

**Programme Director**U Dinesh Kumar

**Dates** 1-6 July 2019

BUSINESS ANALYTICS, QUANTITATIVE TECHNIQUES

# Business Analytics – The Science of Data Driven Decision Making

**Dates:** 1-6 July 2019

## In God We Trust, All Others Must Bring Data

- W Edwards Deming

The theory of bounded rationality proposed by Nobel Laureate Herbert Simon is evermore significant today with increasing complexity of the business problems; limited ability of human mind to analyze the alternative solutions and the limited time available for decision making. Introduction of Enterprise Resource Planning (ERP) systems has ensured availability of data in many organizations: however, traditional ERP systems lacked data analysis capabilities that can assist the management in decision making. Business Analytics is a multidisciplinary field that uses expertise such as statistical learning. machine learning, artificial intelligence, computer science, information technology and management strategies to generate value from data. Business Analytics is likely to become one of the main functional areas in most companies. Analytics companies develop the ability to support their decisions through analytic reasoning using variety of statistical and machine learning techniques. Thomas Davenport in his book titled. "Competing on analytics: The new science of winning", claims that a significant proportion of high-performance companies have high analytical skills among their personnel.

In an article<sup>1</sup> based on a survey of nearly 3000 executives, MIT Sloan Management Review reported that there is striking correlation between an organization's analytics sophistication and its competitive performance. The biggest obstacle to adopting analytics is the lack of knowhow about using it to improve business performance. Business Analytics uses statistical, machine learning, operations research and management tools to drive business performance. Many companies offer similar kind of products and services to customers based on similar design and technology and find it difficult to differentiate their product/service from their competitors. However, companies such as Amazon, Google, HP, Netflix, Procter and Gamble and Capital One uses analytics as competitive strategy. Business Analytics helps companies to find the most profitable customer and allows them to justify their marketing effort,

especially when the competition is very high. There is a significant evidence from the corporate world that the ability to make better decisions improves with analytical skills

#### CONTENT

The course is designed to provide in-depth knowledge of handling data and Business Analytics' tools that can be used for fact-based decision-making using real case studies. Primary objectives of the course are:

- 1. Understand the emergence of business analytics as a competitive strategy.
- Learn to analyze data using statistical learning and machine learning algorithms to enable data driven decision making.
- 3. Learn data visualization and storytelling through data.
- Learn descriptive, predictive and prescriptive analytics techniques and tools.
- 5. Learn to analyze data using supervised and unsupervised machine learning algorithms.
- Use analytics in customer requirement analysis, general management, manufacturing, marketing, finance, operations and supply chain management.
- Analyse and solve problems from different industries such as manufacturing, service, retail, software, banking and finance, sports, pharmaceutical, aerospace etc.
- Hands on experience with software such as Microsoft Excel, Evolver, LINDO, SPSS, R, Python and other proprietary software.

#### WHO SHOULD ATTEND?

In October 2012, Harvard Business Review claimed that "Data Scientists" will be the sexiest job of the 21st century. Anyone who is looking for "sexiest job" should attend this course. This short-duration programme will equip the participants with analytical tools and prepare them for corporate roles in analytics based consulting in marketing, operations, supply chain management, finance, insurance and general management in various industries. The course is suitable for those who are already working in analytics to enhance their knowledge as well as for those with analytical aptitude and would like to start new career in analytics.

#### **COURSE CONTENTS:**

# Predictive Analytics using Supervised Learning Algorithms:

Simple linear regression: coefficient of determination, significance tests, residual analysis, confidence and prediction intervals.

Multiple linear regression: coefficient of multiple coefficient of determination, interpretation of regression coefficients, categorical variables, heteroscedasticity, multicollinearity, outliers, auto-regression and transformation of variables.

Logistic and Multinomial Regression.

#### **Classification and Regression Trees (CART):**

Forecasting: Moving average, exponential smoothing, Trend, cyclical and seasonality components, ARIMA (autoregressive integrated moving average).

Application of predictive analytics in retail, direct marketing, health care, financial services, insurance, supply chain etc.

#### **Ensemble Methods:**

Introduction to ensemble methods, random forest and boosting algorithms

#### **Reinforcement Learning Algorithms:**

Markov chain and Markov Decision Process

#### **Prescriptive Analytics:**

Introduction to Operations Research (OR), linear programming (LP), formulating decision problems using linear programming, sensitivity analysis: shadow price and reduced cost. Multi-period LP models. Applications of linear programming in product mix, blending, cutting stock, transportation, transshipment, assignment, scheduling, planning and revenue management problems.

Integer Programming (IP) problems, mixed-integer and zero-one programming. Applications of IP in capital budgeting and set covering.

Multi-criteria decision making (MCDM) techniques: Goal Programming (GP) and analytic hierarchy process (AHP) and applications of GP and AHP in solving problems with multiple objectives.

The following analytics cases studies published by IIMB at the Harvard Business publishing will be used during the short-duration programme in addition to several examples from various sectors.

- Marketing Head's Conundrum at WSES
- Package Pricing at Mission Hospitals
- Predicting earnings manipulations by Indian firms through machine learning algorithms
- Customer Analytics at Flipkart
- Customer Analytics at Bigbasket: Product Recommendations
- Pricing of Players in the Indian Premier League.
- A game of two halves: In-play betting in football.

- 1920 Evil Returns Bollywood and Social Media Marketing.
- Apollo Hospitals Differentiation Through Hospitality.
- Consumer Choice Between House Brands and National Brands in Detergent Purchases at Reliance Retail.
- Breaking Barriers: Micro-mortgage Analytics.

#### **TESTIMONIAL**

It is an excellent course with a wonderfully engaging faculty. Most importantly, the course covers industry-use cases, in conveying problem statements. This helps participants to connect to new concepts and techniques easily within a limited time period. Prior to attending this course, I had started working in the related area of machine learning from a managerial perspective of identifying adoption-use cases. Having attended this course, it now provides me with deeper insights of required technical skills as well as a business perspective, which helps me gain a lot of confidence in my approach. Overall, this programme provides a very good foundation for building a career in related areas.

Mr. Sreekanth Pallavoor

Operations Director, HCL Technologies

### PROGRAMME DIRECTOR



#### U Dinesh Kumar Professor Quantitative Methods & Information Systems

Ph. D. (Mathematics), IIT Bombay, India, 1994

M.Sc. (Applied Sciences - Operations Research), P.S.G College of

Technology, Coimbatore, India, 1990

B. Sc., Coimbatore Institute of Technology, India, 1987

Professor U Dinesh Kumar is a Professor in Decision Sciences at Indian Institute of Management Bangalore. Dr Dinesh Kumar has over 22 years of teaching and research experience. Prior to joining IIM Bangalore, Dr Dinesh Kumar has worked at several reputed Institutes across the world including Stevens Institute of Technology, USA; University of Exeter, UK; University of Toronto, Canada; Federal Institute of Technology, Zurich, Switzerland: Queensland University of Technology. Australia; Australian National University, Australia and the Indian Institute of Management Calcutta. He is the author of the best selling book titled, "Business Analytics - The Science of Data Driven Decision Making", published by Wiley. Dr Dinesh Kumar has published 35 case studies at the Harvard Business Publishing on the use of Analytics by Indian and Multi-National Companies.

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<sup>&</sup>lt;sup>1</sup> M S Hopkins, S LaValle, F Balboni, N Kruschwitz and R Shockley, "10 Insights: A First look at The New Intelligence Enterprise Survey on Winning with Data", MIT Sloan Management Review, Vol. 52, No. 1, 21–31.

The Indian Institute of Management Bangalore (IIMB) is a leading graduate school of management in Asia.

Established in 1973, IIMB today offers a range of post-graduate and doctoral level courses as well as executive education programmes. With a faculty body from amongst the best universities worldwide, IIMB has emerged as a leader in the area of management research, education and consulting. IIMB's distinctive feature is its strong focus on leadership and entrepreneurial skills that are necessary to succeed in today's dynamic business environment.

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- 2-year weekend Post Graduate Programme in Enterprise Management (PGPEM)
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- Fellow Programme in Management (FPM, doctoral programme)

IIMB has obtained the European Quality Improvement System (EQUIS) accreditation awarded by the European Foundation for Management Development (EFMD). IIMB has been ranked No. 1 in the India Rankings 2019 in the Management Education category under the National Institutional Ranking Framework (NIRF) by the MHRD. IIMB has been ranked among the Top-70 global schools by the Financial Times Executive Education Rankings 2018.



**VENUE:** Indian Institute of Management Bangalore



#### **LAST DATE FOR REGISTRATION: 21 June 2019**



#### PROGRAMME FEE AND PAYMENT

INR 1,26,000/- Residential and INR 1,05,000/- Non-Residential (+ Applicable GST) per person for participants from India and its equivalent in US Dollars for participants from other countries.

The programme fee should be received by the Executive Education Office before the programme commencement date. In case of cancellations, the fee will be refunded only if a request is received at least 15 days prior to the start of the programme. If a nomination is not accepted, the fee will be refunded to the person / organisation concerned.



#### DISCOUNT

**Early Bird Discount:** Nominations received with payments on or before 10-June-19 will be entitled to an Early Bird Discount of 10%.

Early Bird Fee (Residential) INR 1,13,400/- (+ Applicable GST) Early Bird Fee (Non-Residential) INR 94,500/-(+ Applicable GST)

Please Note: All enrolments are subject to review and approval by the programme director. Joining Instructions will be sent to the selected candidates 10 days prior the start of the programme. Kindly do not make your travel plans unless you receive the letter from IIMB.

A certificate of participation will be awarded to the participants by IIMB.



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#### **VISION**

To be a global, renowned academic institution fostering excellence in management, innovation and entrepreneurship for business, government and society

#### Registration

Please logon to IIMB website www.iimb.ac.in/ eep for registering online. Do feel free to get back to us if you should have any clarification.

#### **Executive Education Programmes**

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