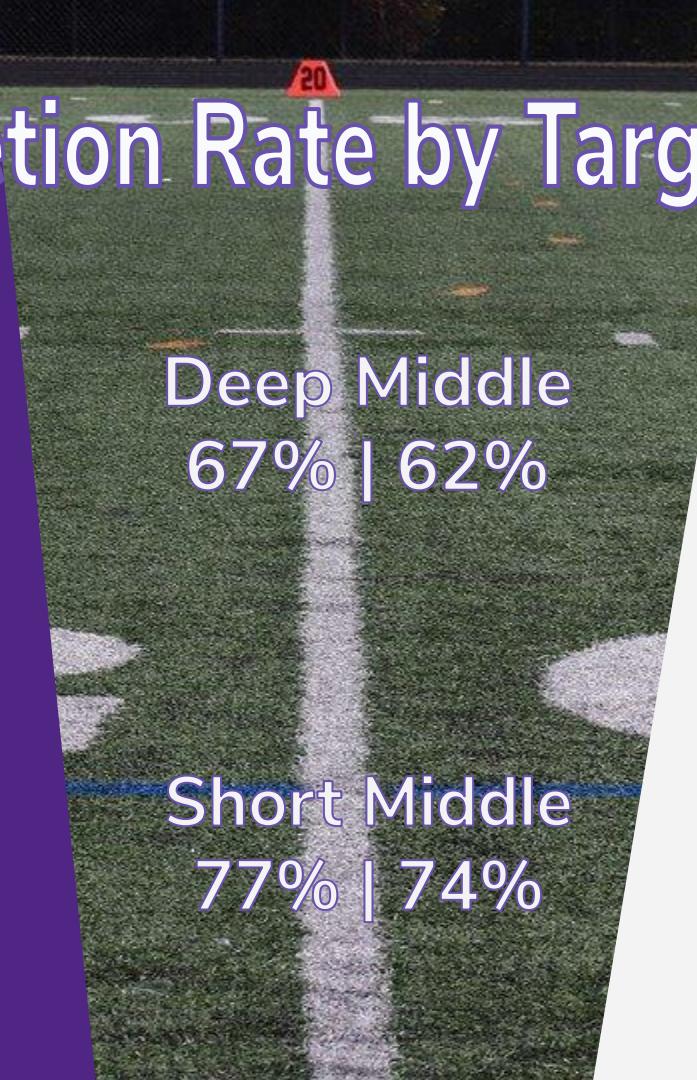
Completion Rate



League Average



Completion Rate by Target Area



Deep Left

Short Left
79% | 77%

Deep Middle
67% | 62%

Short Middle
77% | 74%

Deep Right
49% | 50%

Short Right
80% | 74%

A photograph showing a cluster of NFL footballs floating in a dark space. The balls are arranged in various layers, some facing forward and others showing their sides or backs. The lighting highlights the texture of the leather and the prominent white laces. The NFL logo is visible on each ball.

02

BUSINESS CASE

Bottom Line

\$200 million



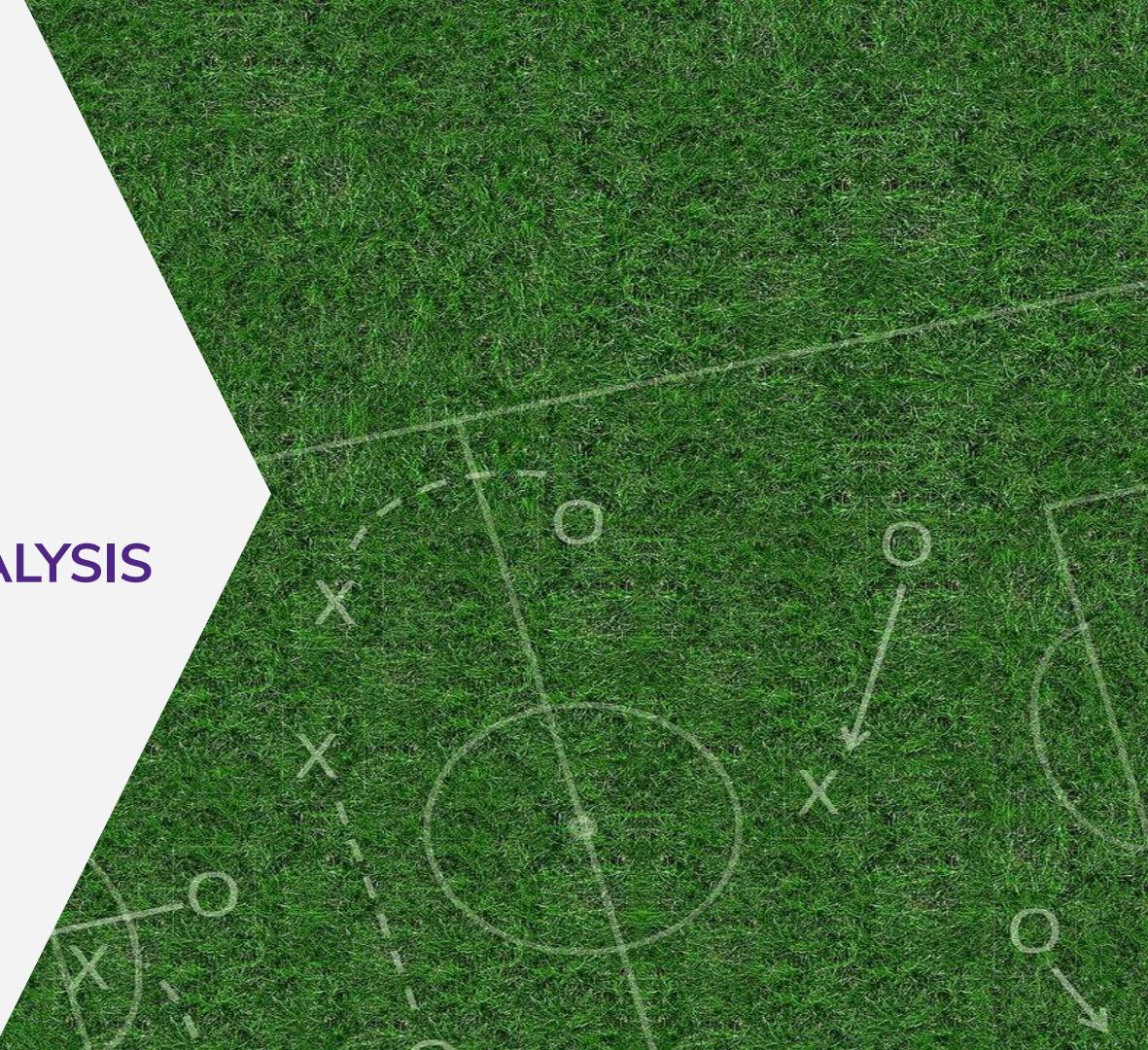


Research Question

Based off of the current game situation (quarter, down, field location, etc), can you predict if the pass will be completed?

03

MODEL ANALYSIS



Model A

Logistic Regression w/ SMOTE

For analyzing
own team

Less false
completions

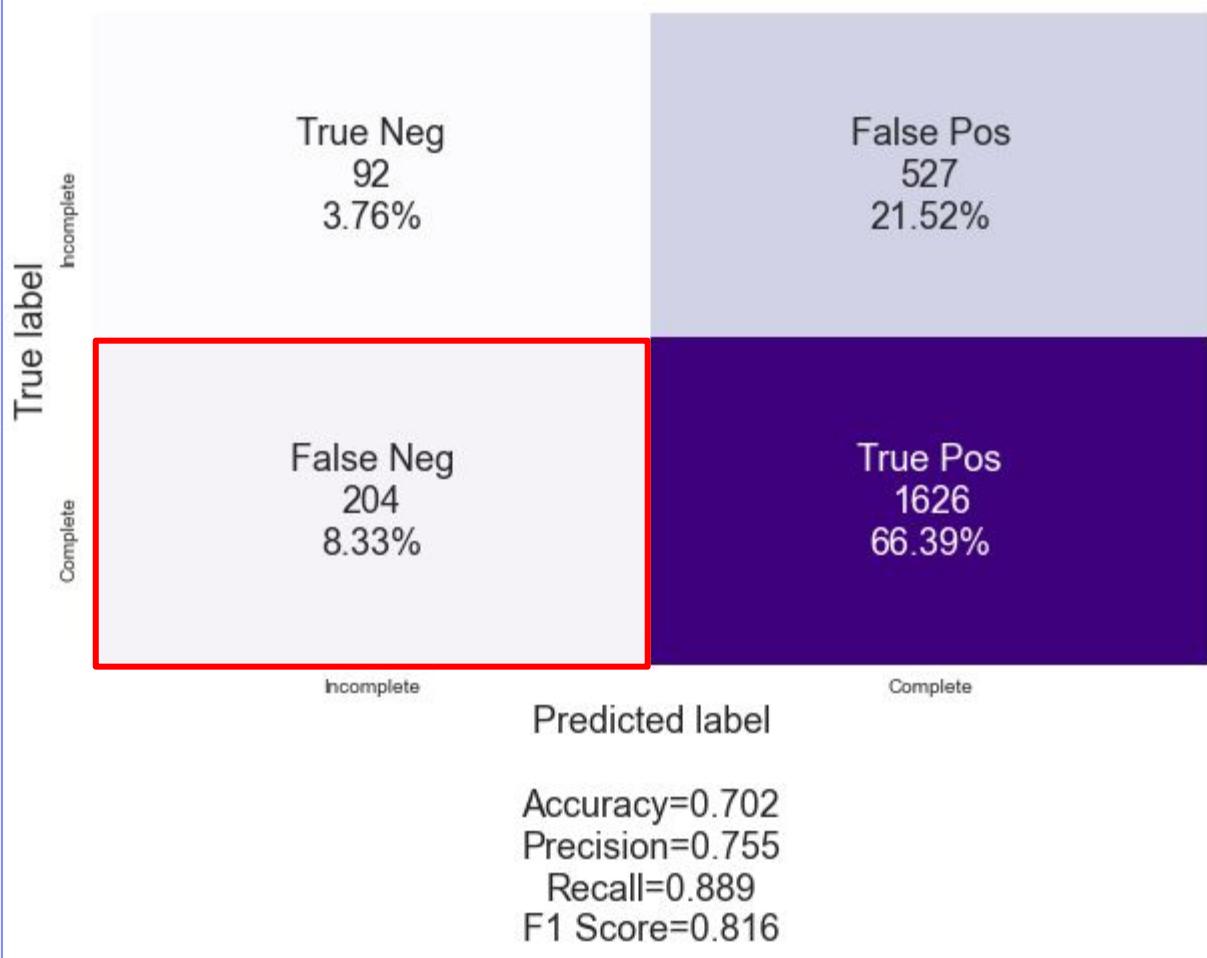


Model B

K-Nearest Neighbors

For analyzing
opponents

Less false
incompletions



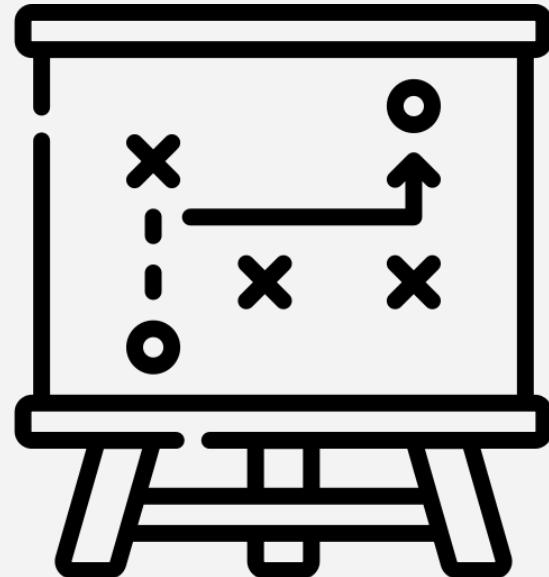
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Model A:

- Useful for team building
- Determine QB contract worth

Model B:

- Useful for game planning
- Watching opponent film





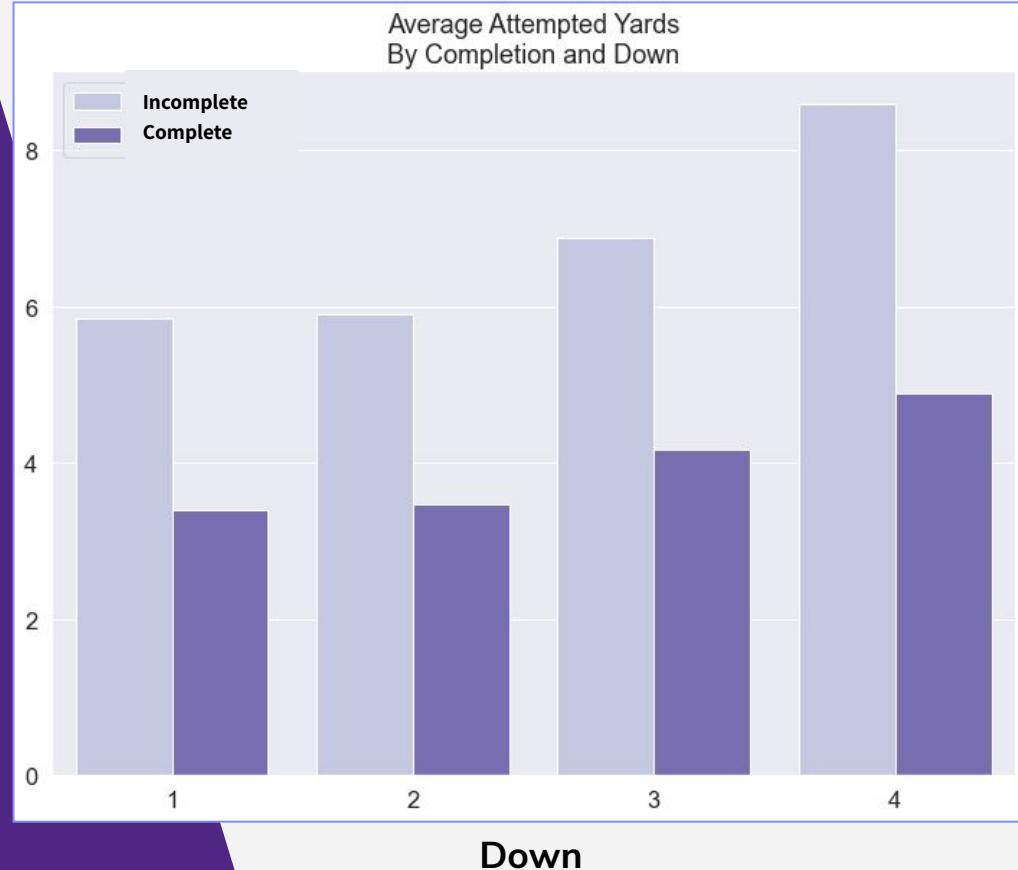
04

RECOMMENDATIONS

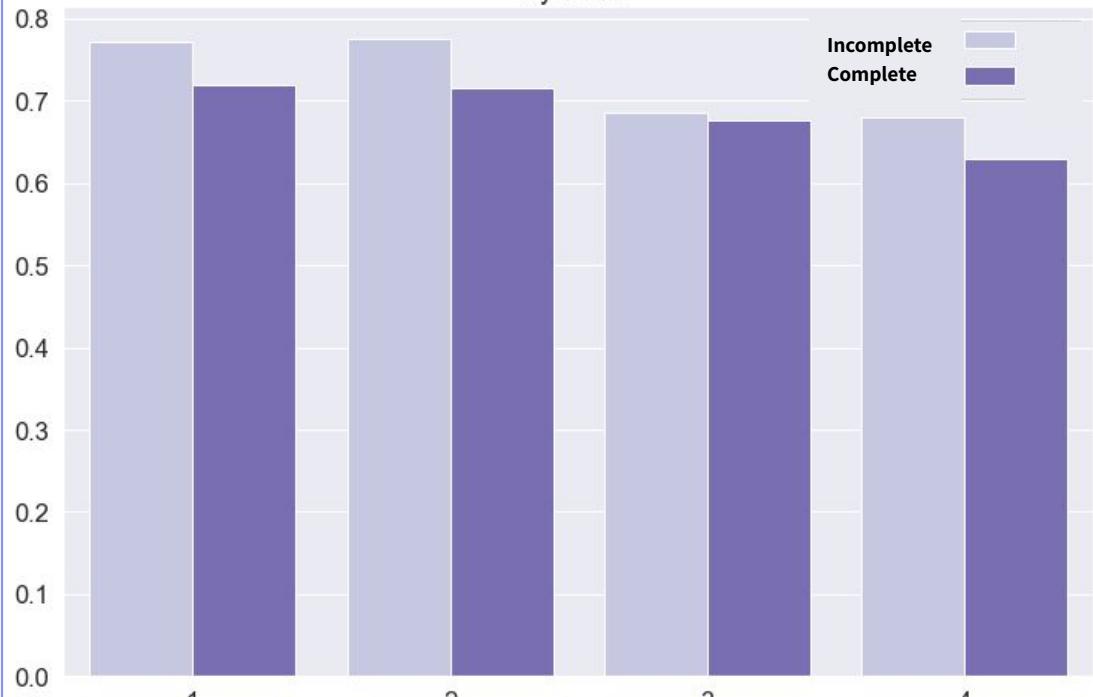
Target Distances by Down

Throwing on 1st and 2nd down:

- Highest priority receiver within 4 yards



Completion Rate Against Blitz
by Down



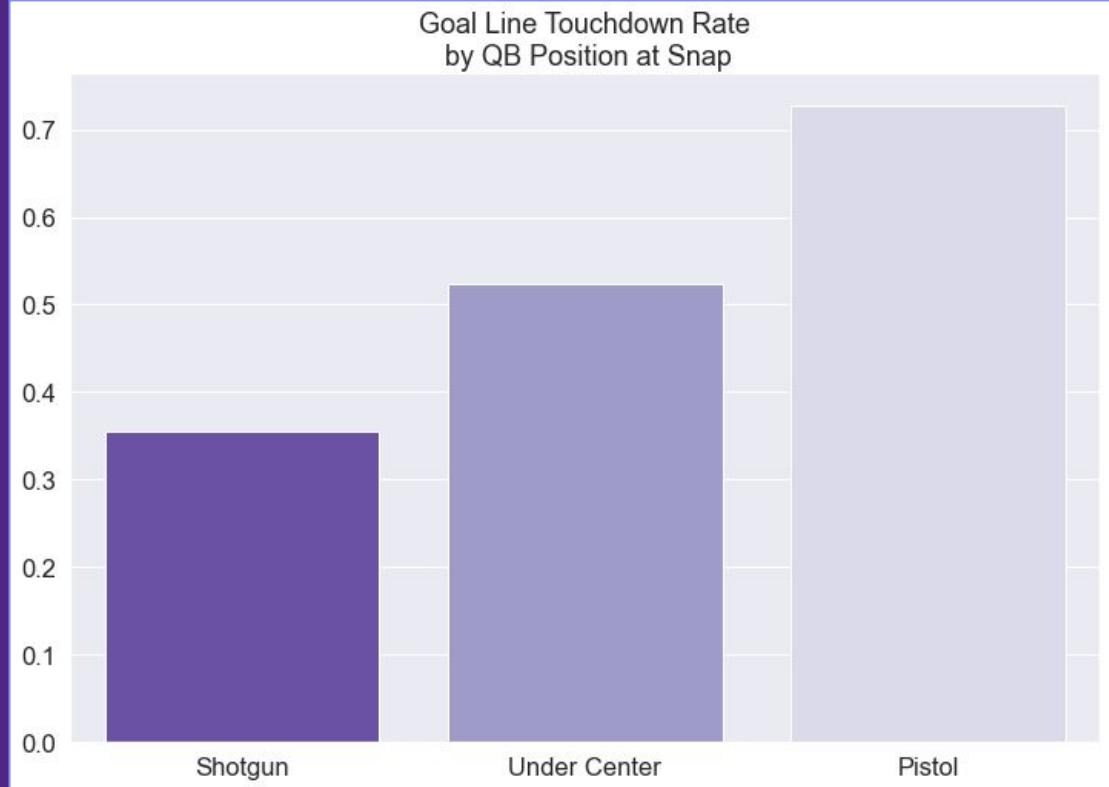
Selective Blitzes

Avoid blitzing on
3rd down

Play Formations at Yards-to-Goal Situations

Pistol >70% TD rate

Twice shotgun rate



05

FUTURE WORK



FUTURE WORK

Include Game Score

1

Pre-2020
Play-By-Play
Data

3

“Elite”
Quarterbacks

5

2

Home Field
Advantage

4

Include
Receiver and
Defense Data



THANK YOU

Questions?

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