



Institute  
and Faculty  
of Actuaries



# Social Media Analytics for Stock Market – An Actuary's Perspective

Mahidhara Davangere V, AIA, AIAI  
MBA, MFC, MSc (Maths)  
Managing Director  
**Pramartha Investment Partners**





Institute  
and Faculty  
of Actuaries



# Social Media Analytics for Stock Market - An Actuary's Perspective

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

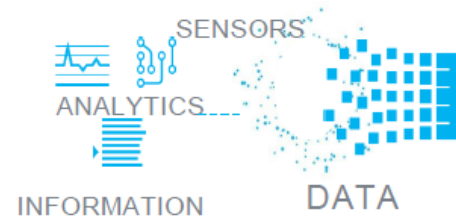
The views expressed in this presentation are those of the presenter.

# Businesses Undergoing Significant Change

## Changing Customer Expectations



## The Explosion of Data



## Changing Risks



## Transition in the Workforce



# TECHNOLOGY AND LARGE VOLUMES OF DATA TRANSFORMING BUSINESS

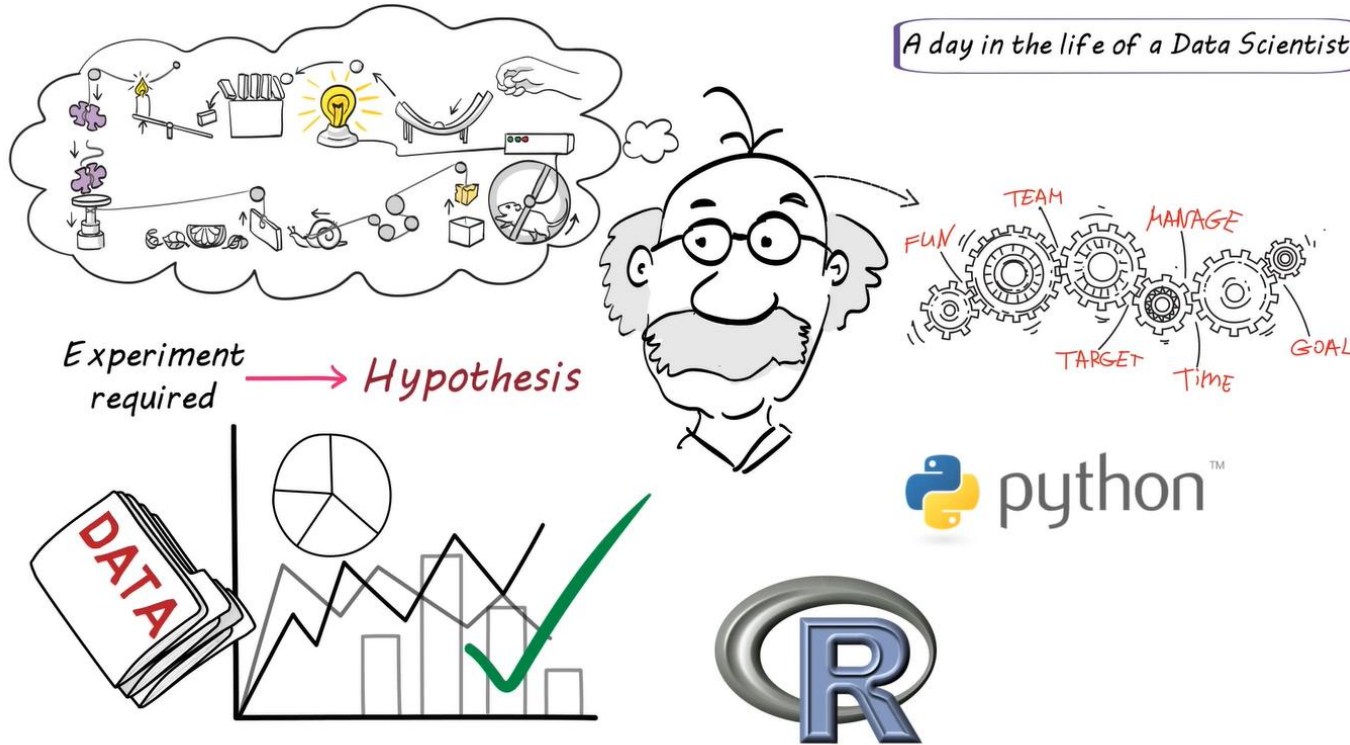
# Drivers of Change – Data Science and AI



**Data**  
Is The New Oil

# Data Science and Analytics – A necessity

*A day in the life of a Data Scientist*



# Social Media – An Ocean of Unstructured Data



# Social Media Analytics – Driving Insights



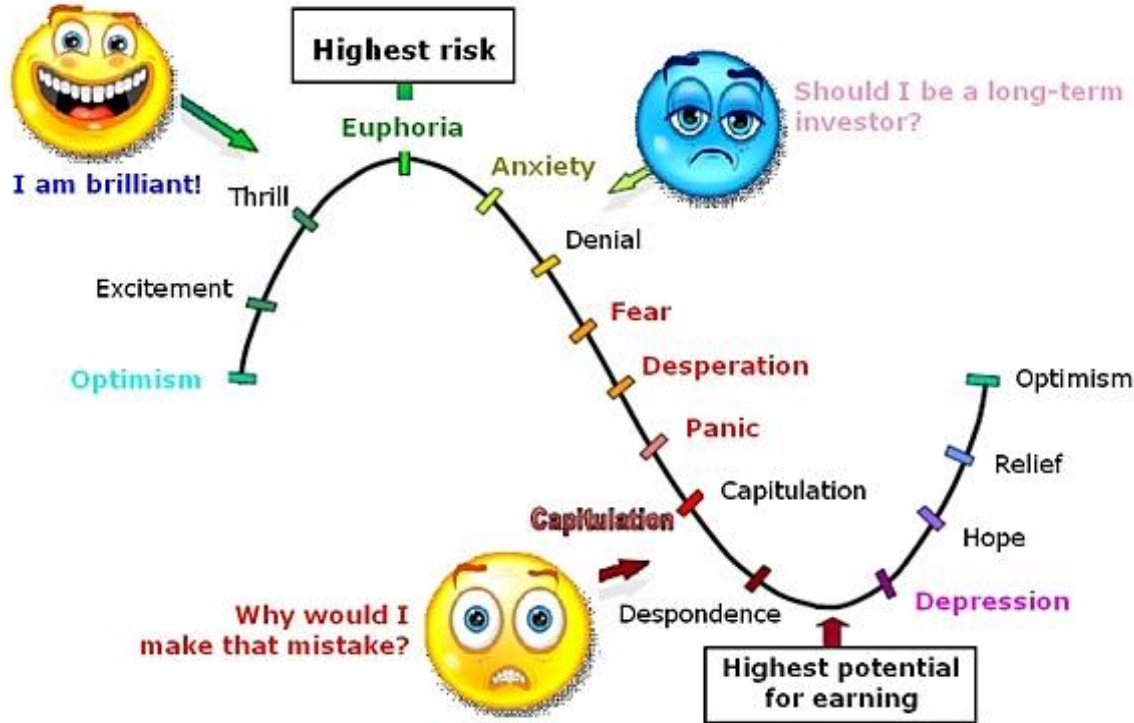


# Understanding Market Sentiment

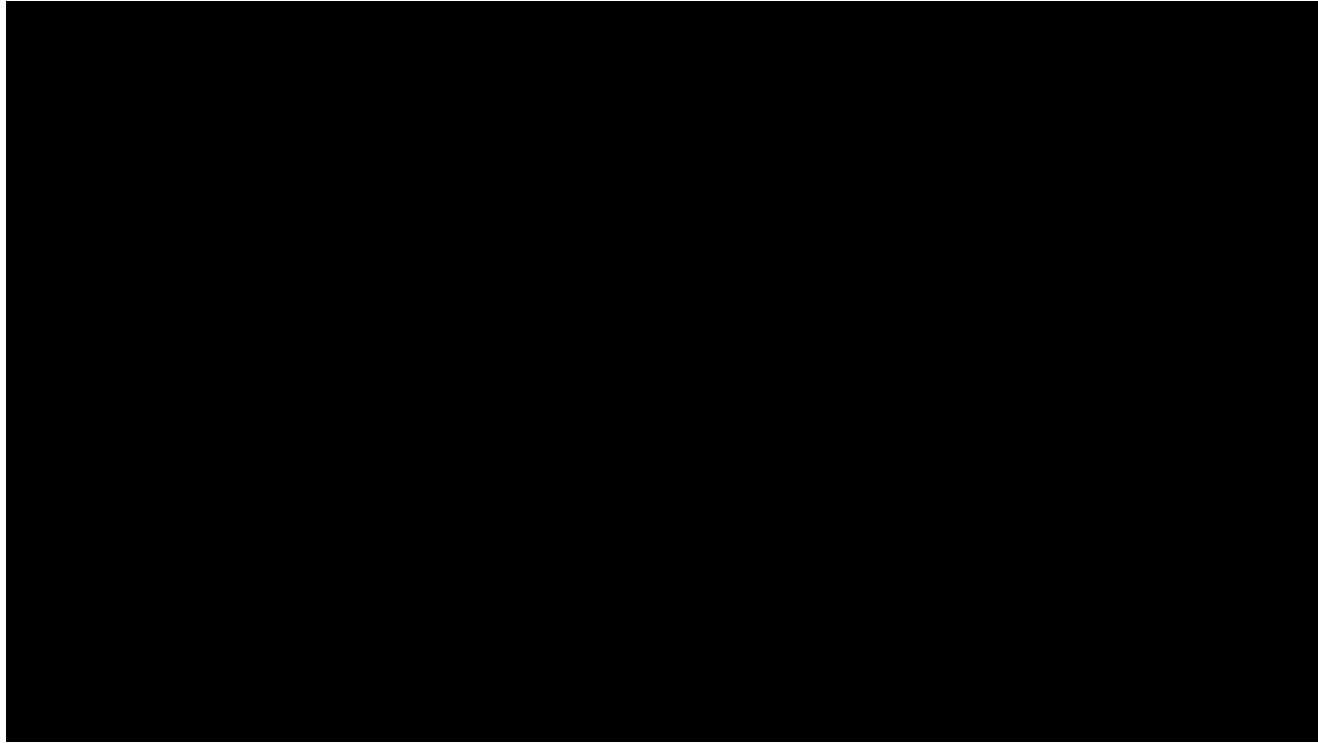




# Market Sentiment Cycle



# Emotional Analysis – Social Media Data



# Twitter reveals Market Sentiments

## Twitter: The New Way to Invest

By Seth Fiegerman

**The MainStreet Newsletter:**  
The best thing to hit your inbox. SIGN UP!

Enter email address

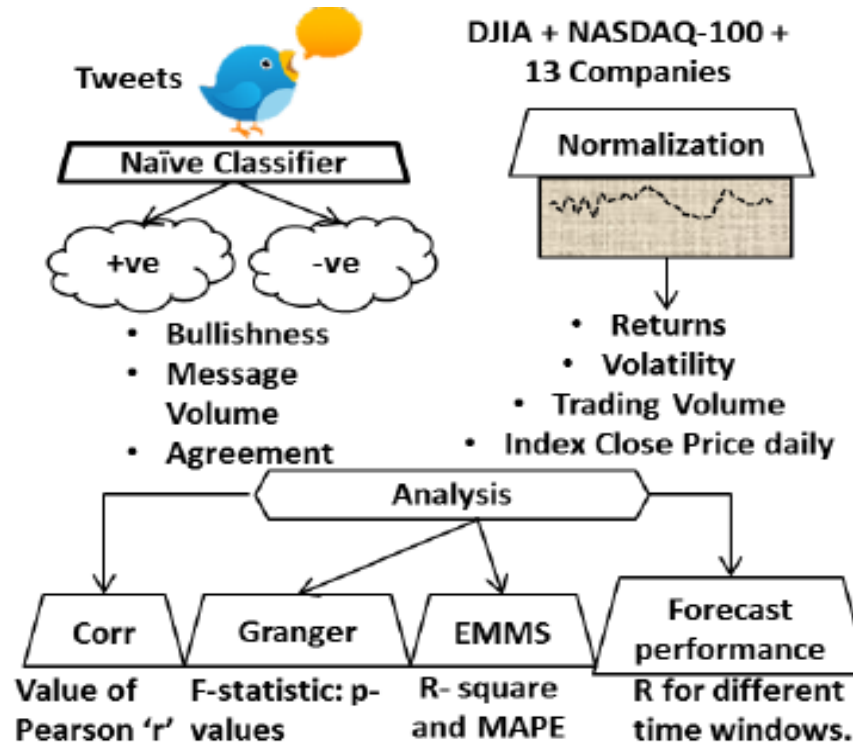
According to a **study** released this month from Indiana University, it is actually possible to use Twitter to determine the public mood, which in turn **can** help predict the ebb and flow of the **stock** market.



# Platforms following tweets vs stock correlation



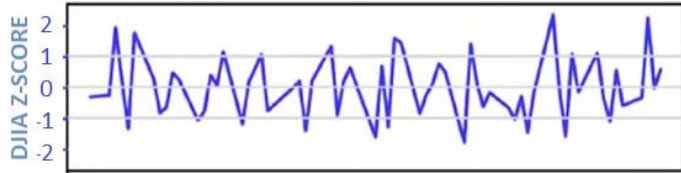
# Twitter Emotion and Sentiment Analysis



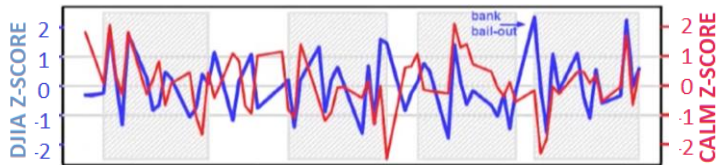
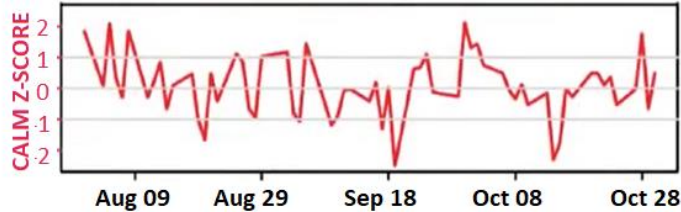


# Twitter Mood Index vs Dow Jones Values

Dow Jones closing values



Values of Calm mood

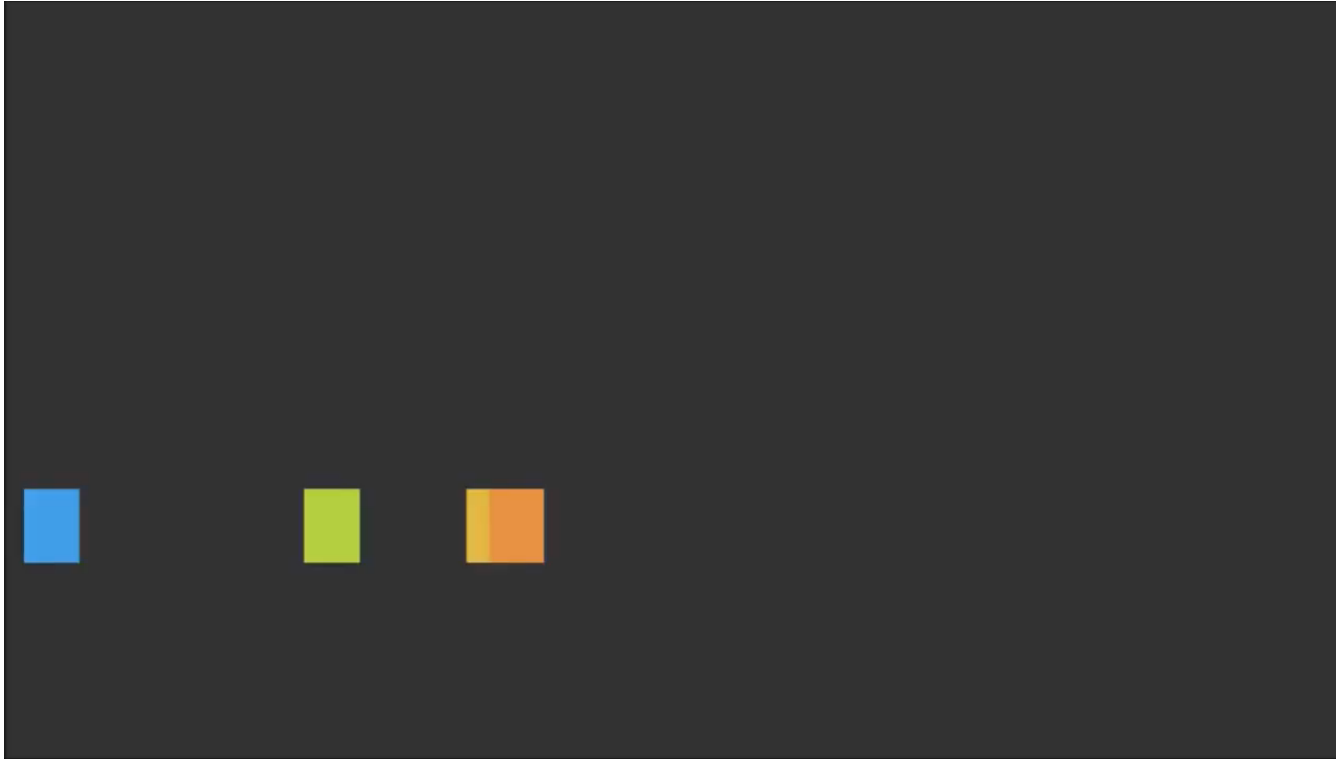


Source: Indiana University

The Z-scores of DJIA Index correlates with the Z – scores of Calm mood Twitter index observed for a period of 3 months in US



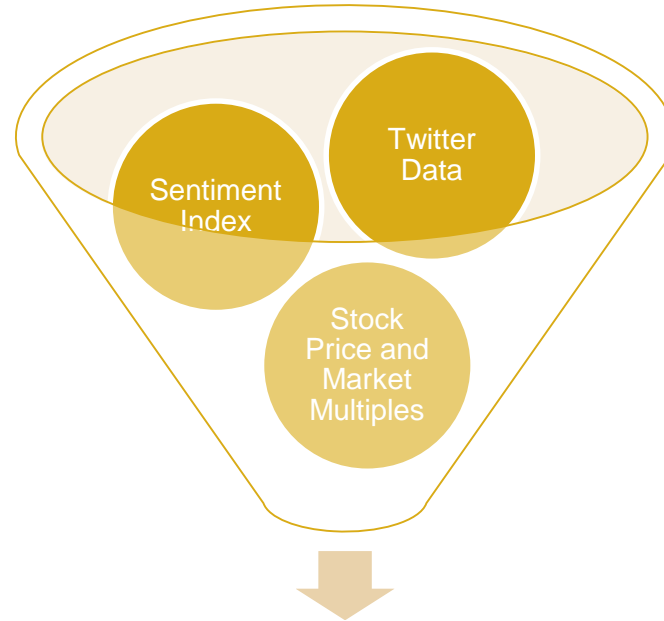
# Twitter Sentiment Analytics for Stock Market





# Real life CASE study

Fintech firm in Australia uses Twitter Sentiment Index comparing with other stock selection metrics for Portfolio Management by Small Cap fund Managers



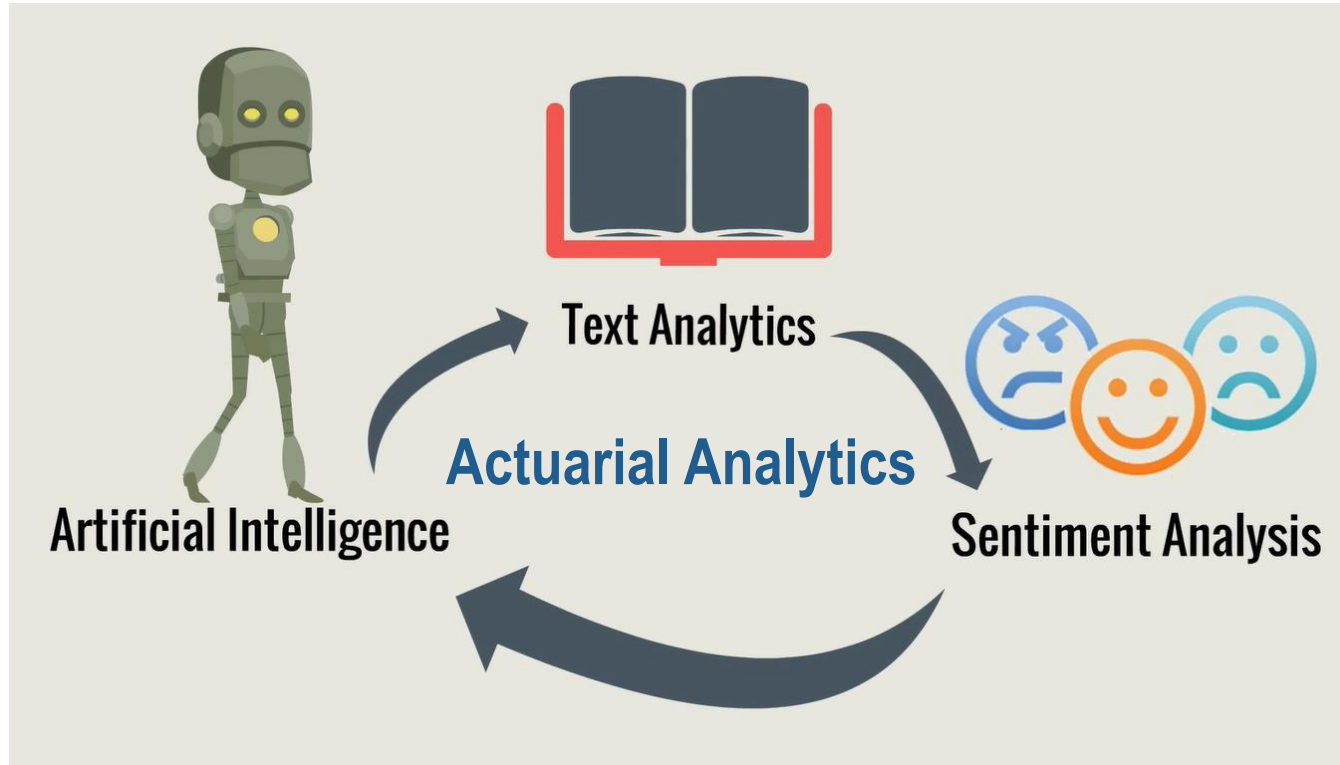
Portfolio Stock Selection

# Actuarial Analytics for Social Media

1	Actuarial Analytics	Relevance
1	Naïve Bayes Classifier Algorithm	Predicting emotions on contextual polarity distribution
2	Granger Causality Test	Past values of sentiment and emotion correlated with current prices
3	Linear Regression	Past values of price with past values of emotions
4	Time Series ARIMA Models	Stock Market Movements
5	Black-Scholes Merton	Positive and Negative word Mood pricing



# Bringing Actuarial Knowledge to new domain



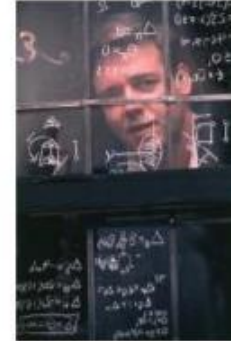
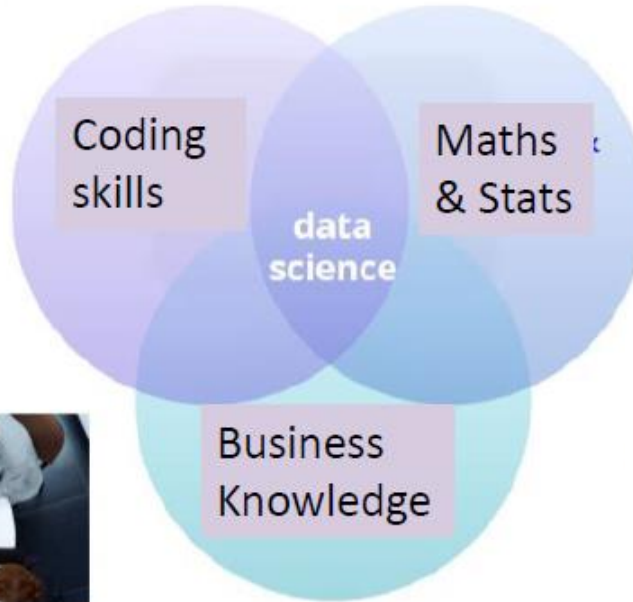
# Actuaries as Data Scientists OR BUSINESS SCIENTISTS



Programming &  
data manipulation



Business Knowledge + company data



Understanding  
Algorithms and  
Validation framework

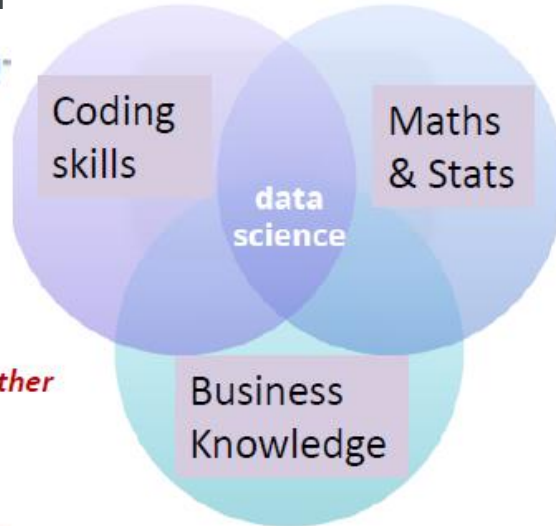
# Are Actuaries Ready – The required Skillset

Programming &  
data manipulation



*Let Machines do the coding*

*Actuaries collaborating with other  
professionals*



Understanding Algorithms and  
Validation framework



*Off the shelf  
algorithms from open  
source  
Working knowledge  
is sufficient*

Business Knowledge +  
company data



Institute  
and Faculty  
of Actuaries

# Transforming the Actuarial Profession - IFOA

- Curriculum change bringing it closer to Broader Data Science skillset
  - CT Series transformed to Core Business, Core Statistics and Core Modeling
  - R programming integral part of syllabus across all the Actuarial Associations
- Introduction of various roles for Actuaries besides Fellowship
  - Chartered Actuary (for Associates as Generalists)
  - Chartered Enterprise Risk Actuary (CERA- risk related roles)
  - Certified Actuarial Analysts (CAA - at entry level)





# Initiatives of the Actuarial Associations Worldwide

- International Actuarial Association - Big Data Working Party
- Institute and Faculty of Actuaries - MAID Working Party
- Institute of Actuaries of India - Wider Area Working Party
- Actuarial Society of South Africa - Business Intelligence forum
- Canadian Institute of Actuaries - Predictive Modeling Committee
- Casualty Actuarial Society - New Qualification CSPA
- Institute of Actuaries of France - Big Data Committee





# The Road Ahead

- Data Science, Artificial Intelligence, Machine Learning, Internet of things and Social Media represents a major opportunity for the actuarial profession
- Actuaries and aspiring actuaries should explore and venture into newer fields
- Co-operation between different actuarial associations will enable the profession to make the most of the opportunity ***otherwise we may become marginalized***

**MAHIDHARA DAVANGERE V**  
Email: [mahidhara@pramartha.com](mailto:mahidhara@pramartha.com)



Australia | India | Kenya | Malaysia | South Africa | UAE | US



Institute  
and Faculty  
of Actuaries