



# Moneyball Metrics: *Exploring Power BI through MLB Player Analysis*



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# BLUF

- The DoD has a powerful new tool at its disposal: *Power BI*
- Has The DoD's *enterprise access* of Power BI changed how Cost Analysts do their job?
- *Exploration* of Power BI's potential usages and innovative ways to leverage its capabilities within the program office
- Analysis of raw *MLB* Player Contract, Salary, and Performance metrics to create visuals/analysis relatable to Cost Analysis within *Defense Acquisition*

*Note: We will be showcasing Power BI's functionality rather than teaching/demonstrating how to use the tool*



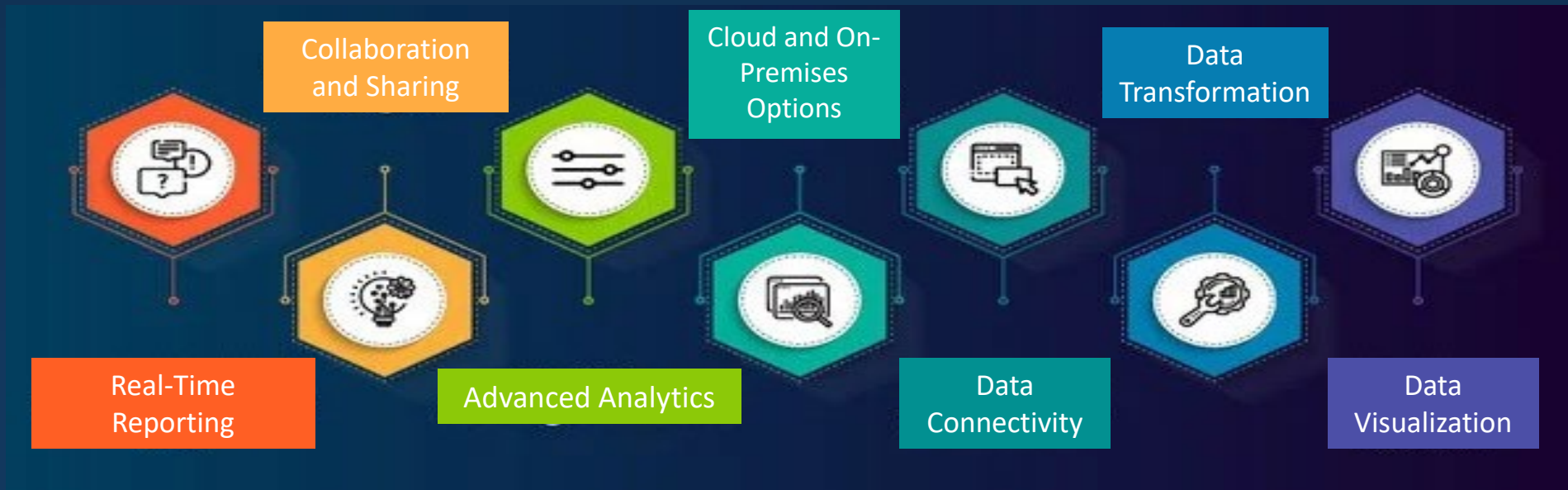
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    - Cost and Performance Metrics
  - **Contract Tracking**
- **The Wins and Woes of Power BI**



# What is Power BI?

- Power BI is a powerful business intelligence (BI) and data visualization tool developed by Microsoft
- It allows users to connect various data sources, process and analyze the data, and create interactive, visually compelling dashboards and reports
- Core Capabilities:



# History, Evolution, and Impact

## • History and Evolution of Power BI

Power BI developed and released under name "Project Crescent"

2010 - 2011

Continuous enhancements and additional Power BI services added

2015 - Present

2015

Power BI released to the public as stand-alone product

~2023

Widespread availability of Power BI within Defense Acquisition offices

## • Impact of Power BI for Cost Analysis

- **Transparency:** Providing clear visuals
- **Efficiency:** Reducing the amount of time spent on manual data prep
- **Flexibility:** Adapting to different cost analysis needs
  - from acquisition planning to sustainment modeling

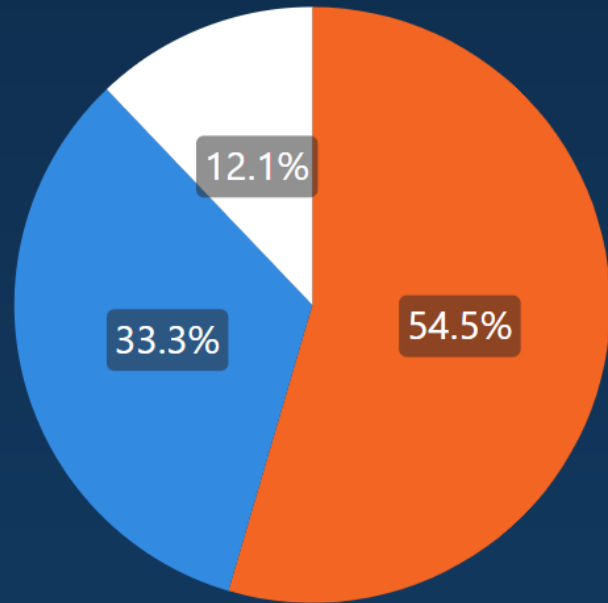
## *Historical Usage in Local Cost Community*

- **Are analysts using alternatives to deliver data backed analysis?**
- **Surveyed cost analysts within a wide range of Defense Acquisition programs**
  - What is your experience level with Power BI?
  - How often do you use Power BI?
  - What work activities have you used Power BI for?



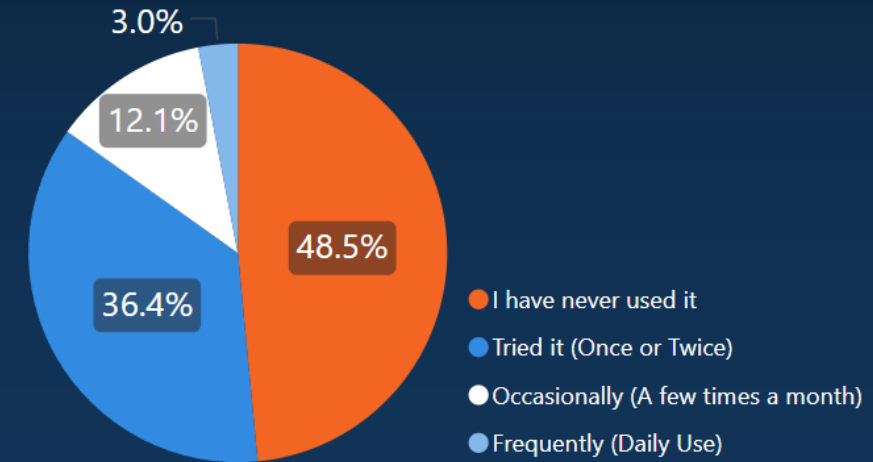
# Historical Usage in Local Cost Community: Survey Results

## What Is Your Experience Level with Power BI?



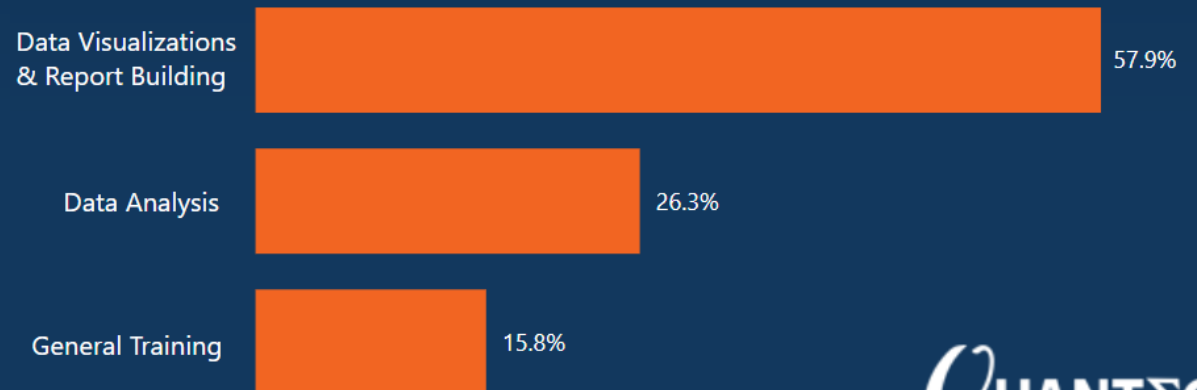
- I have no experience with Power BI
- I have had some training within Power BI
- I have used Power BI for work

## How Often Do You Use Power BI?



- I have never used it
- Tried it (Once or Twice)
- Occasionally (A few times a month)
- Frequently (Daily Use)

## What Have You Used Power BI For?



# Power BI Demo

The screenshot displays the Microsoft Power BI interface. At the top, the ribbon includes tabs for File, Home, Insert, Modeling, View, Optimize, and Help. The 'Insert' tab is active, showing options like 'Get data', 'Excel workbook', 'OneLake data hub', 'SQL Server Data', 'Enter data', 'Dataverse', and 'Recent sources'. Below the ribbon, the report canvas contains the text: 'Build visuals with your data. Select or drag fields from the Data pane onto the report canvas.' An illustration shows a hand dragging a field from a list into a dashed box representing a visual. A large orange-bordered box at the bottom of the canvas contains the text: 'Quick look at some key features essential to success in your use of Power BI.' On the right side, the 'Visualizations' pane is open, showing a search bar, 'Filters on this page', 'Filters on all pages', and a 'Build visual' section with various chart and table icons. Below these are sections for 'Values', 'Drill through', 'Cross-report', and 'Keep all filters'. The 'Data' pane on the far right lists various data sources such as '2024 Rosters', 'Batter\_Stats\_2024', 'Braves Historicals', etc. The bottom status bar shows several report pages, including 'Cost Analysis/Estimation - Contract Analysis', 'Salary Cost Analysis/Estimation - Contract ...', 'Cost Analysis/Estimation - Hist. Analysis', 'Cost and Performance Metrics', 'Cost and Performance Metrics Contd.', and 'Schedule Analysis'.

# Power BI Demo

**Importing Data Sources and Connections**

Build visuals with your data  
Select or drag fields from the Data pane onto the report canvas.

- Essential for bringing you external data source into your dashboard
- Allowing for connection and transformation of your data
- Serves as a starting point for almost all Power BI projects

# Power BI Demo

The screenshot displays the Microsoft Power BI interface. At the top is the ribbon with tabs for File, Home, Insert, Modeling, View, Optimize, and Help. The Home tab is active, showing various options like Paste, Copy, Format painter, and data sources. The main area is the report canvas, which contains a central instruction: "Build visuals with your data. Select or drag fields from the Data pane onto the report canvas." Below this is an illustration of a report canvas and a data table. On the right side, there are three panes: Filters, Visualizations, and Data. The Data pane shows a list of data sources including "2024 Rosters", "Batter\_Stats\_2024", "Braves Historicals", etc. At the bottom, the taskbar shows several open reports.

**Report View**  
**Table View**  
**Model View**  
**DAX Query View**

**Build visuals with your data**  
Select or drag fields from the Data pane onto the report canvas.

- **Report View:** Creating and viewing your interactive reports
- **Table/Data View:** Space to view your raw data imported
- **Model View:** Viewing and managing your relationships between your data tables
- **DAX Query View:** Where to create and work with DAX

# Power BI Demo

**Build visuals with your data**  
Select or drag fields from the Data pane onto the report canvas.

**Filters**  
**Visualizations**  
**Data**

- The **filters** area allows you to apply filters to your data to focus on specific information
- The **visualizations** area allows you to choose and customize the types of charts, graphs, and other visual elements in your canvas.
- The **data** area is where you can see and work with your raw data and fields

# Exploring Power BI Through MLB Player Analysis

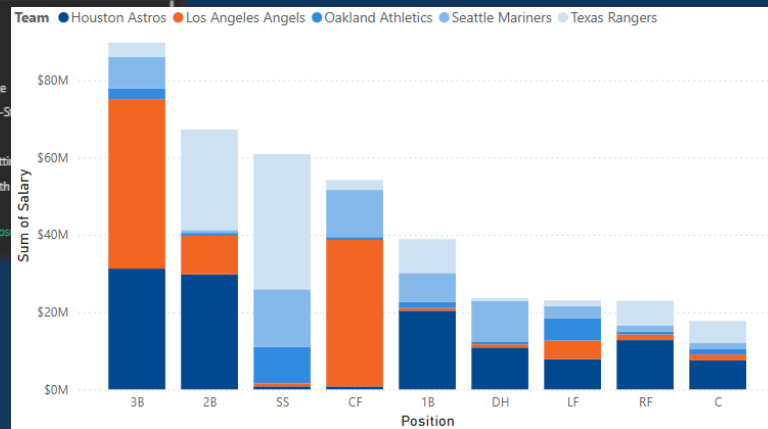
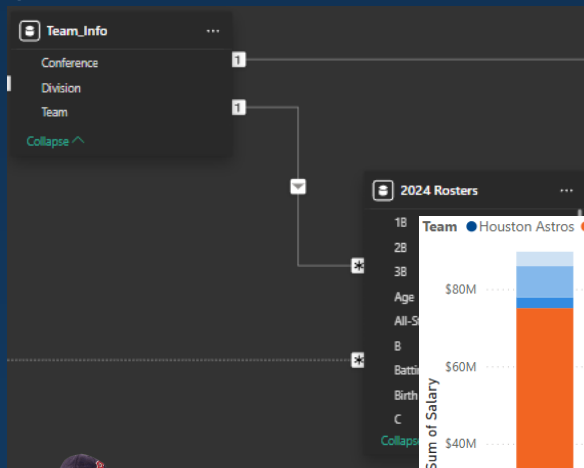
- **Overview of Analysis:** Determined multiple use cases relevant to the Program Office
  - Cost Estimation/Cost Analysis
  - Contract Tracking
- **Approach:** Instead of using PMO data, we illustrated Power BI's capabilities by analyzing MLB data
- **Why MLB Data?:** This allowed us to research an engaging dataset while drawing meaningful connections to PMO applications
- **Making Connections:** We established meaningful visualizations using MLB data and drew back to PMO elements
  - National League and American League (Conferences) → Investment and Sustainment (Life Cycle Phases)
  - MLB teams → Program contracts
  - Note: Connections between MLB and PMO elements will differ between use cases
- **Program Considerations:** Analysis will primarily relate to SW/IT programs, as that is our current focus
- **Ground Rules & Assumptions to Consider:**
  - MLB Data accurate as of December 2024
  - Data inaccuracies for players who played for multiple teams in 2024



# Exploring Power BI Through MLB Player Analysis

- **1,600+** raw data points (players)
- Collected salaries, contract start/end dates, games played per year, 2024 hitter projections & actuals (hits, HRs, RBIs, Etc.), & WAR (Wins Above Replacement)

Team	Name	Age	Birth	B	T	Ht	Wt	DoB	Yrs	G	GS	Batting	Defense	Position
Atlanta Braves	Jackson Stephens	30	us US	R	R	6' 2"	220	5/11/1994	5	3	0	0	3	P
Atlanta Braves	Jimmy Herget	30	us US	R	R	6' 3"	170	9/9/1993	6	8	0	0	8	P
Atlanta Braves	Luke Jackson	32	us US	R	R	6' 2"	210	8/24/1991	9	16	0	0	16	P
Atlanta Braves	Parker Dunshee	29	us US	R	R	6' 0"	215	2/12/1995	1st	1	0	0	1	P
Toronto Blue Jays	Brett de Geus	26	us US	R	R	6' 2"	190	11/4/1997	2	2	0	0	2	P
Toronto Blue Jays	Tommy Nance	33	us US	R	R	6' 6"	235	3/19/1991	3	20	0	0	20	P
Toronto Blue Jays	Wes Parsons	31	us US	R	R	6' 5"	206	9/6/1992	4	2	0	0	2	P
Toronto Blue Jays	Nick Robertson	25	us US	R	R	6' 6"	235	7/16/1998	2	1	0	0	1	P



- **Transformed data** with Power Query
  - Custom columns, data formatting
- Created over **20 relationships** between numerous data tables
- Built reports/data visualizations relevant to the **DoD Program Office**




# Use Case #1: Cost Estimation/Cost Analysis

- **#1 priority:** Developing cost estimates and analyzing program data
- Most applicable to using *actual costs* as methodology
  - Similar effort used as an analogy or continuous sustainment
- **Capabilities within Power BI allow for:**
  - *Data selection* for cost estimates, ie: selecting analogies, known vendors/OEM size, drill down from overall contract costs to lower level WBS elements
  - Analyzing *past contract* over certain period of performance
  - Tracking and analyzing contract *actuals/performance metrics*



"A one-stop shop for all things cost estimating!"

# Cost Estimation/Cost Analysis: MLB Analysis (Contract Analysis)



## Cost Estimation/Analysis - Contract Analysis

Team All

**Conference**

American League

National League

**Division**

AL Central

AL East

AL West

NL Central

NL East

NL West

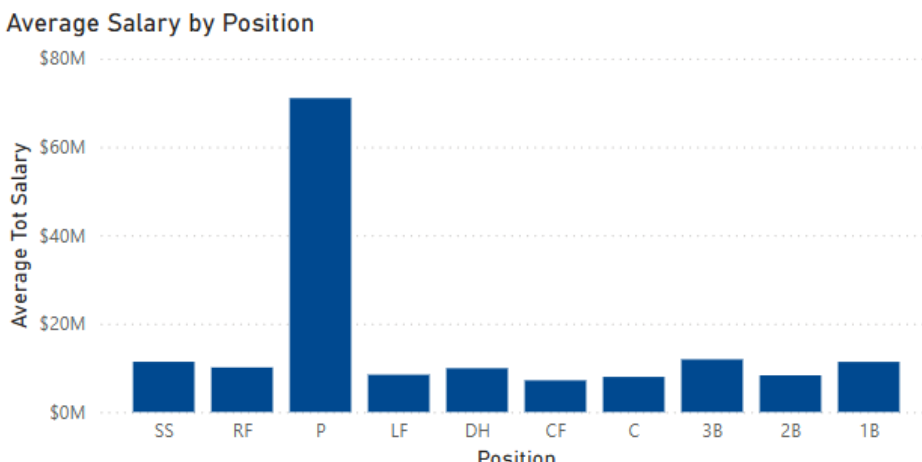
**Team**

Team	Tot Salary
<input type="checkbox"/> New York Yankees	\$286,208,084
<input type="checkbox"/> Texas Rangers	\$261,471,834
<input type="checkbox"/> New York Mets	\$258,608,750
<input type="checkbox"/> Los Angeles Dodgers	\$255,346,278
<input type="checkbox"/> Philadelphia Phillies	\$243,325,783
<input type="checkbox"/> Houston Astros	\$241,382,966
<input type="checkbox"/> Atlanta Braves	\$233,097,300
<input type="checkbox"/> Toronto Blue Jays	\$224,888,287
<input type="checkbox"/> Chicago Cubs	\$212,798,500
<input type="checkbox"/> St. Louis Cardinals	\$176,052,200
<input type="checkbox"/> San Francisco Giants	\$171,389,583
<input type="checkbox"/> Arizona Diamondbacks	\$159,430,452
<input type="checkbox"/> Los Angeles Angels	\$155,147,049
<input type="checkbox"/> San Diego Padres	\$151,658,555
<input type="checkbox"/> Boston Red Sox	\$139,351,275
<input type="checkbox"/> Colorado Rockies	\$136,829,963
<input type="checkbox"/> Minnesota Twins	\$124,518,041
<input type="checkbox"/> Chicago White Sox	\$123,163,625
<input type="checkbox"/> Milwaukee Brewers	\$111,392,460
<input type="checkbox"/> Kansas City Royals	\$107,977,261
<input type="checkbox"/> Seattle Mariners	\$106,806,948
<b>Total</b>	<b>\$4,692,682,123</b>

30

Teams

**Average Salary by Position**



Position	Average Tot Salary
P	\$71,010,121
3B	\$11,904,460
SS	\$11,357,760
1B	\$11,337,014
RF	\$10,075,005
DH	\$9,892,258
LF	\$8,438,583
2B	\$8,302,949
C	\$7,938,153
CF	\$7,155,659

\$156M


Avg Tot Salary

**- Initial analysis of MLB dataset:**

- **MLB teams and their total payroll in 2024**
- **Average total payroll by position based on teams selected**



# Cost Estimation/Cost Analysis: MLB Analysis (Contract Analysis)



## Cost Estimation/Analysis - Contract Analysis

Contracts

All

Life Cycle Phase (Investment or Sustainment)

National League

Sub-Effort

NL Central

NL East

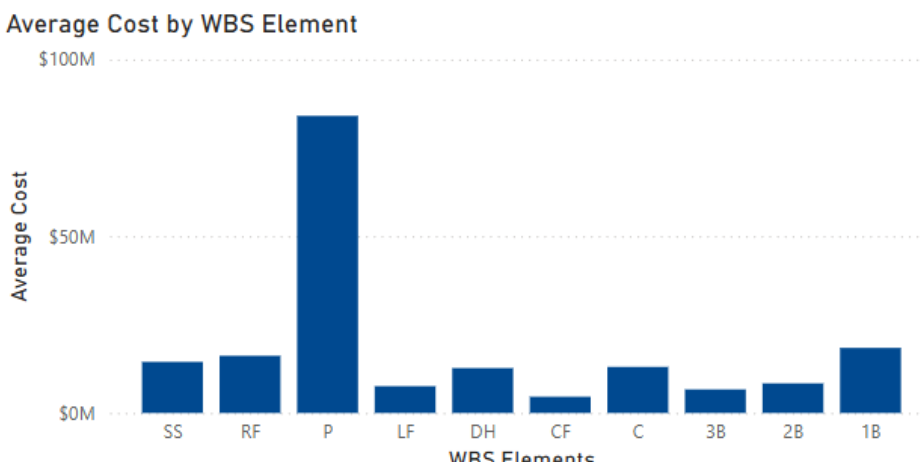
NL West

Contract	Actual Cost
⊞ New York Mets	\$258,608,750
⊞ Philadelphia Phillies	\$243,325,783
⊞ Atlanta Braves	\$233,097,300
⊞ P	\$109,520,000
⊞ 1B	\$22,000,000
⊞ 3B	\$21,747,300
⊞ DH	\$18,000,000
⊞ C	\$17,740,000
Sean Murphy	\$9,000,000
Travis d'Arnaud	\$8,000,000
Chadwick Tromp	\$740,000
⊞ RF	\$17,000,000
⊞ 2B	\$14,840,000
⊞ LF	\$5,250,000
⊞ CF	\$5,000,000
⊞ SS	\$2,000,000
⊞ Washington Nationals	\$94,857,467
⊞ Miami Marlins	\$87,819,600
<b>Total</b>	<b>\$917,708,900</b>

5

Contracts ↓

### Average Cost by WBS Element



WBS	Average Tot Cost
P	\$84,047,602
1B	\$18,407,092
RF	\$16,187,000
SS	\$14,461,625
C	\$13,046,480
DH	\$12,699,650
2B	\$8,378,760
LF	\$7,584,900
3B	\$6,664,500
CF	\$4,604,100

**\$184M**

Avg Tot Cost

- Conferences, Teams, and Salaries → Phases, Contracts, Costs
- Visualizing average costs by WBS element based on contracts selected
  - Fluid Analogy selection with updated results

Category of work:  
SW Development,  
HW Refresh, Etc.



# Cost Estimation/Cost Team Analysis: MLB Analysis (Historical Analysis)



## Cost Estimation/Analysis - Historical Cost Analysis

Contracts

Atlanta Braves

2019

2020

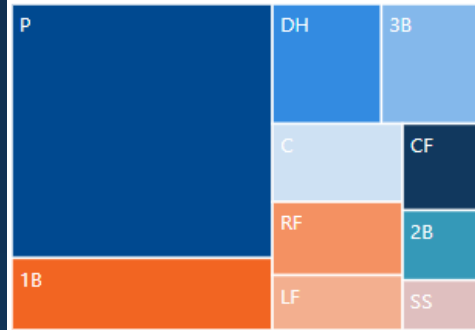
2021

2022

2023

2024

Avg Cost per Year by WBS Element



WBS	Avg Cost per Year
1B	\$20,743,333
2B	\$5,969,167
3B	\$13,039,460
C	\$11,223,333
CF	\$7,397,500
DH	\$14,400,000
LF	\$7,890,000
P	\$73,136,528
RF	\$10,541,667
SS	\$4,268,333
<b>Total</b>	<b>\$164,036,078</b>

WBS	2019	2020	2021	2022	2023	2024
1B	\$21,000,000	\$22,100,000	\$23,360,000	\$15,000,000	\$21,000,000	\$22,000,000
2B	\$575,000	\$3,700,000	\$3,000,000	\$6,700,000	\$7,000,000	\$14,840,000
3B	\$23,000,000		\$1,500,000	\$3,950,000	\$15,000,000	\$21,747,300
C	\$6,000,000	\$12,000,000	\$8,100,000	\$11,500,000	\$12,000,000	\$17,740,000
CF	\$6,260,000	\$8,700,000	\$8,700,000	\$9,975,000	\$5,750,000	\$5,000,000
DH		\$18,000,000	\$1,000,000	\$17,000,000	\$18,000,000	\$18,000,000
LF	\$4,270,000	\$3,250,000	\$12,570,000	\$10,000,000	\$12,000,000	\$5,250,000
P	\$64,196,667	\$55,505,000	\$54,800,000	\$75,350,000	\$79,447,500	\$109,520,000
RF	\$5,250,000	\$4,000,000	\$5,000,000	\$15,000,000	\$17,000,000	\$17,000,000
SS	\$1,160,000	\$3,150,000	\$6,000,000	\$10,000,000	\$3,300,000	\$2,000,000
<b>Total</b>	<b>\$131,711,667</b>	<b>\$130,405,000</b>	<b>\$124,030,000</b>	<b>\$174,475,000</b>	<b>\$190,497,500</b>	<b>\$233,097,300</b>

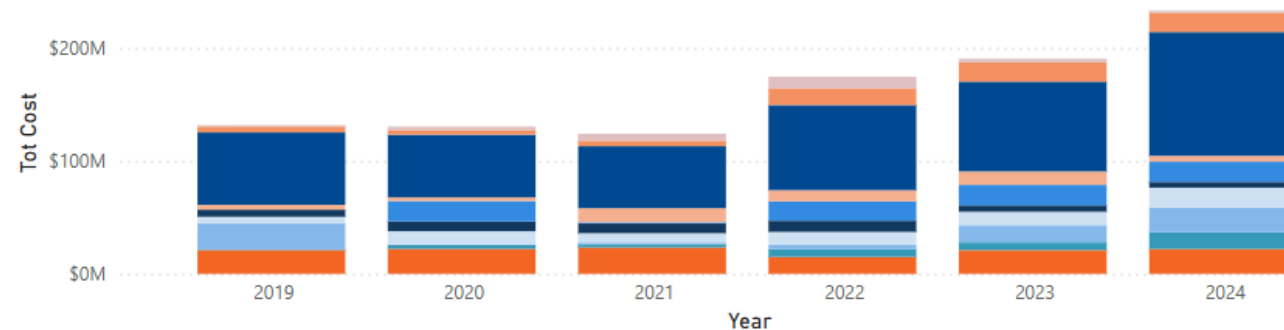
WBS Element

All


Year	Cost per Year	% Change
2019	\$131,711,667	
2020	\$130,405,000	-1%
2021	\$124,030,000	-5%
2022	\$174,475,000	41%
2023	\$190,497,500	9%
2024	\$233,097,300	22%
<b>Average</b>	<b>\$164,036,078</b>	

Tot Cost by Year and WBS Element

Position 1B 2B 3B C CF DH LF P RF SS



# Cost Estimation/Cost Team Analysis: MLB Analysis (Historical Analysis)



## Cost Estimation/Analysis - Historical Cost Analysis

Contracts ▼  
Atlanta Braves ▼

2019

2020

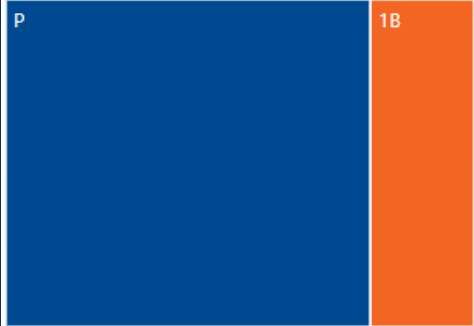
2021

2022

2023

2024

### Avg Cost per Year by WBS Element



WBS	Avg Cost per Year	WBS	2019	2020	2021	2022	2023	2024
1B	\$20,743,333	1B	\$21,000,000	\$22,100,000	\$23,360,000	\$15,000,000	\$21,000,000	\$22,000,000
P	\$73,136,528	P	\$64,196,667	\$55,505,000	\$54,800,000	\$75,350,000	\$79,447,500	\$109,520,000
<b>Total</b>	<b>\$93,879,861</b>	<b>Total</b>	<b>\$85,196,667</b>	<b>\$77,605,000</b>	<b>\$78,160,000</b>	<b>\$90,350,000</b>	<b>\$100,447,500</b>	<b>\$131,520,000</b>

- Filter by specific WBS elements to visualize relationships (I.e. PMP and SEPM)
- Visualizations support factor/CER implementation

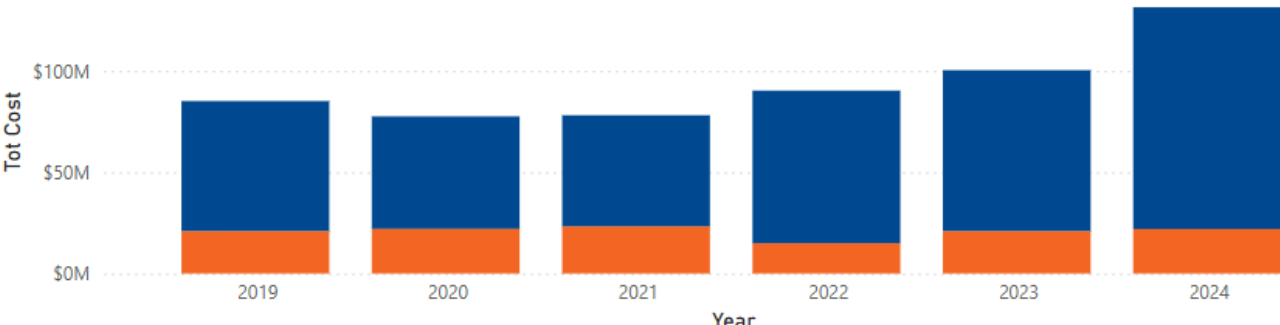
WBS Element

Multiple selections ▼

Year	Cost per Year	% Change
2019	\$85,196,667	
2020	\$77,605,000	-9%
2021	\$78,160,000	1%
2022	\$90,350,000	16%
2023	\$100,447,500	11%
2024	\$131,520,000	31%
<b>Average</b>	<b>\$93,879,861</b>	

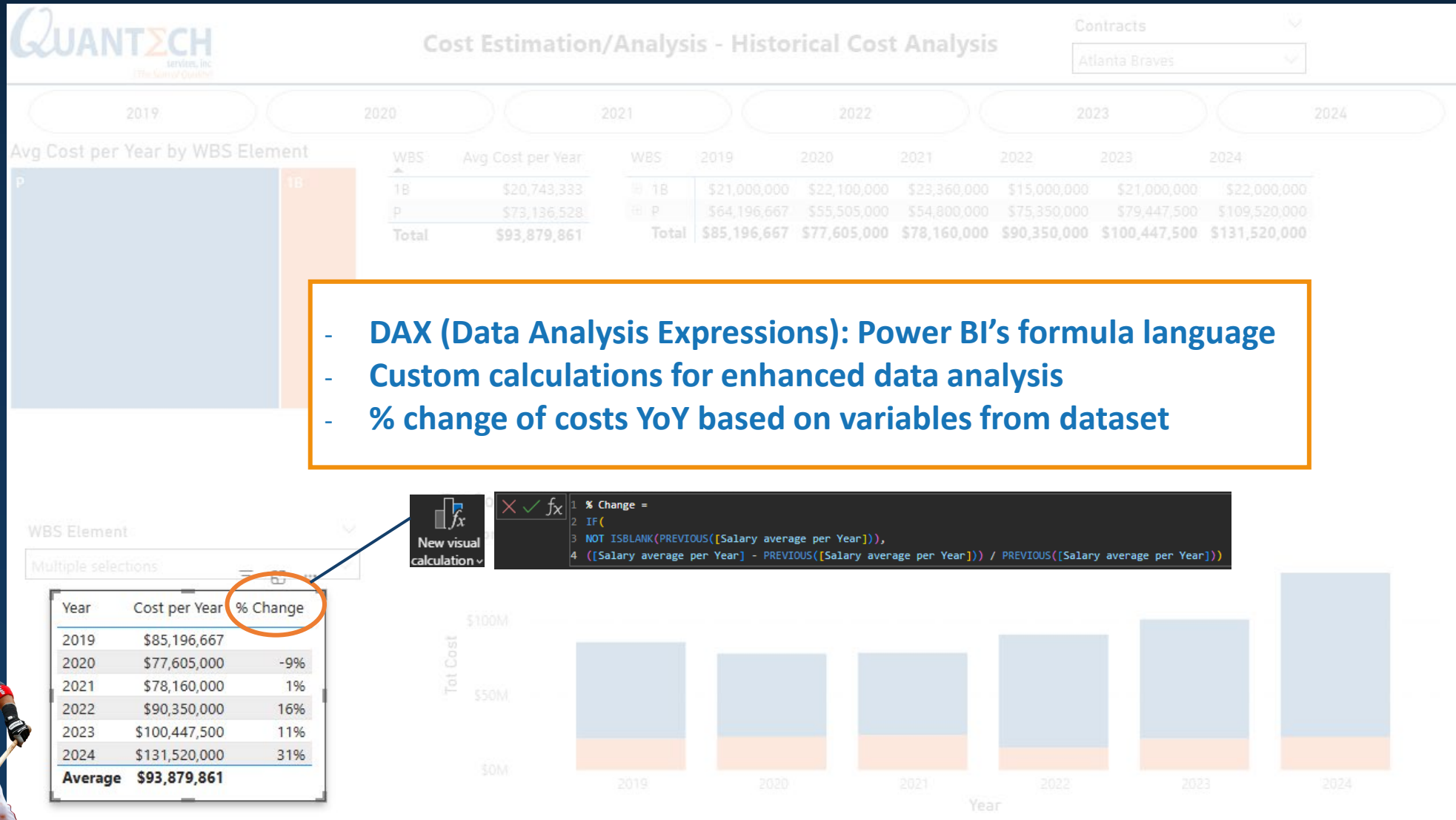
### Tot Cost by Year and WBS Element

Position ● 1B ● P





# Cost Estimation/Cost Team Analysis: MLB Analysis (Historical Analysis)



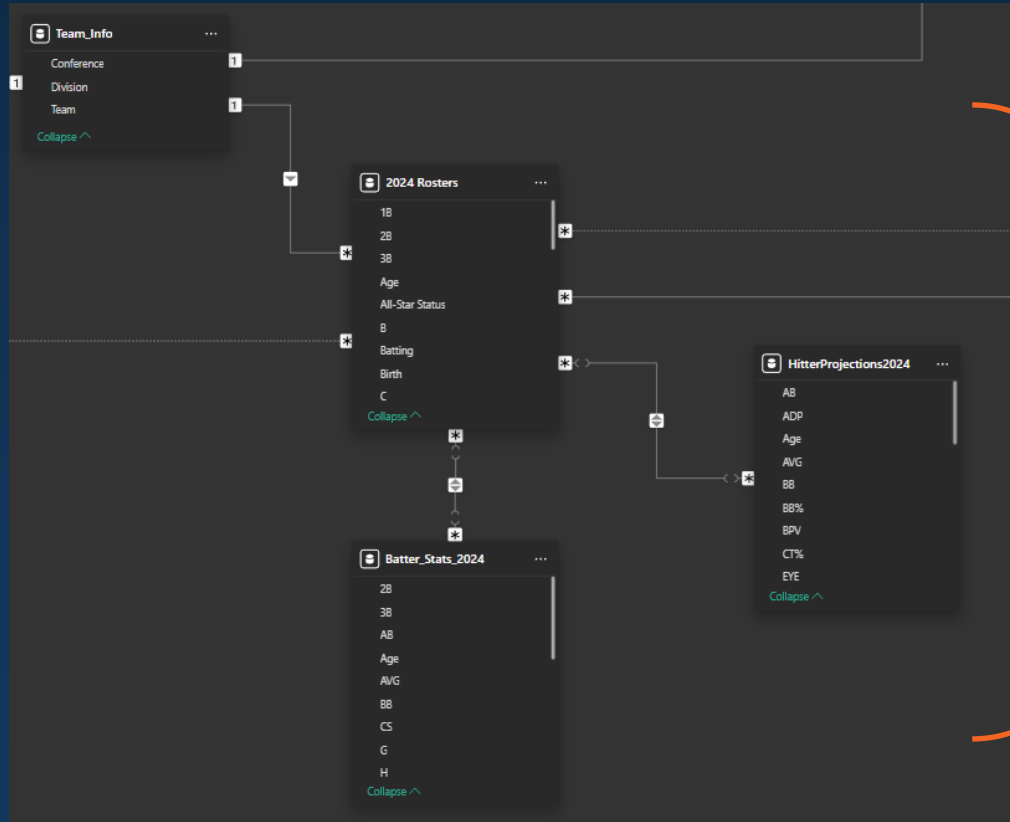
## Cost Estimation/Cost Analysis: MLB Analysis (Cost and Performance Metrics)

- HRs, RBIs, At Bats, & Strikeouts can transform into *performance metrics*
- Visualization showcases estimated Vs Actual HRs hit in the 2024 season by player

Team (Dev Team)	Player (PI)	Estimated HRs (Story Pts)	Actual HRs (Story Pts)	Actual Vs Estimated	% Dif
Atlanta Braves	Adam Duvall (PI 12)	16	11	-5	-31%
Atlanta Braves	Austin Riley (PI 13)	35	19	-16	-46%
Atlanta Braves	Jarred Kelenic (PI 14)	15	15	0	0%
Atlanta Braves	Marcell Ozuna (PI 15)	29	39	10	34%

- Through the lens of an *Agile software development* environment
  - Interpret each player as a *program increment* followed by the estimated and actual *story points* completed within that period
  - *Quantifiable* insights into team planning, efficiency, and overall performance

# Cost Estimation/Cost Analysis: MLB Analysis (Cost and Performance Metrics)



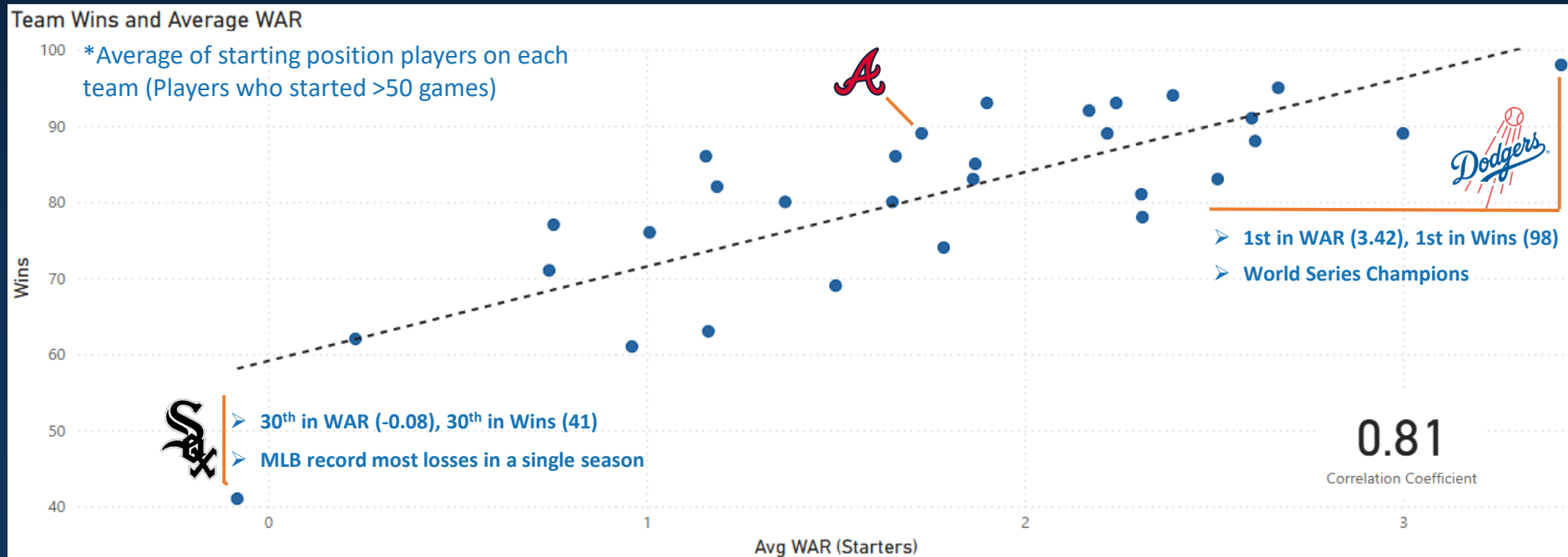
$$1 \text{ \% Dif HRs} = \frac{[\text{Actual Vs Estimated}]}{[\text{Estimated HRs}]}$$

$$2 \text{ HR minus HR} = \text{SUM}('Batter_Stats_2024'[HR]) - \text{SUM}('HitterProjections2024'[HR])$$

Team (Dev Team)	Player (PI)	Estimated HRs (Story Pts)	Actual HRs (Story Pts)	Actual Vs Estimated	% Dif
Atlanta Braves	Adam Duvall	16	11	-5	-31%
Atlanta Braves	Austin Riley	35	19	-16	-46%
Atlanta Braves	Jarred Kelenic	15	15	0	0%
Atlanta Braves	Marcell Ozuna	29	39	10	34%

- 4 datasets connected to created chart shown above
- Table relationships within model allow for endless connectivity
- Measures allow for analysis based on collected data

# Cost Estimation/Cost Analysis: MLB Analysis (Cost and Performance Metrics)



## Wins Above Replacement (WAR)

- A statistic that measures how many more wins a player contributes than a replacement player
- Metric that utilizes batting, baserunning, and fielding to determine player's value to team

## • Creating a *performance metric* using WAR

- Wins Above Replacement (WAR) → Measures a *player's total contribution* to their team (higher the WAR, higher the value of a player)
- As the average WAR (or individual player performance) per team increases, so does their win count
  - Correlation coefficient of 0.81

# Cost Estimation/Cost Analysis: MLB Analysis (Cost and Performance Metrics)

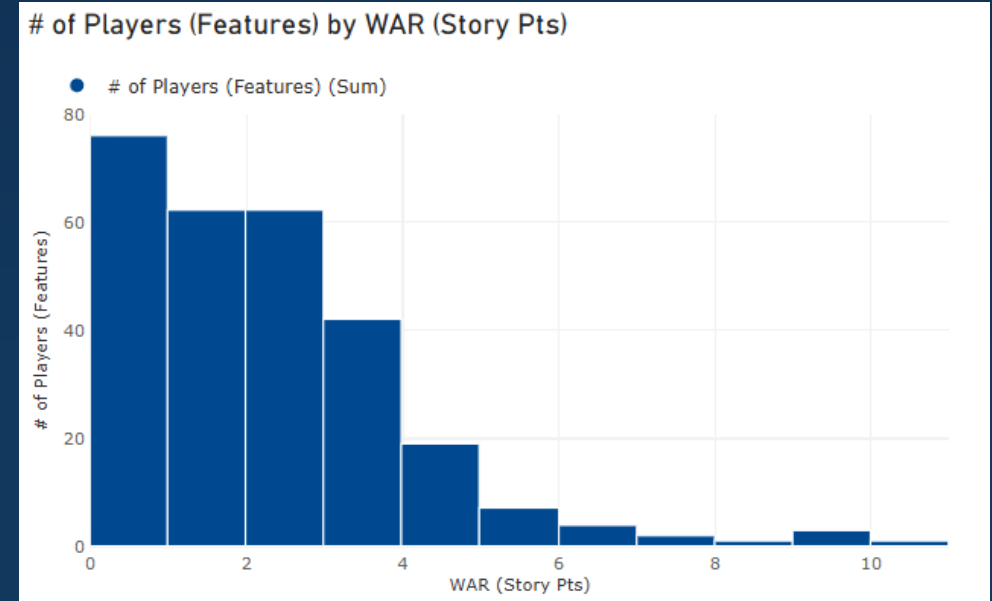
$$\text{\$ / WAR} = \text{DIVIDE}([\text{Salary}], [\text{WAR}])$$

Team (Dev Team)	Player (Feature)	Salary (Cost)	WAR (Story Pts)	\\$ / WAR (\\$ / Story Pts)
New York Yankees	Aaron Judge	\$40,000,000	10.80	\$3,703,704
Texas Rangers	Corey Seager	\$35,000,000	5.00	\$7,000,000
New York Mets	Francisco Lindor	\$34,100,000	6.90	\$4,942,029
New York Yankees	Juan Soto	\$31,000,000	7.90	\$3,924,051
Houston Astros	Alex Bregman	\$30,500,000	4.10	\$7,439,024
Los Angeles Dodgers	Mookie Betts	\$30,416,667	4.80	\$6,336,806
Los Angeles Dodgers	Shohei Ohtani	\$28,216,944	9.20	\$3,067,059
Philadelphia Phillies	Bryce Harper	\$27,538,461	4.80	\$5,737,179
Los Angeles Dodgers	Freddie Freeman	\$27,000,000	4.70	\$5,744,681

## • Creating a *cost metric* using WAR

- Higher the WAR, higher the value of a player)
- *Salary / WAR* → Way to evaluate cost efficiency; determines whether a team is getting good value for the cost of a player
- Interpreting WAR as Story Pts per feature, we can visualize *cost per Story Point*

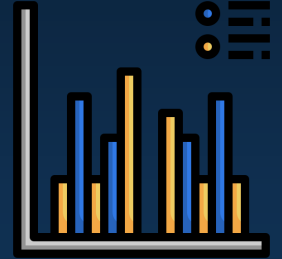
- Create insights through charts like a *histogram*
- Determine the typical *WAR* of a set of players *OR* the size distribution of past *features* worked on



\* WAR<sup>23</sup> value derived from Baseball Reference; rWAR calculation utilized

## Use Case #2: Contract Tracking

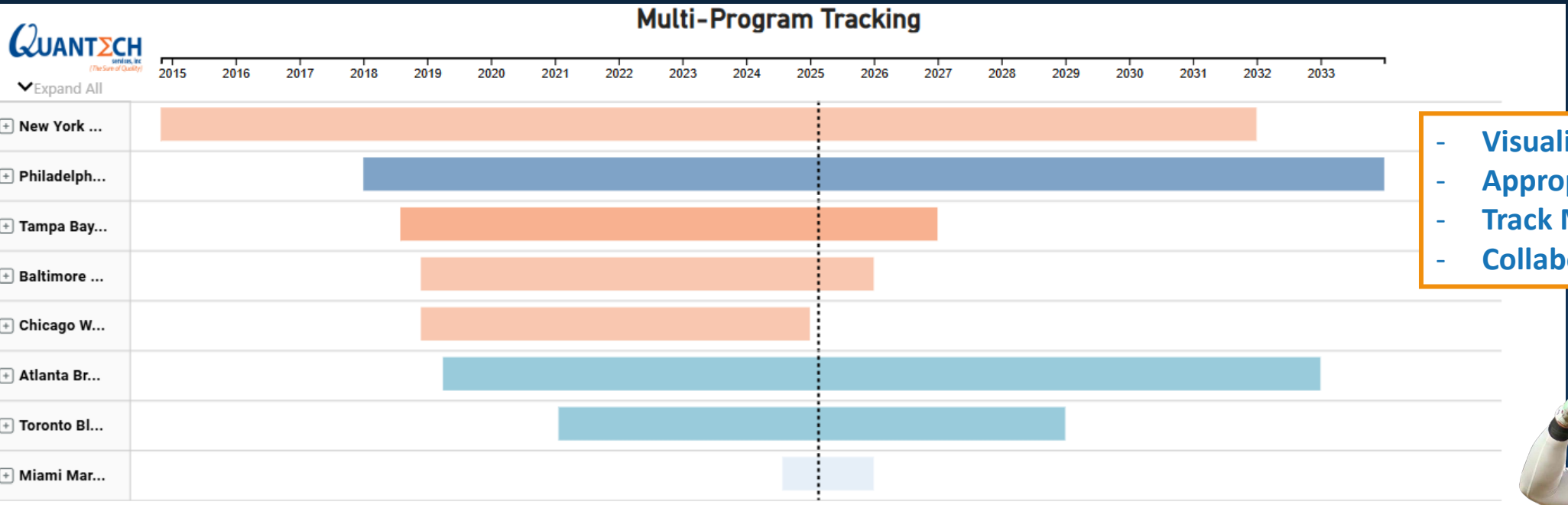
- Leveraging *schedule analysis* to ensure alignment with program timelines and milestones.
- With *contract tracking* we assure our ability to:
  - Tracking contract expiration and follow-on requirements
  - Assess support needs and align with program schedules
  - Utilize schedule analysis to confirm program timelines
  - Ensure availability of resources based on schedules
- **Power BI capabilities utilized:**
  - Data selection to improve *decision-making* by analyzing historical schedules, project analogies, and vendor information
  - *Drill down functions* for focused schedule impacts
- *Ongoing contract monitoring* with real-time accuracy



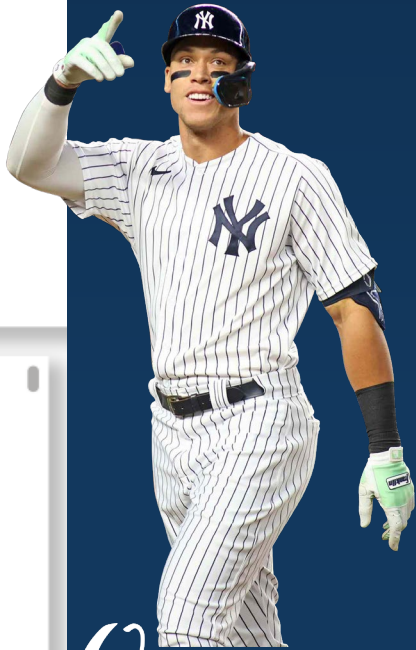
“I wonder if my option years will get picked up after 2026”



# Example #1: Multi-Program Tracking: MLB Analysis



- Visualize Program Timeline
- Appropriation Allocation
- Track Multiple Contracts
- Collaborative Tracking

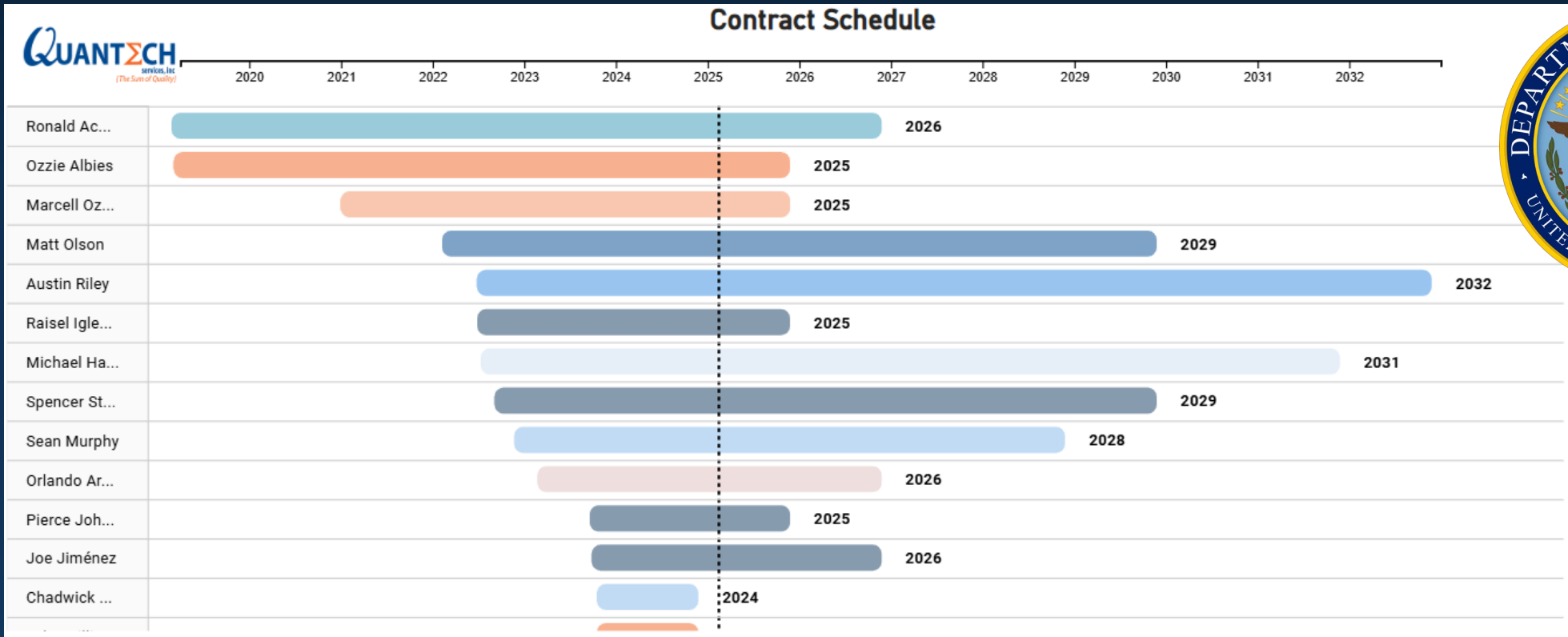


**Team** = Program  
**Player** = Contract  
**Position** =  
 Appropriation  
**End Date of Player** =  
 End date of contract

Appropriation				
1B	2B	3B	C	CF
DH	LF	P	RF	SS

Program	Contracts	Appropriation	PoP End Date
Atlanta Braves	Aaron Bummer	P	Tuesday, December 31, 2024
New York Yankees	Aaron Judge	CF	Wednesday, December 31, 2031
Philadelphia Phillies	Aaron Nola	P	Tuesday, December 31, 2030
New York Yankees	Anthony Rizzo	1B	Tuesday, December 31, 2024
New York Yankees	Anthony Volpe	SS	Wednesday, December 31, 2025
Atlanta Braves	Austin Riley	3B	Friday, December 31, 2032

# Example #2: Contract Tracking: MLB Analysis

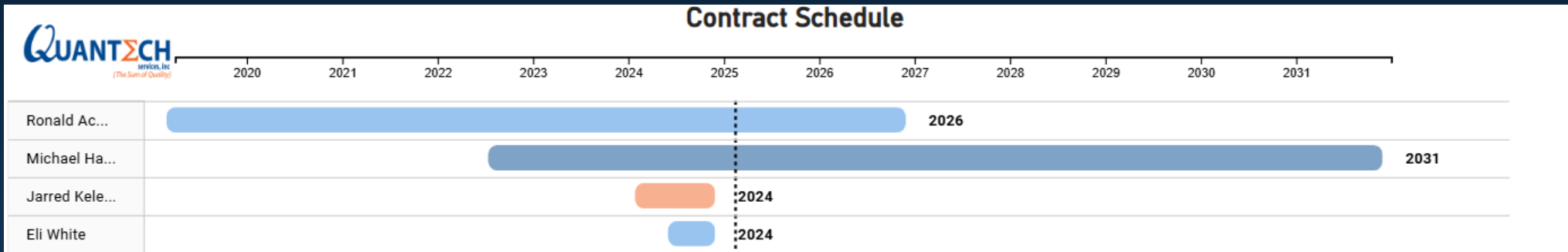


**Notice:**  
*Braves being the focus Program*  
**Player = Contract in Question**  
**Position = Appropriation**

Contracts	PoP End Date	Appropriation	Contract Status
Aaron Bummer	Tuesday, December 31, 2024	P	5 yrs/\$16M (20-24) & 25-26 team option
Austin Riley	Friday, December 31, 2032	3B	10 yrs/\$212M (23-32) & 33 team option
Bryce Elder	Tuesday, December 31, 2024	P	1 yr/\$740k (24)
Chadwick Tromp	Tuesday, December 31, 2024	C	1 yr/\$740k (24)
Chris Sale	Wednesday, December 31, 2025	P	2 yrs/\$38M (24-25) & 26 team option
David Fletcher	Wednesday, December 31, 2025	2B	5 yrs/\$26M (21-25) & 26-27 team option
Dylan Dodd	Tuesday, December 31, 2024	P	1 yr/\$740k (24)
Dylan Lee	Tuesday, December 31, 2024	P	1 yr/\$760k (24)
Eli White	Tuesday, December 31, 2024	RF	

Appropriation				
1B	2B	3B	C	CF
DH	LF	P	RF	SS

# Contract Tracking: MLB Analysis

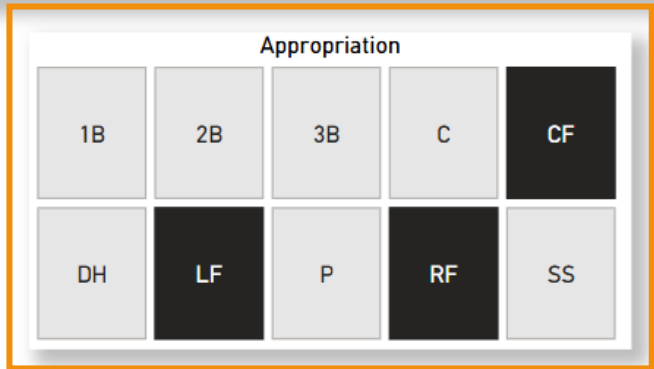


## Key Takeaways:

- **Drill down** functions can help us understand the need for specific follow-on contracts.
- This helps **decision-making** for the contracting office and leadership in a quick and effective manner.
- Being able to make that decision through specific drill downs can make it faster and more streamline within the organization.

“Like my contract, I’m up for renewal—let’s extend this for a few more seasons!”

Contracts	PoP End Date	Appropriation	Contract Status
Eli White	Tuesday, December 31, 2024	RF	
Jarred Kelenic	Tuesday, December 31, 2024	LF	1 yr/\$760k (24)
Michael Harris II	Wednesday, December 31, 2031	CF	8 yrs/\$72M (23-30) & 31-32 team option
Ronald Acuña Jr.	Thursday, December 31, 2026	RF	8 yrs/\$100M (19-26) & 27-28 team option



# *Wins and Woes of Power BI*

## **Wins**

- **Input variable selection, data collection, and visualization**
- **Decision analysis**
- **Scalability**
- **User friendly interface; Integration with Microsoft ecosystem**

## **Woes**

- **File location issues**
- **Error mitigation in Power Query and DAX**
- **Nothing is going to fix poor data collection**

# QUESTIONS?

# References

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