



Two-Day Workshop on **DATA ANALYTICS FOR ENGINEERS**

26 - 27 August 2017

Engineer Bhawan, Doranda, Ranchi



Organised by

The Institution of Engineers (India)

Jharkhand State Centre, Ranchi

Under the aegis of

Mechanical Engineering Division Board, IEI

About the Institution of Engineers (India)

The Institution of Engineers (India) or IEI is the largest multidisciplinary professional body that encompasses 15 engineering disciplines and gives engineers a global platform from which to share professional interest. IEI has membership strength over 8,00,000. Established in 1920, with its HQs at 8 Gokhale Road, Kolkata 700020, IEI has served the engineering fraternity for over nine decades. In this period of time it has been inextricably linked with the history of modern-day engineering.

In 1935, IEI was incorporated by Royal Charter and remains the only professional body in India to be accorded this honour. Today, its quest for professional excellence has given it a place of pride in almost every prestigious and relevant organization across the globe. IEI functions among professional engineers, academicians and research workers. It provides a vast array of technical, professional and supporting services to the Government, Industries, Academia and the Engineering fraternity, operating from over 120 Centres located across the country. The Institution has established R&D centres at various locations in the country and also provides grant-in-aid to its members to conduct research and development on engineering subjects.

IEI conducts Section A & B Examinations in different Engineering disciplines, the successful completion of which is recognized as equivalent to Degree in appropriate field of Engineering of recognized Universities of India by the Ministry of Human Resources Development, Government of India. Every year as many as 90000 candidates appear for these exams.

For details, please see: www.ieindia.org.

The Institution of Engineers (India), Jharkhand State Centre

From a little hut to a campus with a two storied building, two-conference halls, each capable of seating 100 people, office, library, guest house and an auditorium for 300 people, 3 class rooms for continuous education has been an impressive journey. This has been possible only due to the hard work by fellow members, State Government, Public Sector Undertakings and Private Sector Organisations. At present around 3000 members including Associates, 7500 student members are enrolled with Jharkhand State Centre. This is an achievement in comparison to 87 corporate members in 1961. Jharkhand State Centre is designated as 'A' category centre by the Institution of Engineers (India). The centre has been actively engaged in voicing its concerns over many issues from time to time and call on engineers to face the challenges to emphasis on the engineer's role in Society and engineers as managers. The Centre has been organising cultural programmes to inculcate bond among members and their families. Independence Day and Republic Day are celebrated with family members every year. Telecom Day and World Environment Day are also celebrated every year.

For details please visit: www.ieijsc.org

Theme of the Workshop

Data Analytics is the science of examining raw data with the purpose of drawing conclusions about that information. It involves applying algorithms or statistical tools to derive insights. It is used in several industries to allow the organizations make better decisions as well as verify and disprove existing theories or models. The focus of Data Analytics lies in inference, which is the process of deriving conclusions that are solely based on facts the analyst already knows.

Data analytics helps organizations harness their data and use it to identify new opportunities. Which in turn, leads to smarter business moves, more efficient operations, higher profits and customer satisfaction. There is no single tool that encompasses data analytics but in reality several types of tools work together to help get the most value from the information.

Predictive analytics uses data, statistical techniques to identify the likelihood of future outcomes based on historical data. It is all about providing a best assessment on what will happen in the future, so organizations can feel more confident that they are making the best possible business decision.

The workshop is designed for practicing engineers, plant managers and decision makers from industries to effectively utilize the data for better inference. The post lunch sessions of the workshop will be to give hands-on experience to the participants with software (MS-Excel®/Minitab®) applications to hypothetical engineering problems.

Sub-themes :

DAY 1: Data types and applications of data analytics

The data types one may come across in a typical engineering problem can be broadly classified as follows:

- Numerical/ Quantitative (data expressed in numerical or quantitative form)
 - a) Continuous variable
 - b) Discrete variable
- Categorical/ Qualitative (data expressed qualitatively in categories)
 - a) Binary variable
 - b) Nominal variable
 - c) Ordinal variable

The selection of an appropriate analytics tool depends on the data type also. For example, logistic regression and chi-square tests are applicable for categorical data types only.

- Correlation and Scatter plot

Scatter plots are useful to graphically represent the correlation between two quantitative variables or numerical continuous data. Each data pair is represented by a point on the scatter diagram. The correlation may be linear, non-linear (quadratic, cubic etc.) or no correlation.

- Regression Analysis (Bi-variate/Multivariate, Linear/Nonlinear)

When an analyst wants to establish a relationship among independent (predictor or explanatory) variables and one or more dependent (response or outcome) variables, regression analysis is an appropriate statistical tool. It is a technique to determine the linear/nonlinear mathematical relationship between two or more variables. Data from experiments or other sources is available as ordered pairs (y, x) or (y, x₁, x₂..). Using this data a regression equation is framed which can be used to predict or forecast outcomes for known set of inputs.

DAY 2:

- Hypothesis Testing (t/z/Chi test)

Instead of relying on any claim for seemingly obvious data in experiment, a hypothesis test statistically examines the two possible outcomes (H₀ and H₁) with a level of confidence. These two outcomes or hypotheses H₀ (null) and H₁ (alternative or research) are mutually exclusive and exhaustive.

- Test of significance (F-test)

ANOVA test is similar to the t-tests but preferred when more than two samples are involved. The test named after Fisher as F-test.

- Stratification and Pareto Analysis

Sometimes a particular data set collected from several sources need to be classified into different strata according to the source to get better insight into it. Underlying patterns in individual groups may not be visible while in the combined form. Scatter plots with separate colours/symbols for individual groups can show the correlations and Pareto chart can be used in conjunction with stratification to graphically present the criticality of different sources of collected data. This tool is mainly applied during critical problem identification after a data collection exercise.

Computer system with MINITAB® 17 and MS-EXCEL® for practice sessions.

Venue

The workshop will be held on 26th - 27th August 2017 at the Main Hall of the Institution of Engineers (India), Jharkhand State Centre, Nepal Kothi Campus, Doranda, Ranchi.

Important Dates

Last Date of Registration

21st August 2017

Registration

Registration of delegates shall be made well in advance by remitting the registration fees (per delegate) as indicated below alongwith duly filled in registration form.

Sl. No.	CATEGORIES	Indian Rupees
1	Sponsored Delegate (Organisational)	₹ 3,000
2	Spouse of Delegates	₹ 1,000

Courses

Registration Fees The above fee is towards participation in the course, the course material, computer use for tutorials and assignments, and laboratory equipment usage charges.

This course provides an introductory, hands-on treatment of broad aspects of data analytics and data science that is emerging as a vital tool for engineers .

Support

Industries, Government Departments, Government Undertakings, R&D Organizations, Consulting firms, Contractors, Equipment, Manufacturers, Quality Control Organizations, Professional Bodies, Institutes and all concerned are invited to support the event in Platinum, Gold and Silver Categories.

Platinum Support	3 free delegates + 1 inside full page colour advertisement + Name displayed in Platinum Support + 1 Manufacturer's Presentation (15 minutes)	₹ 1,00,000
Gold Support	2 free delegates + 1 inside full page colour advertisement + Name displayed in Gold Support + 1 Manufacturer's Presentation (5 minutes)	₹ 75,000
Silver Support	2 free delegates + 1 inside full page colour advertisement + Name displayed in Silver Support	₹ 50,000

Payment

All payments are to be made through Bank Draft / A/c Payee Cheque, drawn in favour of "The Institution of Engineers (India), Jharkhand State Centre", payable at any of the schedule banks at Ranchi. Online transfer details:

Bank Name: Union Bank of India A/c No: 480102050000259
 IFSC: UBIN0548014 Branch: Shyamali Branch
 PAN: AAATT3439Q

Organising Committee

Chairman : Mr. Sanjay Sen, FIE, Chairman, IEI, JSC

Org. Secy. : Dr. Rajeev Agrawal, BIT Mesra

Convenor : Dr. Sanjay Jha, Head Production Deptt, BIT Mesra

Honorary Secretary : Mr. Manda Rajananda Kumar, IEI, JSC

Members:

Dr. L. N. Pattnaik, BIT Mesra

Mr. Subrato Mukherjee, MECON

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Mr. Manik Mukhpadyay, MECON

Mr. P. Balasubhakar, MECON

Mr. B K Bisoyi, CET, SAIL

Dr. Praveen Mishra, BIT Mesra

Contact

Dr. Rajeev Agrawal

Organising Secretary
 Cell No.: 9631659867
 Email: rajeevag1@gmail.com

Mr. Manda Rajananda Kumar

Honorary Secretary, IEI, JSC
 Engineer Bhawan, Doranda, Ranchi
 Mob.: +91 70138 06680
 email : jharkhandsc@ieindia.org

REGISTRATION FORM
Two-Day Workshop on
DATA ANALYTICS FOR ENGINEERS

To
 The Honorary Secretary
 The Institution of Engineers (India)
 Jharkhand State Centre, Engineer Bhawan
 Nepar Koti Campus, Doranda
 Ranchi - 834 002, India

Dear Sir,

The following persons may please be registered as delegates for participation in the above seminar to be held at Ranchi during 26 - 27 August, 2017.

Sl No.	Name & Designation	Accompanying Spouse (Yes/No)	Category Registration Organizational / Individual/ Educational Institute	Payment Cheque/ Draft No. & Date	Enclosing Amount
1.					
2.					
3.					
4.					
5.					
6.					

SUPPORT

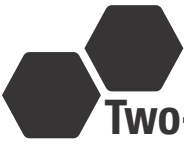
- * Platinum Gold Silver
 * Manufacturers Dinner Lunch
 * High Tea Kit Bag Evening Cultural Programme

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E-mail address :

(Signature with Date)
Name & Designation



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DATA ANALYTICS
FOR ENGINEERS**

26 - 27 August 2017

Engineer Bhawan, Doranda, Ranchi

To,
Mr./Mrs,

From:

Mr. MANDA RAJANANDA KUMAR

Honorary Secretary

IEI, Jharkhand State Centre,

Engineer Bhawan, Nepal House, Doranda, Ranchi

Contact: 0651-2491344

E-mail: jharkhandsc@ieindia.org