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Sports Analytics: Putting the Fun Back Into Analytics

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ENGINEERING AND OPERATIONS MANAGEMENT LUNCH & LEARN WEBINAR SERIES

November 11, 2020

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Please save all questions until the end of the presentation.

Please do not use the "Raise Hand" feature in this session.

We ask all questions will be typed in the Chat Box at the end of the presentation.

THANK YOU!

LET'S GET STARTED!

College of Engineering & Industrial Engineering Programs

- <u>Master of Science</u>
  - Operations Management
  - Engineering Management
  - Engineering
- <u>Graduate Certificates</u>
  - Project Management
  - Lean Six Sigma
  - Homeland Security

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TODAY'S PRESENTER

Walt DeGrange

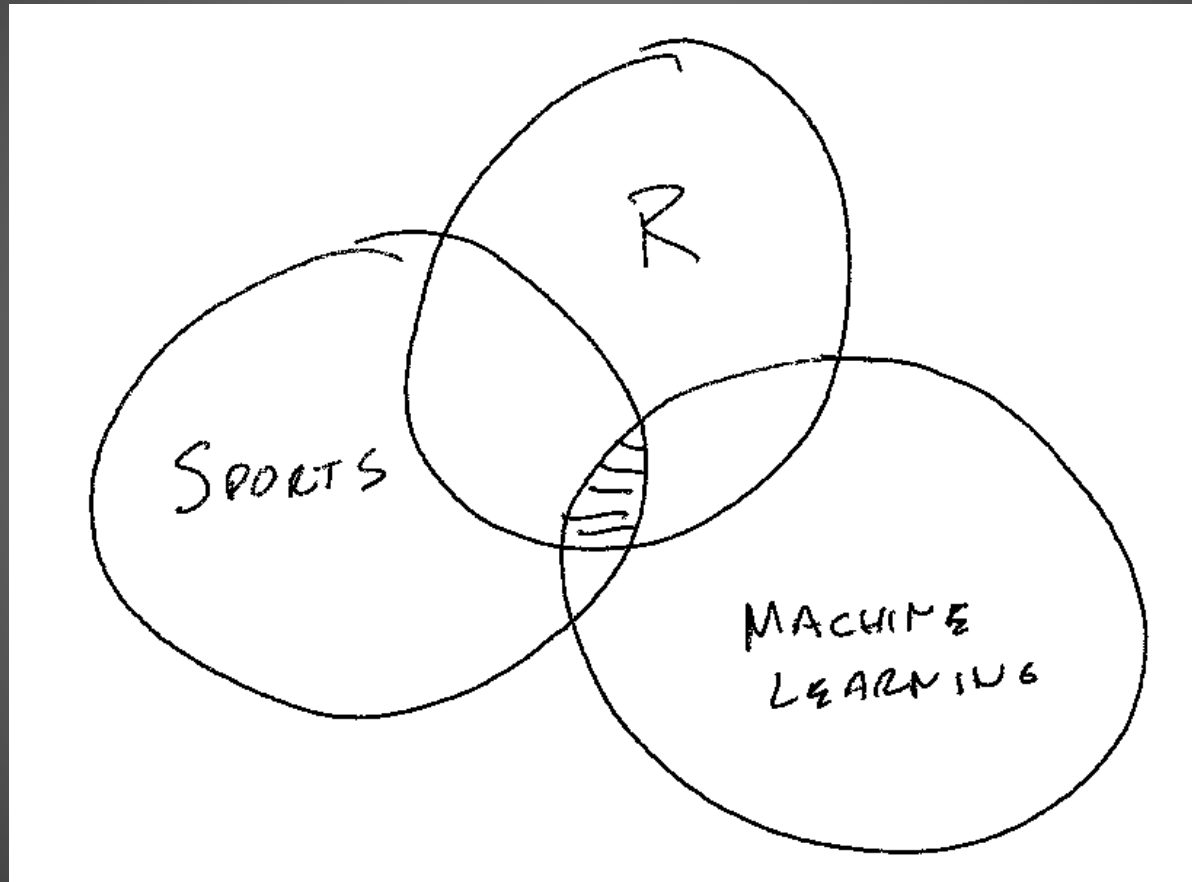*Sports Analytics: Putting the Fun Back Into Analytics*

Walt DeGrange is the Director for Analytics Capability for CANA Advisors where he helps organizations use analytics across federal and commercial domains. Prior to CANA Advisors, he had 21 years of Naval service as a Supply Corps Officer. The last 10 years in the Navy, his positions focused on supply chain analytics. He has taught courses in the MSOM program since 2014. Prior to that, he was an Assistant Military Professor at the Naval Postgraduate School in the Operations Research Department. Walt has also served on the Military Operations Research Society (MORS) Board of Directors and as the Chairperson for the INFORMS SpORts Section.
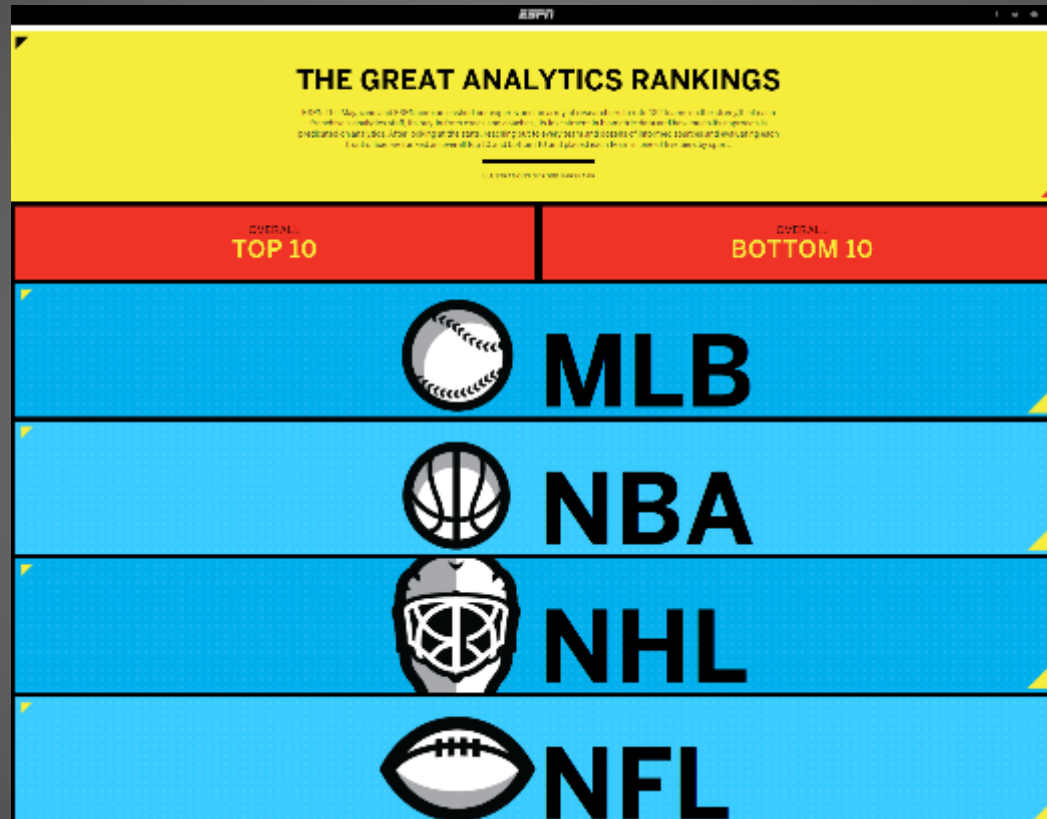
Charles Barkley (2015)

"Analytics don't work at all. It's just some crap that people who were really smart made up to try to get in the game because they had no talent. Because they had no talent to be able to play, so smart guys wanted to fit in, so they made up a term called analytics. Analytics don't work."

Why do this project?

ESPN The Great Analytics Rankings (2015)

http://www.espn.com/espn/feature/story/_/id/12331388/the-great-analytics-rankings

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ESPN The Great Analytics Rankings (2015)

http://www.espn.com/espn/feature/story/_/id/12331388/the-great-analytics-rankings

Data

- ESPN Analytics Ranking (1-5)
  - 5 – All-in
  - 4 – Believers
  - 3 – One foot in
  - 2 – Skeptics
  - 1 - Nonbelievers
- How far did the team go in the playoffs? (1-5)
  - 5 – Champion
  - 4 – Runner up
  - 3 – Loss in third round
  - 2 – Loss in second round
  - 1 – Loss in first round
- City size
  - 2010 US Census
  - Canadian Cities Wikipedia
- Salary – spotrac.com

Challenges

- Team analytics have changed. 2015 ESPN ranking only performed once.
- Salary data issues
  - Use available cap space for NHL, NFL, NBA
  - Use total team salary for MLB
- Expansion
  - Las Vegas Golden Knights
- Moving
  - 2016 Rams - St. Louis to Los Angeles
  - 2017 Chargers - San Diego to Los Angeles
  - 2020 Raiders - Oakland to Las Vegas
- Name Change
  - Washington Football Team
- 2020 US Census

Overview By Sport

Sport	count	MeanESPN	StdESPN
MLB	30	3.5	1.3
NBA	30	3.1	1.2
NFL	32	2.7	1.0
NHL	31	3.4	0.9

Local Teams

Sport	City	Team	ESPN	HowFar
MLB	Dallas	Rangers	3	1.7
NBA	Dallas	Mavericks	5	0.5
NFL	Dallas	Cowboys	4	1.0
NHL	Dallas	Stars	3	1.3
MLB	Kansas City	Royals	4	1.5
NFL	Kansas City	Chiefs	4	2.2
NBA	Memphis	Grizzlies	4	0.5

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Champions 2014

Sport	Team	City	ESPNRating	PopulationMil
MLB	Giants	San Francisco	3	0.9
NBA	GSWarriors	Oakland	4	0.4
NFL	Patriots	Boston	4	0.6
NHL	Blackhawks	Chicago	5	2.7

Champions 2015

Sport	Team	City	ESPNRating	PopulationMil
MLB	Royals	Kansas City	4	2.2
NBA	Cavaliers	Cleveland	4	0.4
NFL	Broncos	Denver	2	0.6
NHL	Penguins	Pittsburgh	4	0.3

Champions 2016

Sport	Team	City	ESPNRating	PopulationMil
MLB	Cubs	Chicago	5	2.7
NBA	GSWarriors	Oakland	4	0.4
NFL	Patriots	Boston	4	0.6
NHL	Penguins	Pittsburgh	4	0.3

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Champions 2017

Sport	Team	City	ESPNRating	PopulationMil
MLB	Astros	Houston	5	2.1
NBA	GSWarriors	Oakland	4	0.4
NFL	Eagles	Philadelphia	4	1.6
NHL	Capitals	Washington	4	6.1

Champions 2018

Sport	Team	City	ESPNRating	PopulationMil
MLB	RedSox	Boston	5	0.6
NBA	Raptors	Toronto	3	2.7
NFL	Patriots	Boston	4	0.6
NHL	Blues	St Louis	4	0.3

Champions 2019

Sport	Team	City	ESPNRating	PopulationMil
MLB	Nationals	Washington	4	6.1
NBA	Lakers	Los Angeles	1	3.8
NFL	Chiefs	Kansas City	4	2.2
NHL	Lightning	Tampa Bay	4	0.3

ESPN Rating

ESPNRating	Count	HowFar	MeanPop	MeanSalary
1	10	0.2	4.3	17.1
2	27	0.8	1.8	17.4
3	34	0.7	0.9	16.5
4	37	1.4	1.7	13.9
5	15	1.2	1.7	14.7

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ESPN Ranking Best Performance

Sport	Team	City	ESPNRating	PopulationMil	HowFar
NBA	GSWarriors	Oakland	4	0.4	3.8
NFL	Patriots	Boston	4	0.6	3.8
MLB	Dodgers	Los Angeles	4	3.8	2.8
NBA	Cavaliers	Cleveland	4	0.4	2.8
NHL	Golden Knights	Las Vegas	5	0.6	2.7
NHL	Lightning	Tampa Bay	4	0.3	2.7
NBA	Raptors	Toronto	3	2.7	2.5
NHL	Penguins	Pittsburgh	4	0.3	2.3
MLB	Astros	Houston	5	2.1	2.3
NFL	Chiefs	Kansas City	4	2.2	2.2

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ESPN Ranking Worst Performance

Sport	Team	City	ESPNRating	PopulationMil	HowFar
MLB	Pirates	Pittsburgh	5	0.3	0.3
MLB	Rays	Tampa Bay	5	0.3	0.3
NBA	Mavericks	Dallas	5	1.2	0.5
MLB	As	Oakland	5	0.4	0.5
NBA	76ers	Philadelphia	5	1.6	0.8
NBA	Spurs	San Antonio	5	1.5	1.3
MLB	Indians	Cleveland	5	0.4	1.3
NHL	Blackhawks	Chicago	5	2.7	1.3
MLB	Yankees	New York	5	8.6	1.5
MLB	RedSox	Boston	5	0.6	1.5

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Los Angeles Team Performance

Sport	Team	ESPN	HowFar
MLB	Angels	3	0.3
MLB	Dodgers	4	2.8
NBA	Clippers	2	1.2
NBA	Lakers	1	0.8
NFL	Chargers	1	0.3
NFL	Rams	2	0.8
NHL	Ducks	2	1.3
NHL	Kings	4	0.3

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New York Team Performance

Sport	Team	ESPN	HowFar
MLB	Mets	4	0.8
MLB	Yankees	5	1.5
NBA	Knicks	1	0.2
NBA	Nets	1	0.3
NFL	Giants	2	1.3
NFL	Jets	1	0.8
NHL	Islanders	4	1.3
NHL	Rangers	2	1.7

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Small City's Team Performance

Sport	Team	ESPN	HowFar	PopulationMil
NFL	Packers	3	1.8	0.1
NHL	Panthers	3	1.3	0.1

2019 K-Means Clustering Plot

CLUSPLOT(TeamData2019)

These two components explain 31.55 % of the point variability.
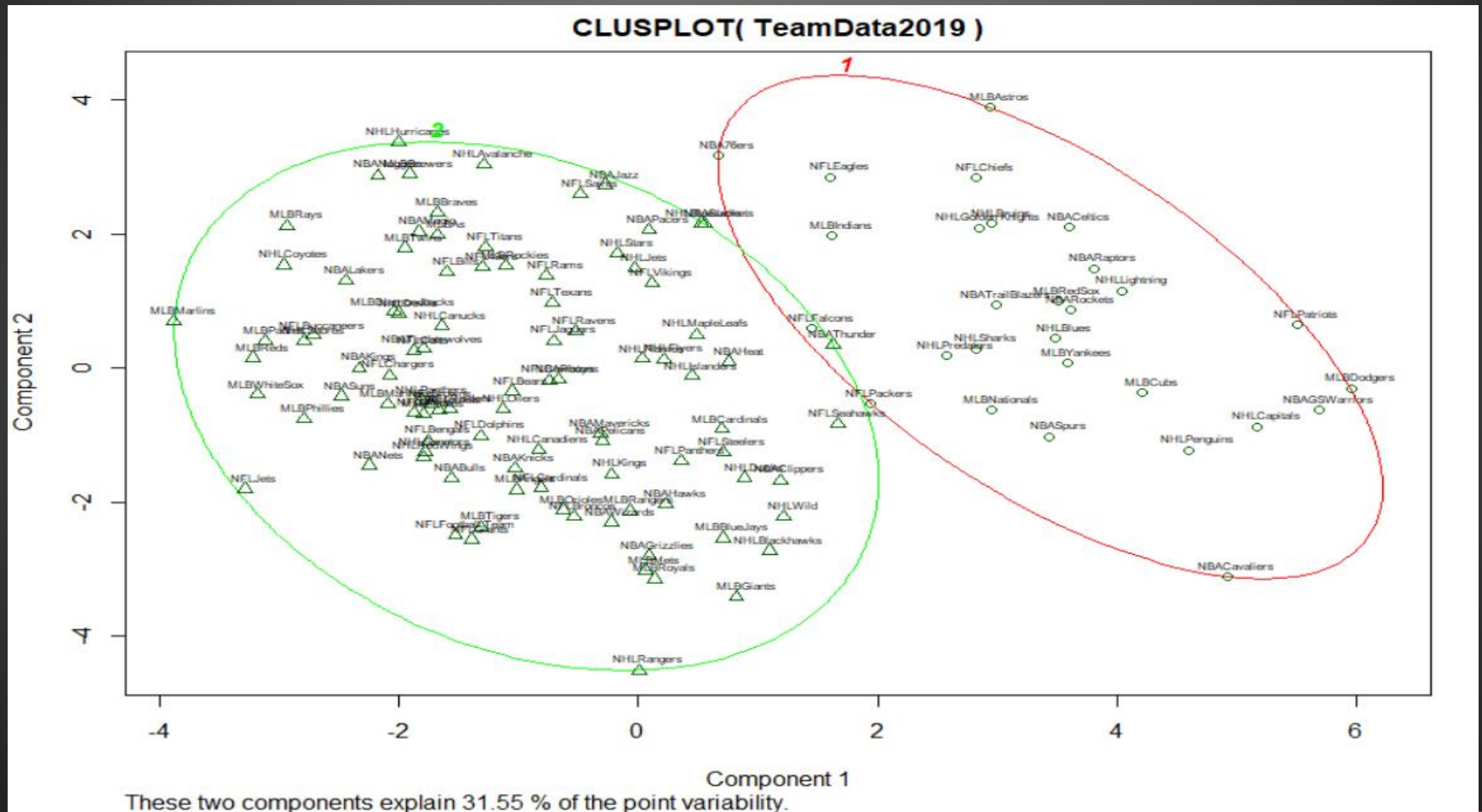
2019 K-Means Clustering Data

Cluster	Teams	MeanX2014HF	MeanX2015HF	MeanX2016HF	MeanX2017HF	MeanX2018HF	MeanX2019HF	MeanPopulation	MeanSalary	MeanESPNRating
1	30	1.5	1.9	2.4	2.5	2.1	1.5	1.6	12.7	4.0
2	93	0.7	0.6	0.4	0.4	0.6	0.7	1.7	16.9	2.9

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2015-2019 Gap Between High and Low ESPN Analytics Groups
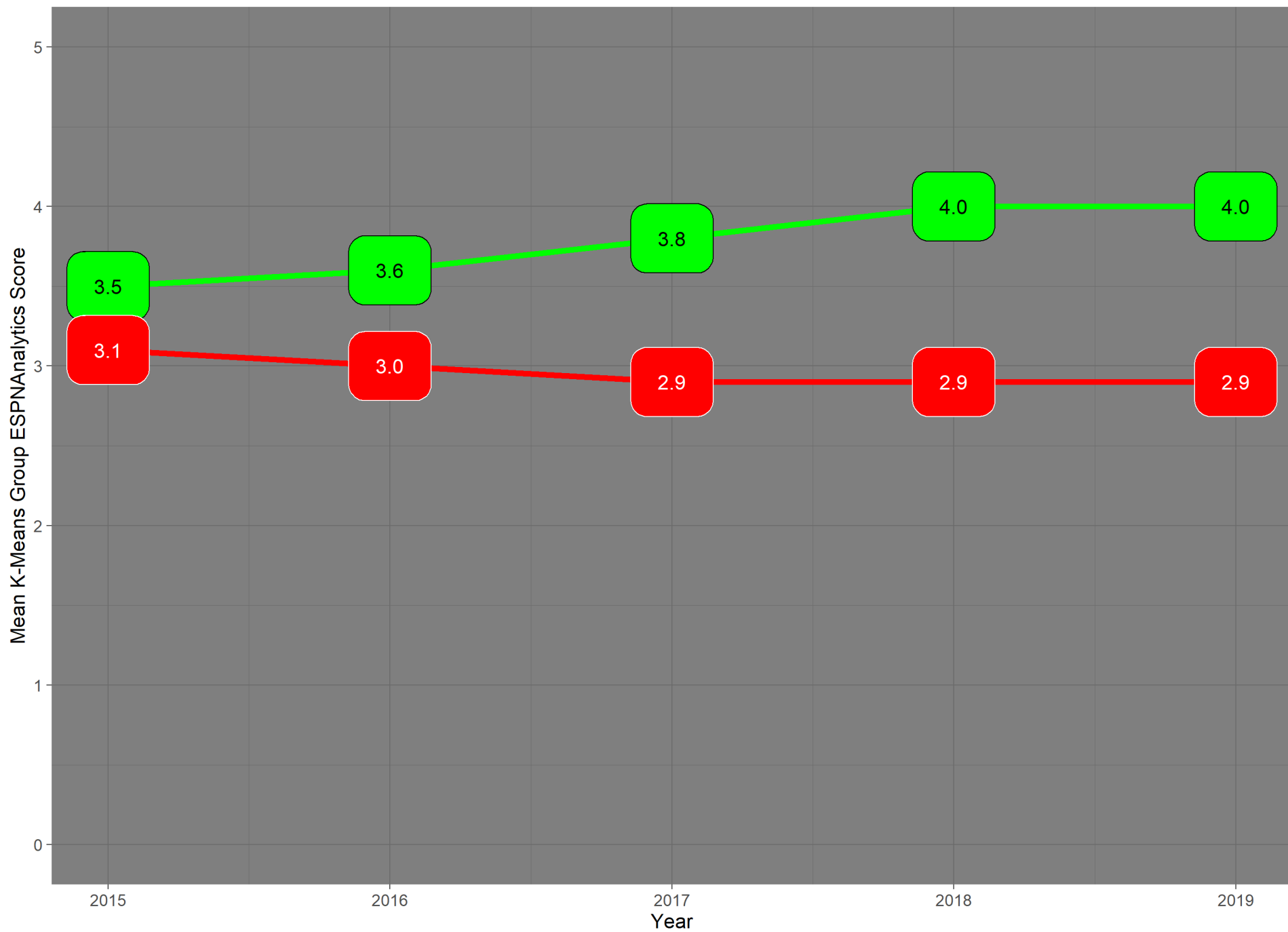
https://github.com/ltwalt/espnsports

Question and Answer with Walt

Type your questions in the chat section of this session.

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M.S. OPERATIONS MANAGEMENT

AT A GLANCE:

- 100% Online (or live)
- In-State Tuition for Everyone!
- 10 Graduate Course Program (30 hours)
  - Up to 4 prerequisite classes may be required
- Five 8-week Sessions Per Year
- Pair Master's with Graduate Certificate with no extra hours required
- No GRE/GMAT required with 3.0 Bachelor's GPA
- Total Program Cost is $12,000 to $15,000 (depending on prereqs needed)

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Graduate Certificates

<u>Project Management</u> – Designed to provide skills to become better project managers and prepare for PMP Certification

<u>Lean Six Sigma</u> – Learn how to eliminate problems, remove waste and reduce variation to improve operations

<u>Homeland Security</u> – Designed for industry and safety professionals to learn how to mitigate risk

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Graduate Certificates

- Only 4 Classes!
- Obtain as part of your Master's Degree without taking extra classes
- 2.5 Undergraduate GPA required for admission
- No GRE/GMAT
- Classes will double count!
- Can also be completed as stand-alone program
- Transition to MSOM option with no GRE

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Covid-19 Special Announcement:

Effective for Spring, Summer & Fall 2021 terms, at this time we are waiving the GRE for applicants with a 2.5-2.99 undergraduate GPA. Applicants with above a 3.0 GPA is automatically waived for any term.

Once GRE testing centers resume operations, the standard admissions requirements will go back into full effect.

Question and Answer with Walt

Type your questions in the chat section of this session.

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NEXT WEBINAR:

Agile Project Management & Innovative Technology Development

Presented by: Dr. Rocky Gay

THANKS FOR ATTENDING!

- For information about our flexible degree program options, email Karin Hickenbotham kahicken@uark.edu or visit operations-management.uark.edu

- *Registered* participants will receive an email with the video link to this webinar.

- We hope to see you online next month!

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