

# *Analytics Like a Pro:*

*The Differences between My Fantasy  
Team and Production Analytics in Sports*

Wednesday, April 11, 2018



## About the Presenter

Tim Trussell joined Kinduct in November of 2016 to head up its growing data sciences practice. Tim brings over 10 years of industry experience working with companies on the application of technology, statistical and machine learning techniques and data analysis in addressing unique and pressing business problems. Prior to joining Kinduct, Tim was the Manager of Data Sciences at SAS Canada. Tim is passionate about using the right data to help support the best decisions. His favourite example is when he automated a recommendation engine to help him set his fantasy hockey roster each week. Tim is excited to play a part in advancing the use of data for improved human performance.

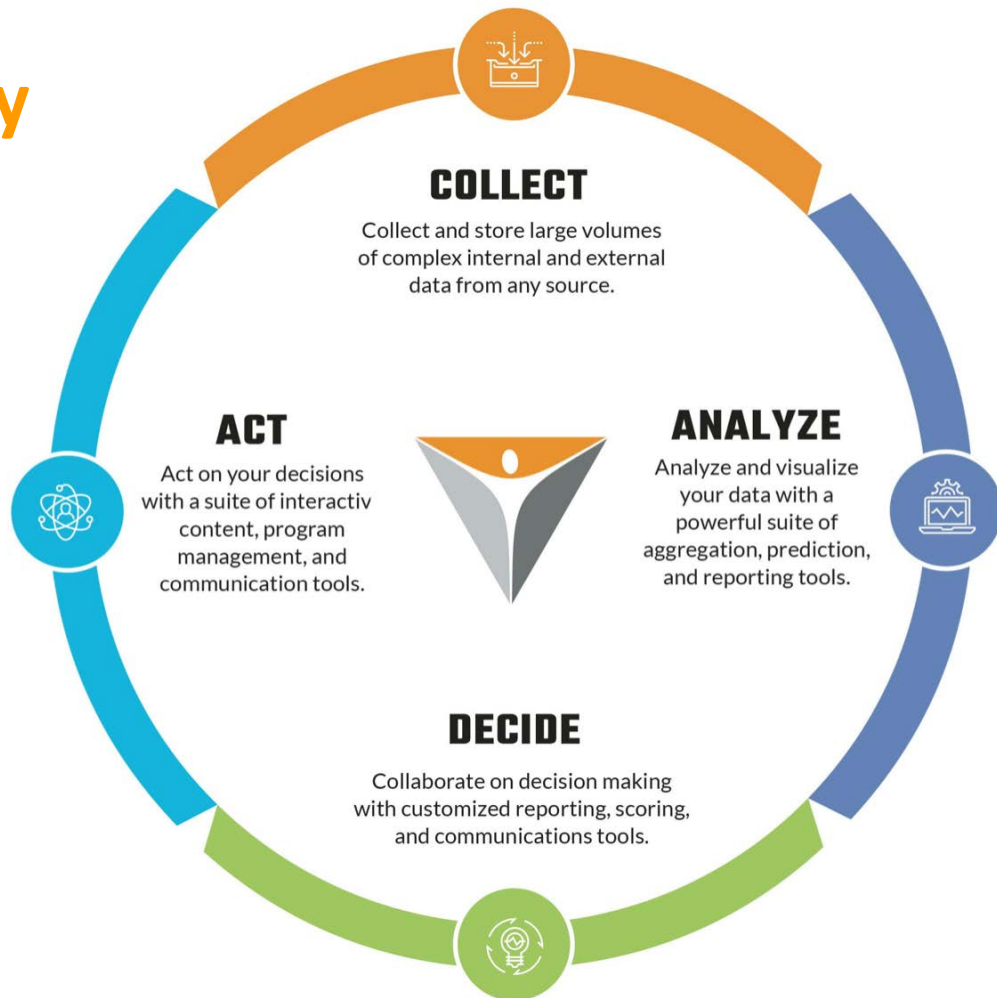
# Presentation Contents

- Kinduct Overview
- Operationalizing data science principles
  - A Piece of the Puzzle
  - Fundamentals of a Data Science Practice
  - Iterate to layer on value and learnings
- Case Studies

# Promise Delivery

**YOU** being a coach,  
sport scientist, athlete,  
etc.

**BETTER** at your  
job, results, training  
programs, game  
performance, injury  
recovery, etc.



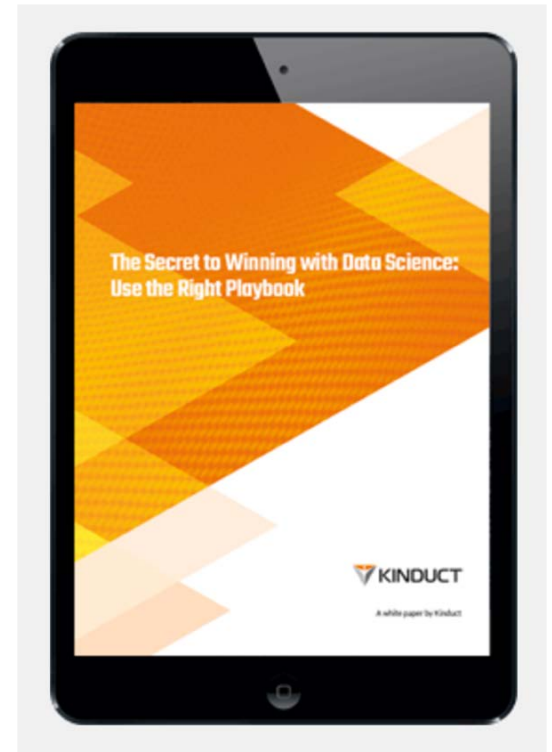


# Data Science

## A Piece Of The Puzzle

Data Science is part of the decision making process, not the entire decision.

- Magic Bullet. Over engineering leads to skeptics.
- Help inform in the process.
- Sport is a Complex System (Injury prediction/Performance).
- Empower the coach to make the decision



# Fundamentals of a Data Science Practice

**Technology, Architecture and Skills**

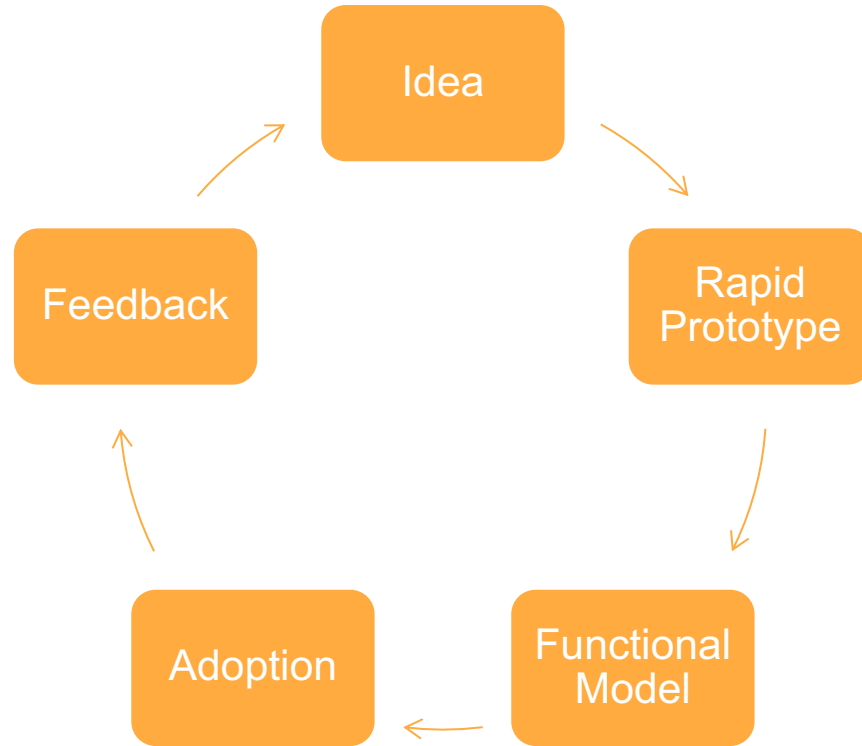
**Data Management and Governance**

**Data Driven Decision Support**

**Insight Generation**

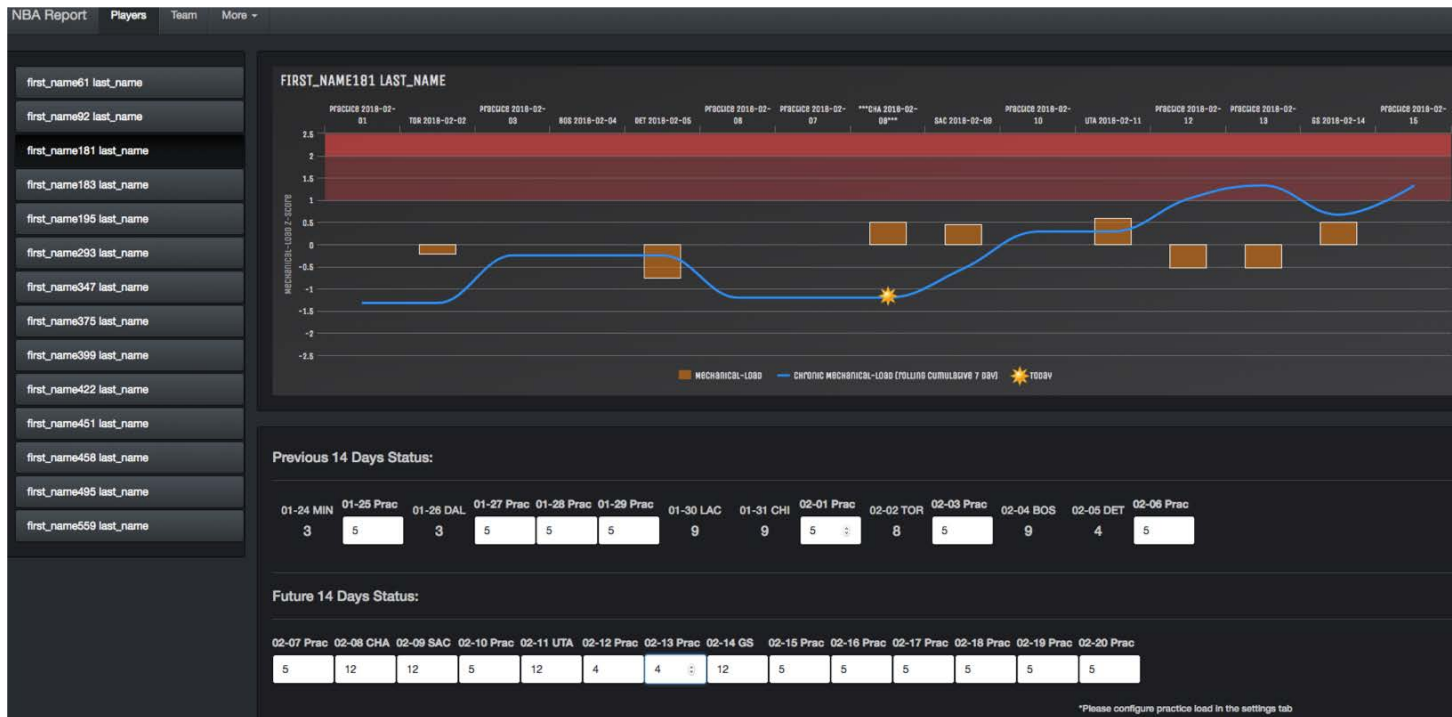
**Story Telling and  
Visualization**

# Iteration of value





# Case Study: Load Scenario Tool



Demo

## Context: NBA Player Movement Data

- Camera's capture each NBA players position and provide x,y,z coordinate on the court multiple times per second for every game.
- Teams want to leverage that data for competitive advantage

## ▶ A Piece of the Puzzle

- NBA teams have departments focused on ensuring players are able to meet the physical demands of a game.
- Increased injury risk has been linked to stress that the body is not conditioned for, so planning player loads is a daily task.
- Teams are motivated to give themselves the best opportunity to win every night so they can't rest everyone.

## Tapping into the Fundamentals: Technology, Architecture and Skills:

1. We needed technology and architecture to balance scalability, cost, and performance on big data.

- We needed to embrace AWS and Hadoop for storage and multi-thread processing.

2. Need to have a diverse team.

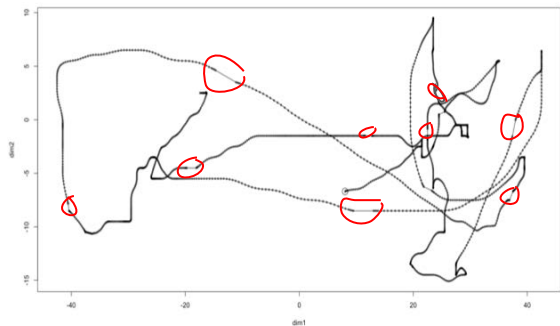
- The project team had a data engineer, data architect, application developer, and statistician

# Tapping into the Fundamentals: Data Management and Governance

## Challenge 1

### Data Quality

Develop and validate efficient methodologies for identifying and reconstructing low quality data.



## Challenge 2

### Metric Development

Develop and validate theoretical algorithms which capture meaningful physiological movement metrics

### Metrics

- Distance
- Duration
- Physiological Load
- Physiological Intensity
- Mechanical Load
- Mechanical Intensity
- Accelerations 1,2,3,4
- Decelerations 1,2,3,4

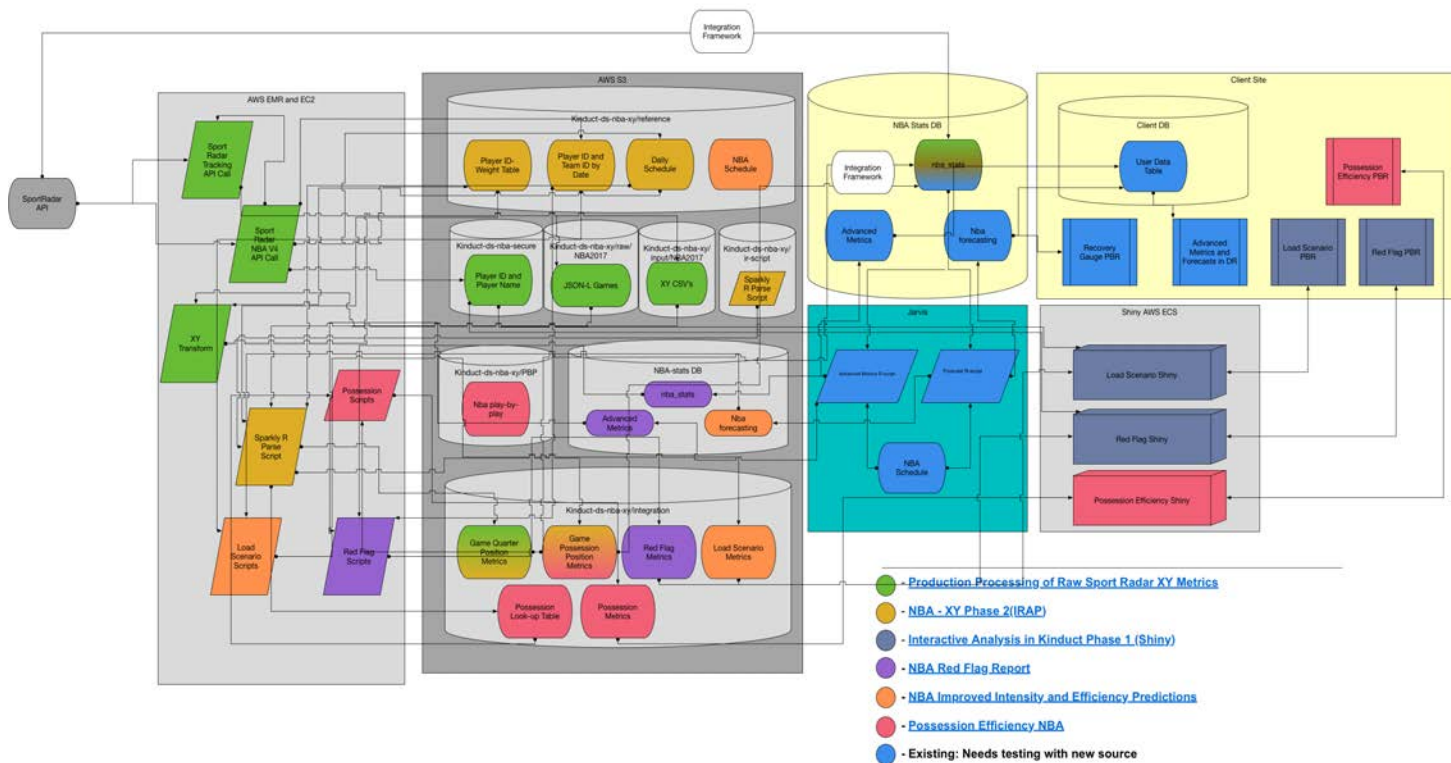
## Challenge 3

### Documentation

With many hand-offs between developer all building pieces in a tight timeline, strong project coordination was critical.

One example is we had inconsistent versions of the sample source file right up until 2 weeks prior to season tip off so had to have multiple system checks in place to find dependencies

# Tapping into the Fundamentals: Data Management and Governance



Project Logical Data Map

## Tapping into the Fundamentals: Data Driven Decision Support

We had to learn how to tell the story:

1. Get buy in for our measurement of load
2. Go beyond the predictive to the so what for adoption
  - We needed an interactive visual
  - The coach needed to have control

## Iteration Process for this use case

1. Derive Intensity and Load from movement data
2. Show the trend and player normal ranges
3. Predict when Intensity rate is likely to be high for a player
4. Allow for user input into the model
5. Introduce practice loads to reduce variability



# Other Examples of Team Success

## NBA Possession Efficiency

Game Date

Quarter 1:



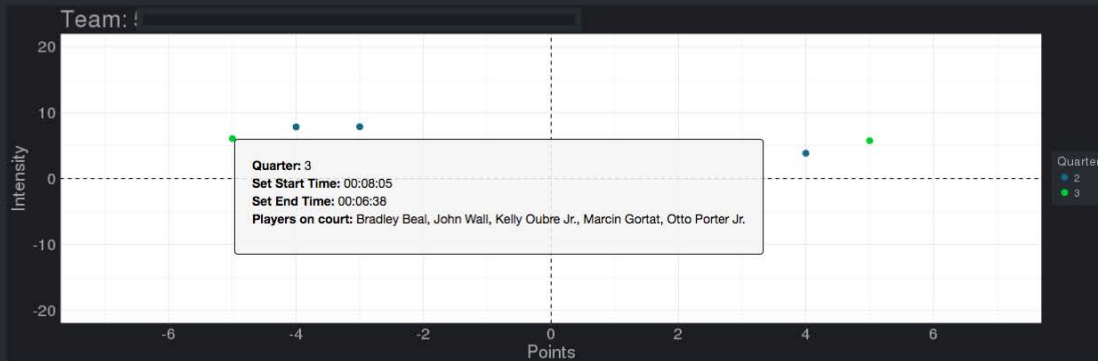
Quarter 2:



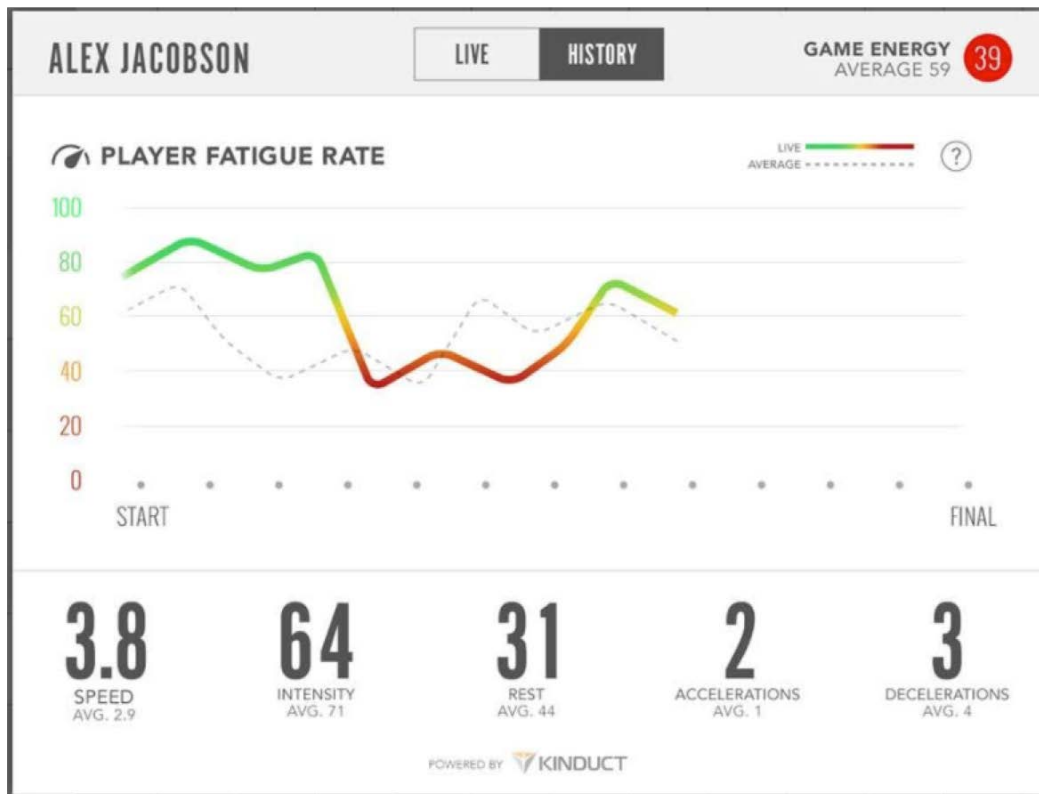
Quarter 3:



Quarter 4:



# Other Examples of Team Success



# Other Examples of Team Success

Show  entries Search:

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60	player_214	3327	2988.49	51.52	7	143	2	2	player_105	player_56	player_240
46	player_189	331	2198.51	50.41	164	166	3	3	player_234	player_266	player_363
16	player_125	2858	6551.91	49.84	14	10	4	2	player_206	player_146	player_371
136	player_356	990	3974.29	49.77	93	103	5	3	player_363	player_12	player_266
139	player_363	678	3991.48	49.72	127	102	6	3	player_356	player_12	player_266
77	player_240	4800	5023.76	49.04	2	75	7	2	player_221	player_105	player_206
11	player_12	577	4861.36	49.01	138	80	8	3	player_363	player_356	player_71
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92	player_266	681	2676.24	48.48	126	155	10	3	player_234	player_268	player_189

Showing 1 to 10 of 185 entries Previous      ...  Next

Show Advanced Analysis

# Questions



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