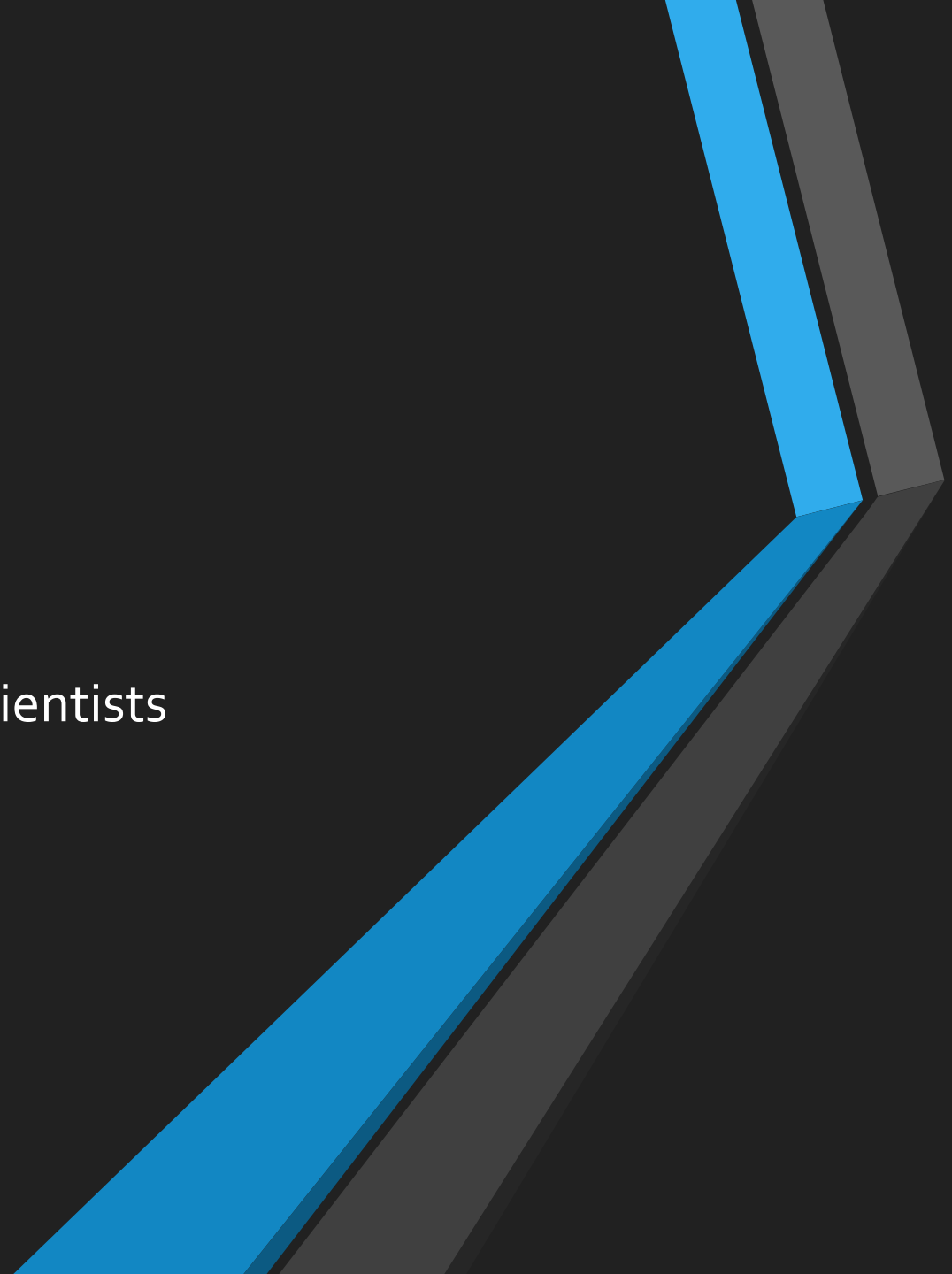


The application of Data Science in Business

Dr Rob Mastrodomenico

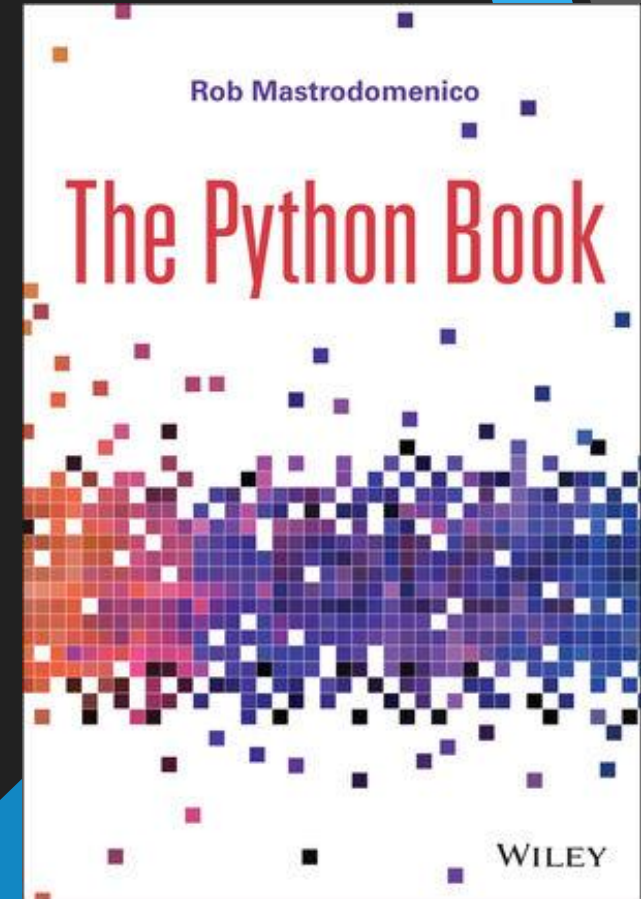


Overview

- About me
 - What is Data Science
 - How to use Data Science for non Data Scientists
 - Examples of Data Science
 - Lessons to take away
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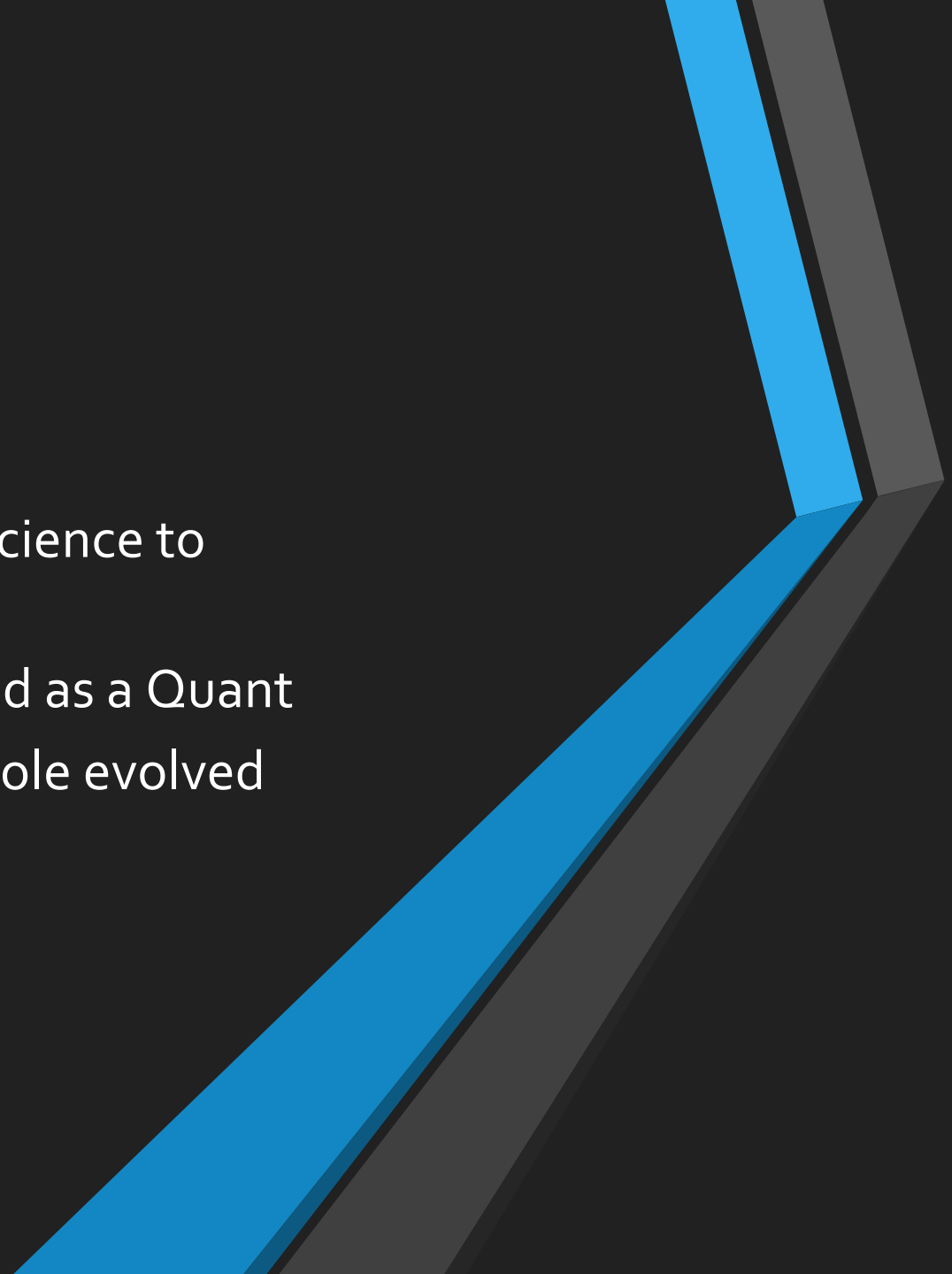
About me

- PhD in Applied Statistics
- Worked in a variety of Data Science roles
- CTO of various companies
- Published book on Python
- Upcoming book on Data Science applied to sports



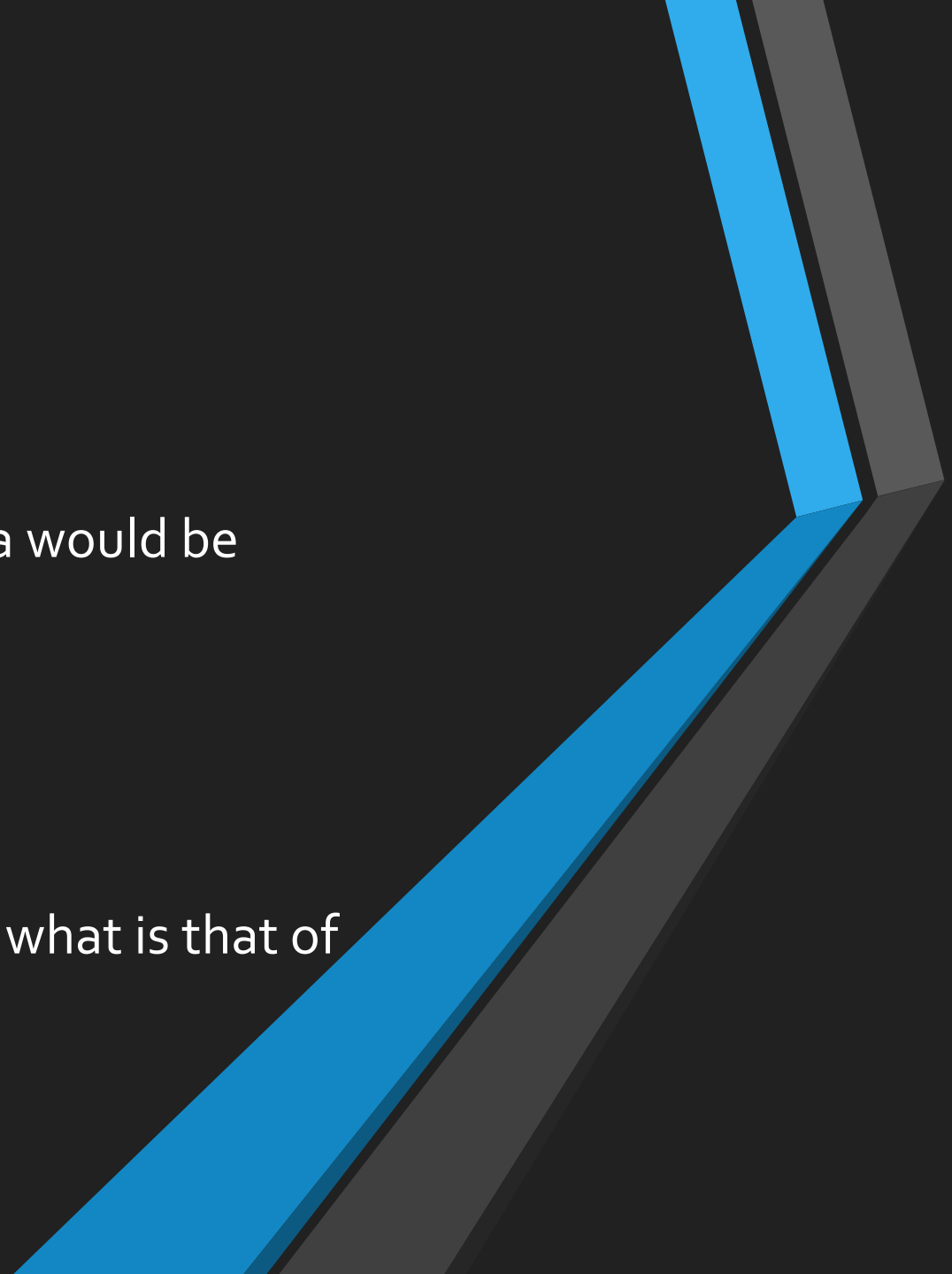


About me

- Spent majority of career applying Data Science to sporting problems
 - At the offset of career I would be defined as a Quant
 - However over time the definition of the role evolved into Data Scientist
- 

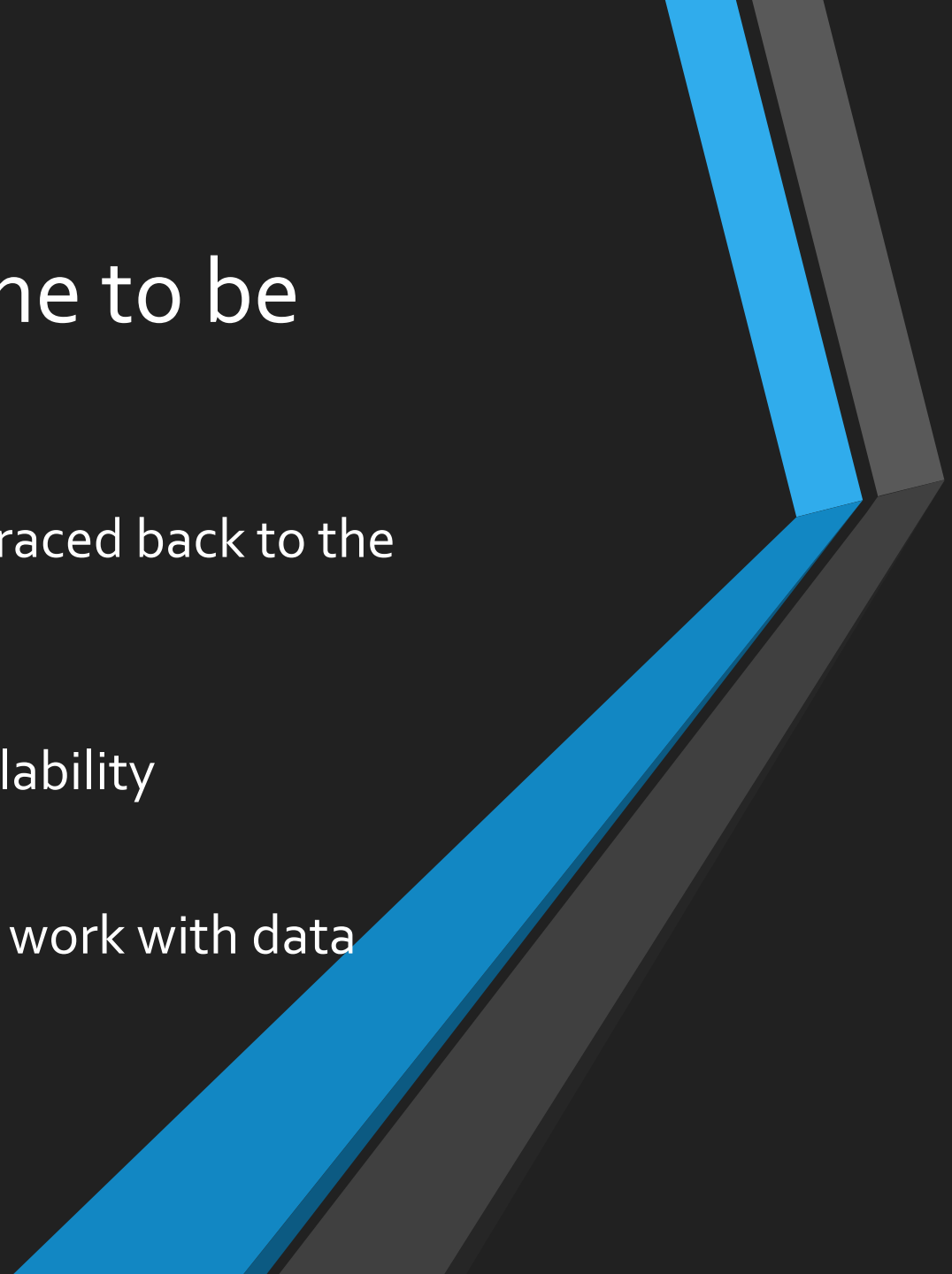


Evolution to Data Science

- Historically people who worked with data would be defined as
 - Statistician
 - Analyst
 - Quantitative Analyst
 - These traditional roles have evolved into what is that of a Data Scientist
- 




How did Data Science come to be

- The boom in Data Science can really be traced back to the following
 - Increased volumes of data
 - Increase in computer power and availability
 - Increase in ways to work with data
 - This has increased the skill set needed to work with data
- 

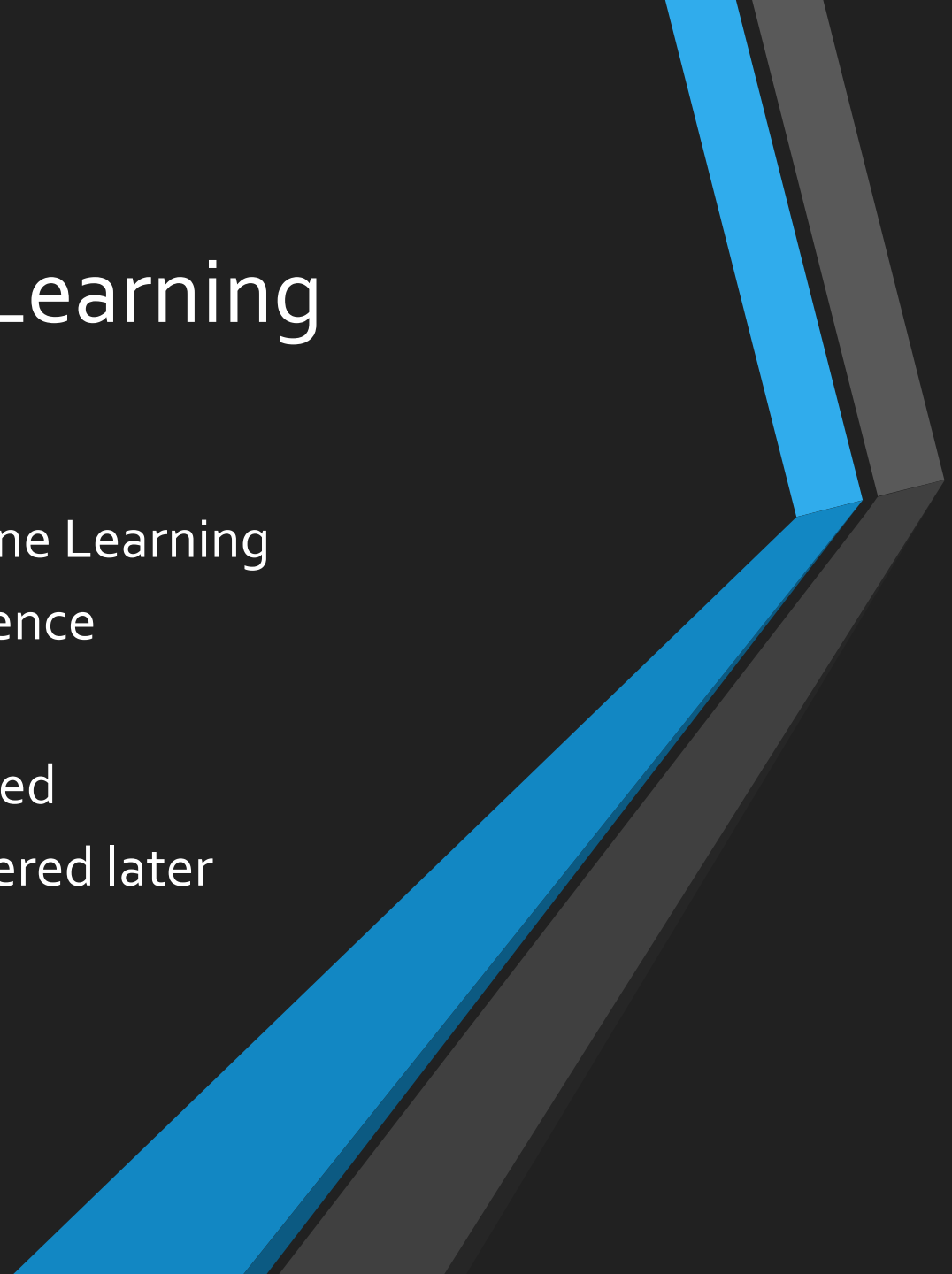


The makeup of a Data Scientist

- Quantitative skills (Maths, Statistics, Physics etc)
 - Programming Skills (Python, R etc)
 - Data skills (SQL)
 - Cloud skills (AWS, GCP, Azure)
 - A data scientist may or may not have all the skills listed
- 

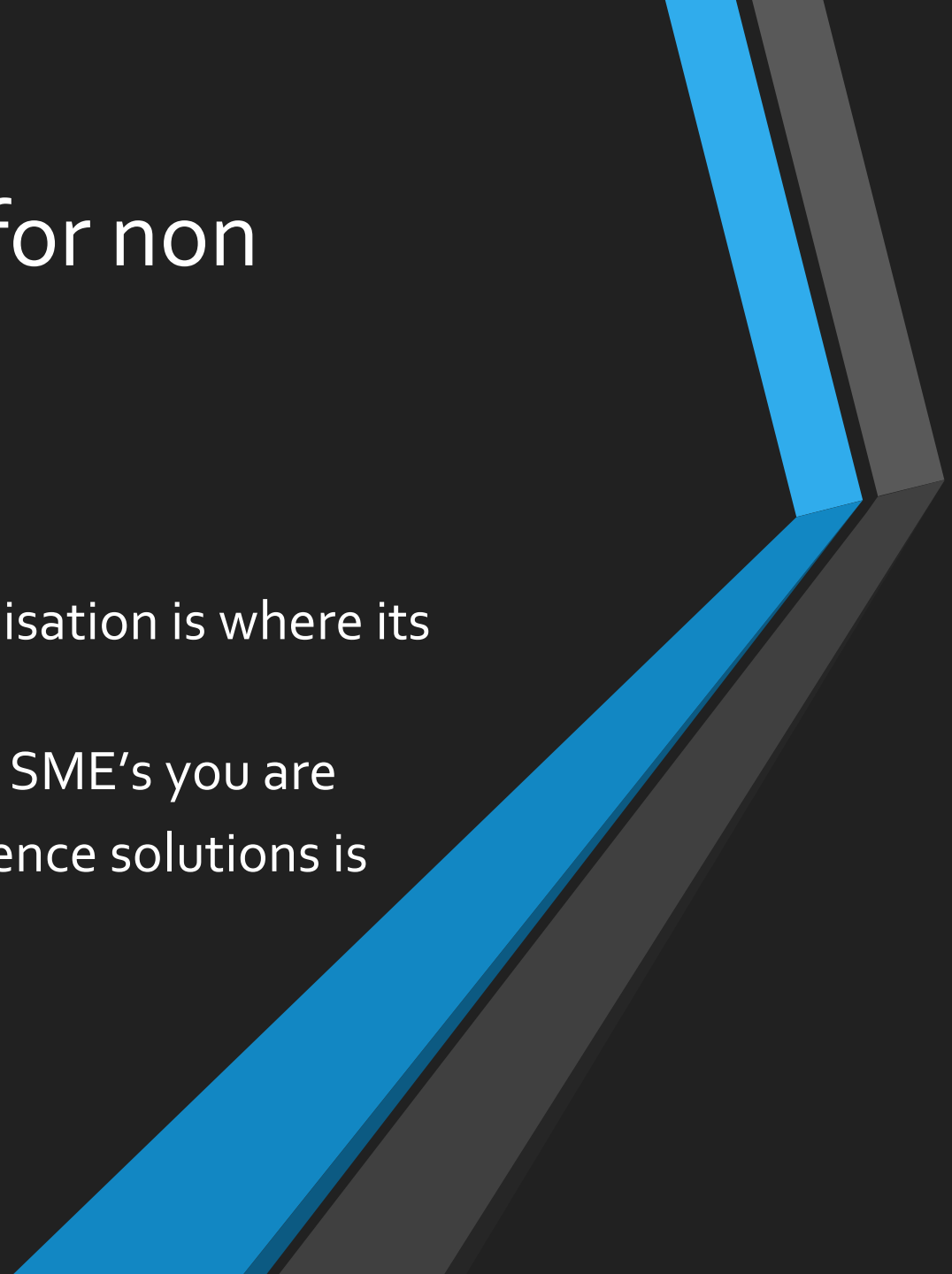


Data Science or Machine Learning

- A common buzz term is the use of Machine Learning
 - Machine Learning is a subset of Data Science
 - It sits within the quantitative skills
 - To implement it other skills will be required
 - The implementation element will be covered later
- 

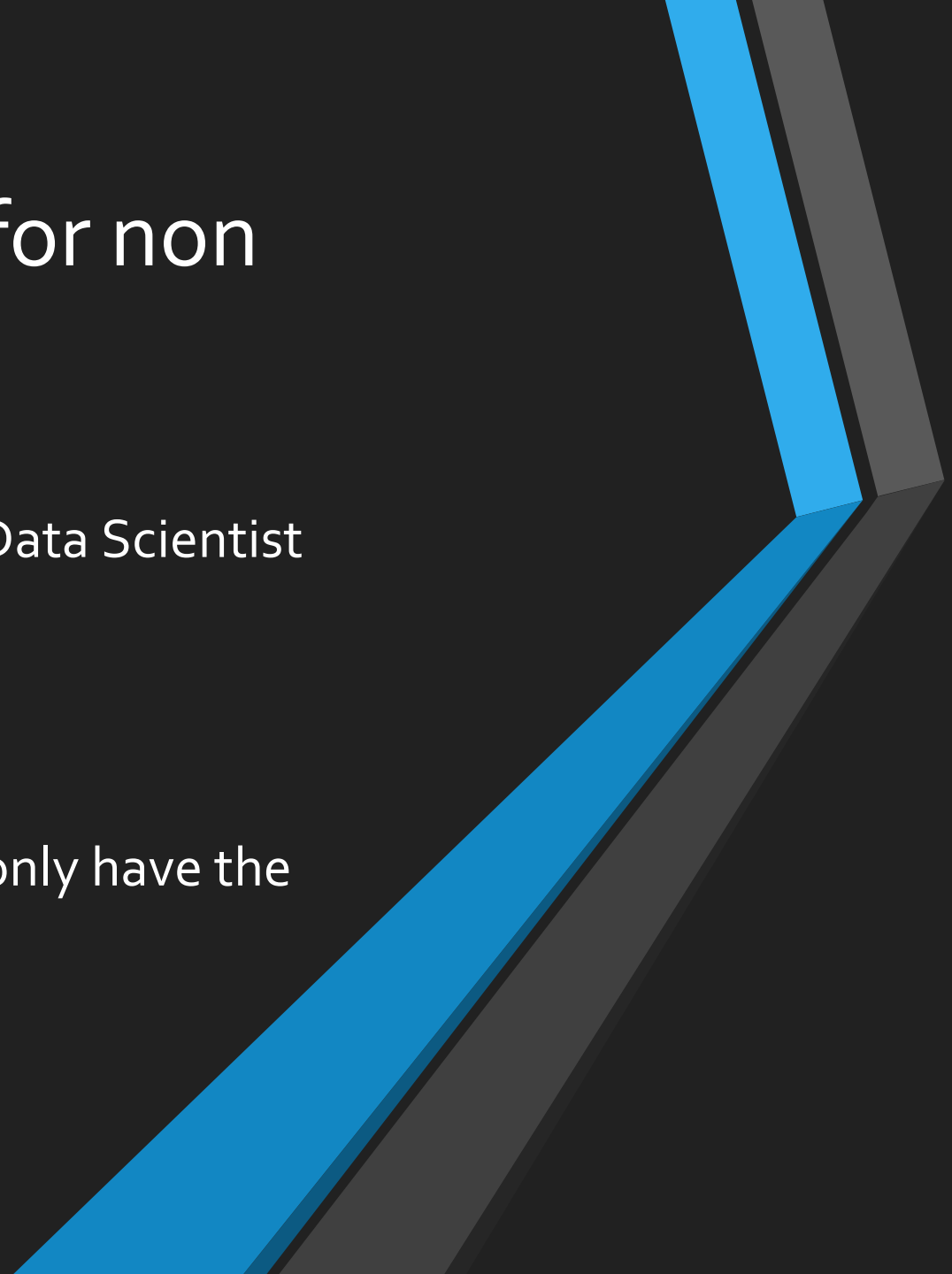


How to use Data Science for non Data Scientists

- Data Science is not best kept in a silo
 - Integrating Data Science within an organisation is where its most effective
 - Data Scientists should not be considered SME's you are
 - Linking business problems with Data Science solutions is the key to success
 - But how?
- 




How to use Data Science for non Data Scientists

- Non Data Scientists need to think like a Data Scientist
 - Data, evidence, Decisions
 - Automation
 - Innovation
 - You don't have to have the answers but only have the questions
- 

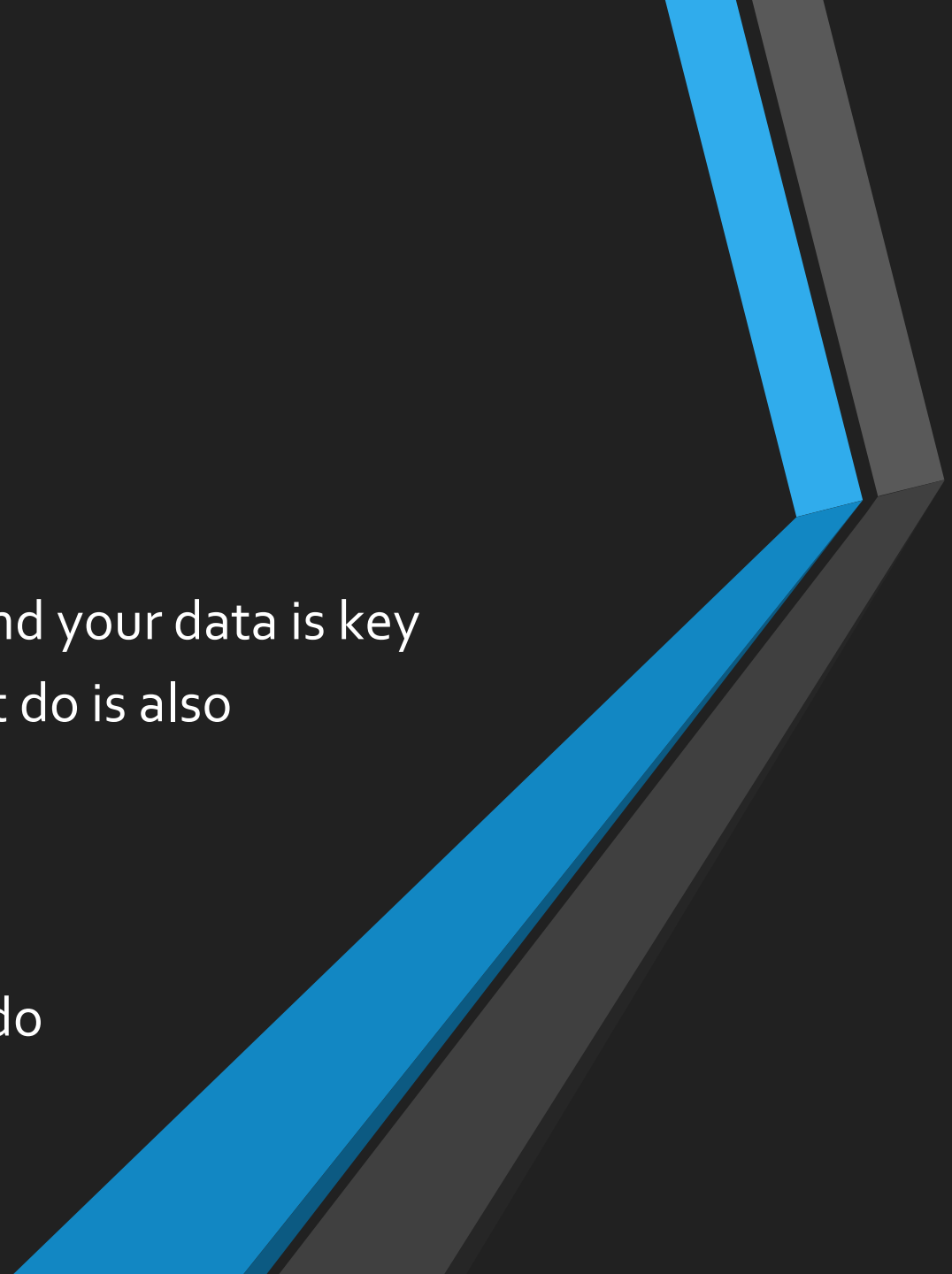


Data Science Approaches

- We can classify problems as
 - Retrospective
 - Predictive
 - Regardless of the problem both rely on historical data
- 

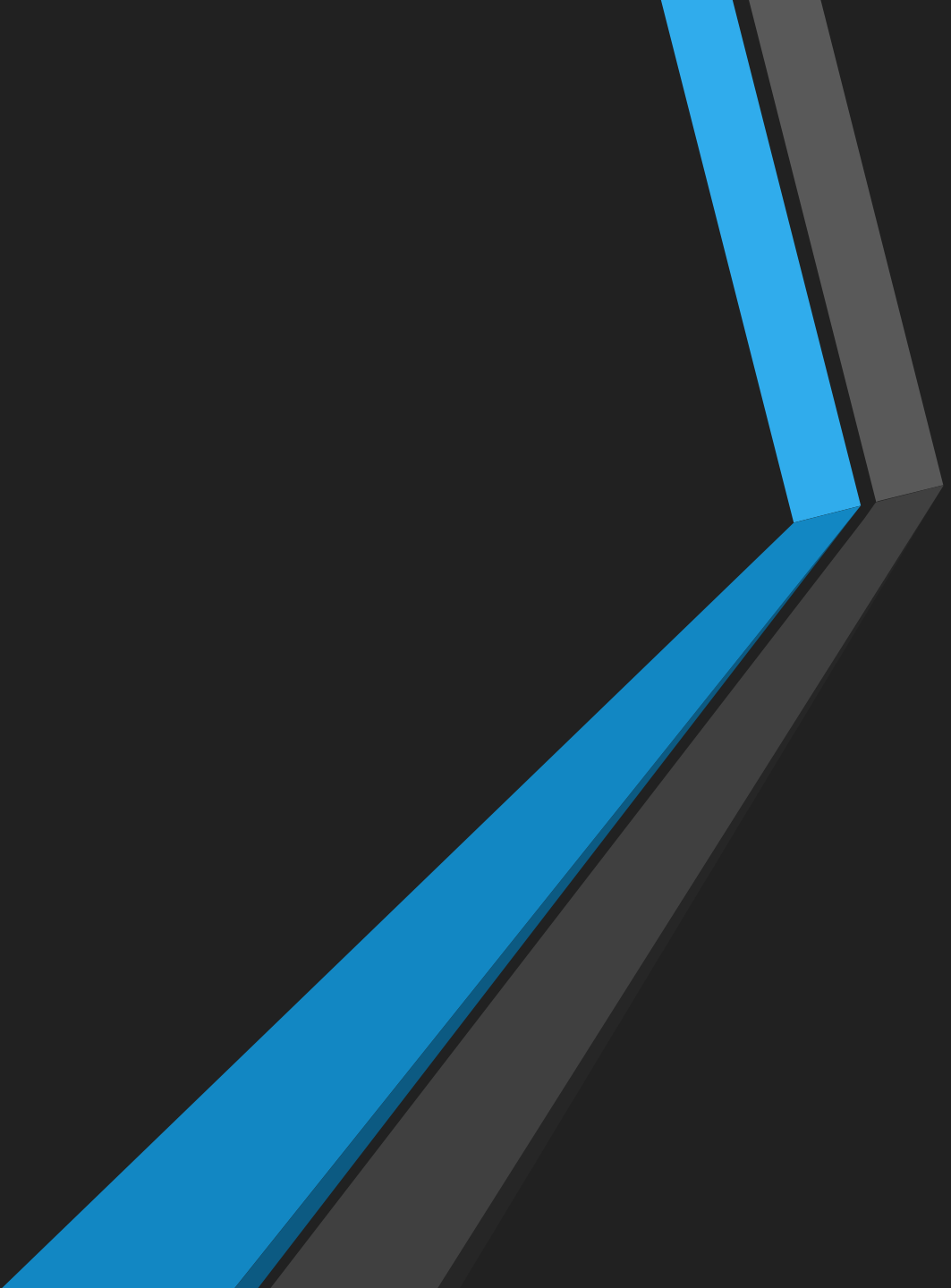


The Data in Data Science

- Bad data in equals bad science out
 - Understanding the importance of data and your data is key
 - Having an appreciation of what data cant do is also important
 - Small sample size
 - Bad quality
 - Data should be at the heart of what you do
- 




Examples of Data Science

- Data Analysis
 - Hypothesis testing
 - Forecasting
 - Language processing
- 




Data Analysis

- Works with data at a raw level
 - Perform complex manipulation on large or messy data
 - Produce common statistical measures mean, mode etc
 - Produce graphical representations
 - Automate report generation
- 




Data Analysis: Examples

- Generate reports with multiple sources of data
 - Manipulate large datasets into summary statistics
 - Produce complex graphics using data
 - Produce descriptive statistics
- 




Hypothesis testing

- Assessing if a claim or idea holds up
 - Uses statistical tests to assess evidence at a level of confidence
 - Is the output x the same as y
 - Is there a difference between two means
 - Are variables associated
- 




Hypothesis testing: Examples

- Is there a statistical difference between the expected and observed values
- 

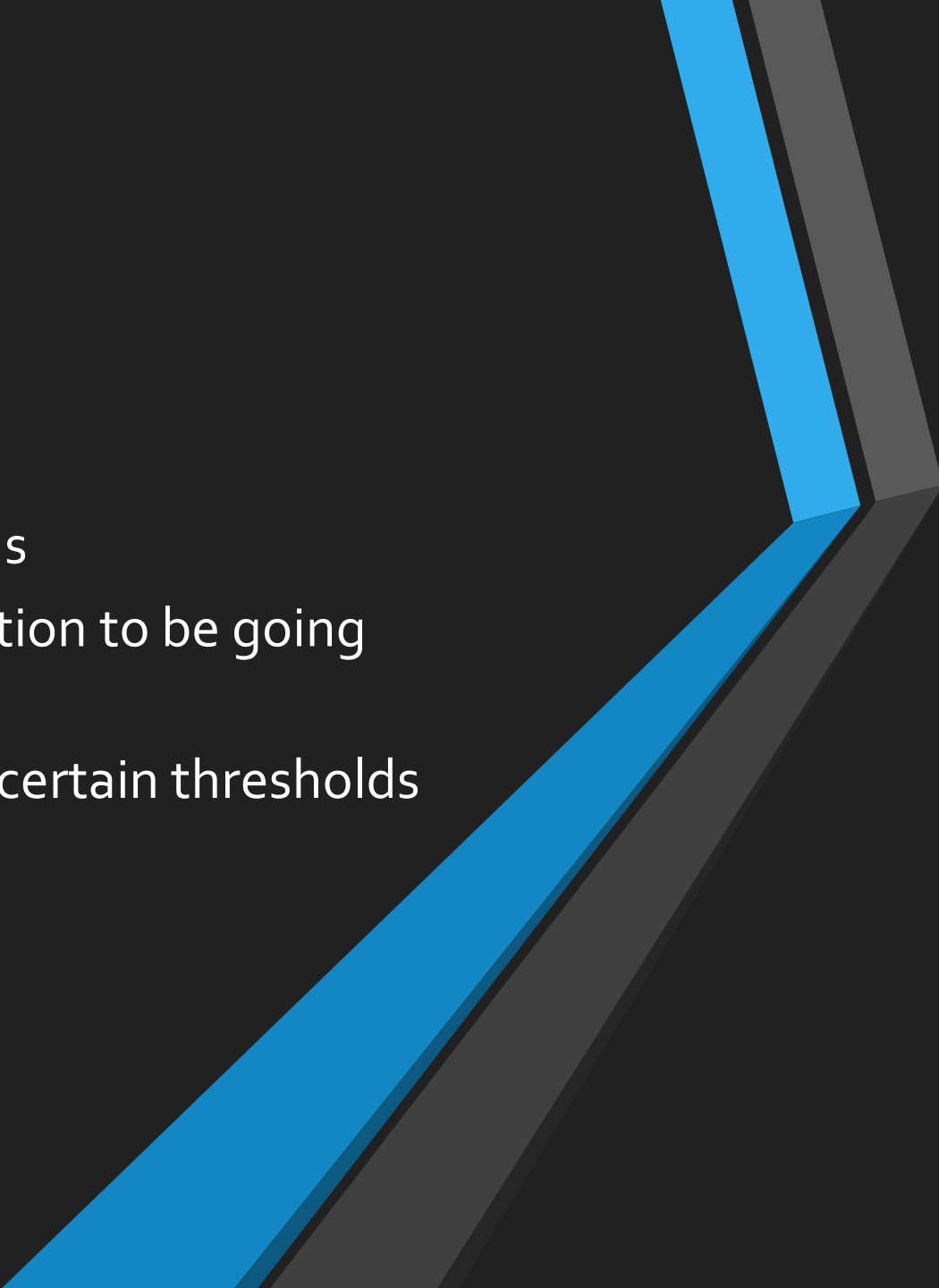


Forecasting

- Looking to make inferences in the future
 - Uses previous data to model the process allowing future predictions to be made
 - Model a distinct values change
 - Model a process
 - Offer probabilistic scenario planning
- 




Forecasting: Examples

- What will revenue look like going forwards
 - What do we estimate our customer retention to be going forwards
 - What are the chances of our sales hitting certain thresholds under different scenarios
- 




Language processing

- Manipulation and modelling of textual data
 - Uses historical pre trained datasets to allow complex analysis
 - Can look for similarity between values
 - Can analyse sentiment of values
- 

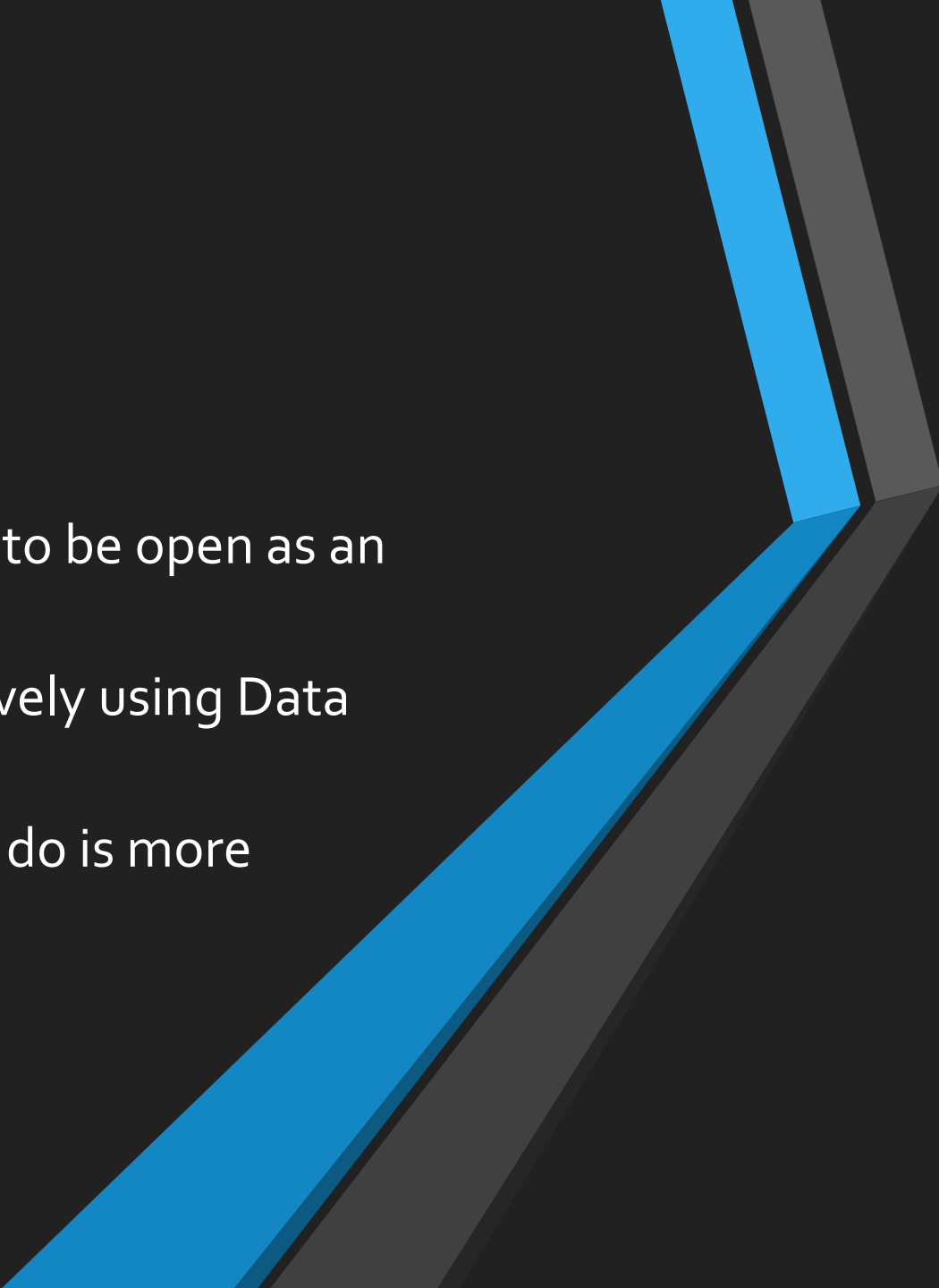


Language processing

- Automating processing of text documents
 - Sentiment analysis of responses
 - Classification into groups
- 

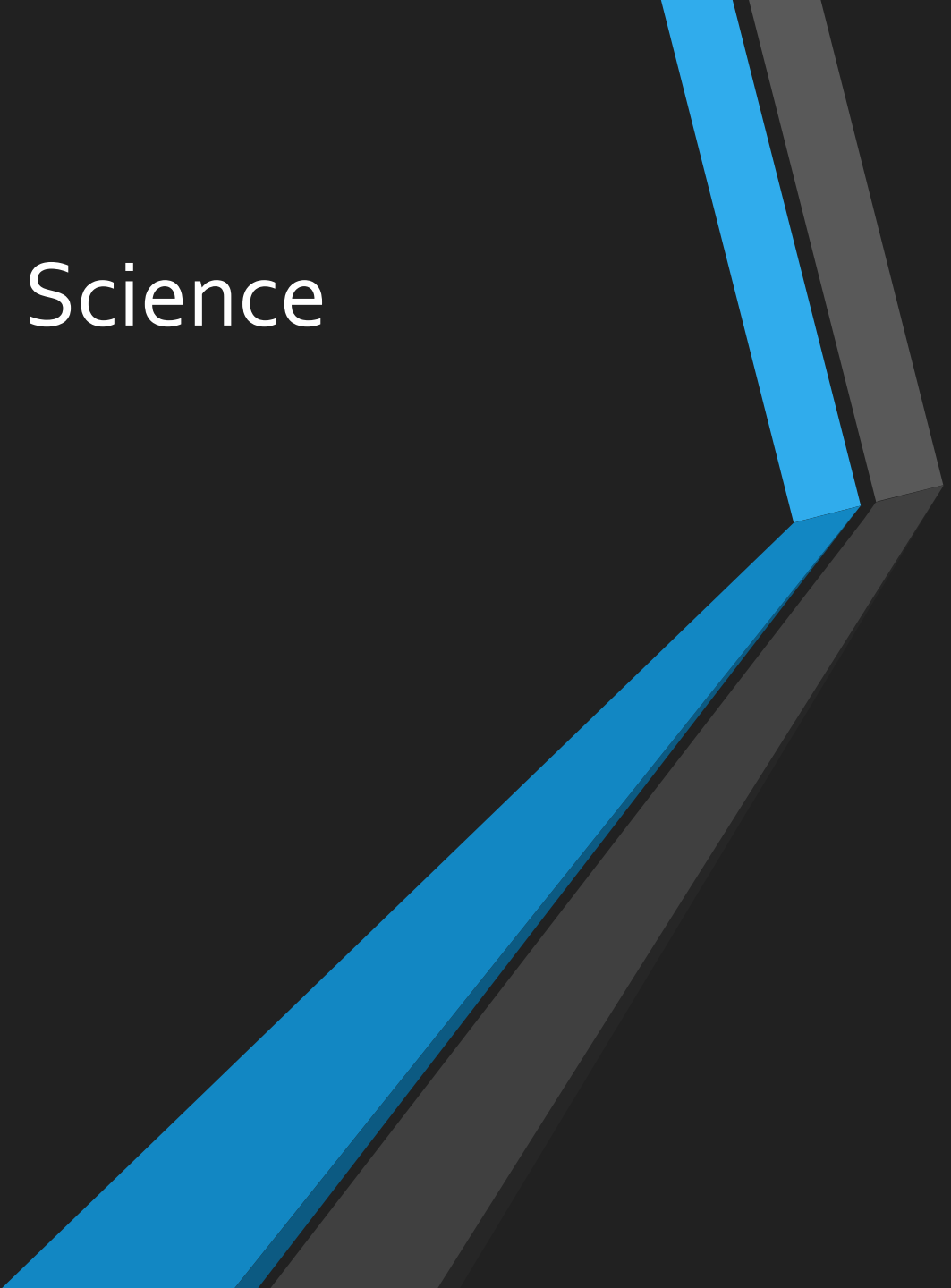


Lessons to learn

- To effectively use Data Science you need to be open as an organisation
 - As the SME your input is crucial to effectively using Data Science
 - Being able to know broadly what you can do is more important than knowing how to do
- 



Moving forward with Data Science

- Don't try and do everything at once
 - Start small and build up
 - Keep iterating on what you have done
 - Embrace the culture of being data driven
 - Try and enjoy the journey
- 

Questions

