# Report on One-day Student Seminar
On
"Applied Mathematics and Computer Science"

The one day student seminar on **"Applied Mathematics and Computer Science"** was organized at Sri R Venkatesh Auditorium on February 22, 2017 at Sambhram Academy of Management Studies, Bangalore. Dr.K.C.Mishra, Principal, Sambhram Academy of Management Studies welcomed the participants and introduced the speaker to all. The speaker was **Prof.T.Shivanandam**, Director, TVC Pvt.Ltd. Bangalore

The session started with introduction of statistics and how statistics is applied in industries and corporate. He explained about statistician Dr. Ishi Kawa, father of 'statistical tool implementation for industry' used stratification tool to analyze the performance of a company in Japan. Stratification is a technique used to divide data into sub–categories or classification to provide useful insight into the problem. He also explained the major steps involved in stratification as how the problem could be solved using that. There are mainly three steps involved in it:

1. List all conditions that may seem to be the cause of the problem.
2. Collect additional data based on classification and stratify those data based on the classification
3. Calculate the average of each data and interpret data.

He has explained the stratification by using a graph, which depicts the study of accidents in a machine shop.
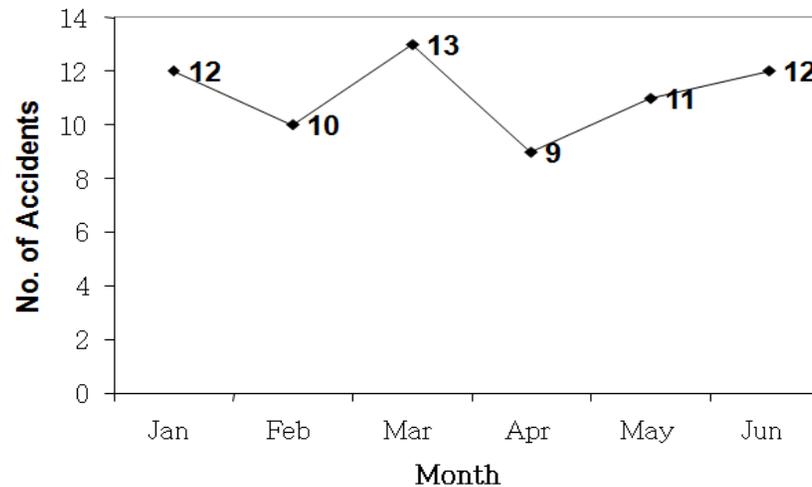
After considering the cause of accidents during the work to arrive at the conclusion that maximum accidents occurs during which month; the below diagram shows the data after stratification:
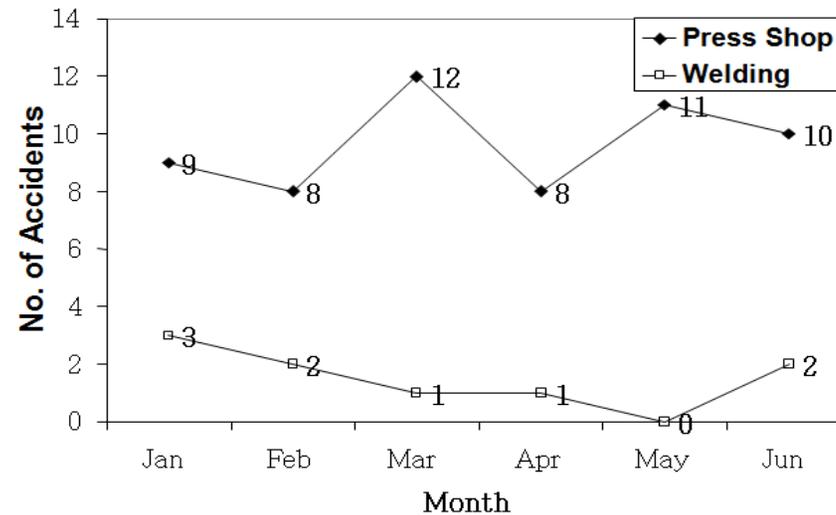

Other tool was Pareto Chart (Vital Few and Trivial Many) which is a diagram that shows the order of the largest number of occurrences by item or by classes and the cumulative sum total. He has mentioned about two famous scientists who used this method for quality management. Vilfredo Pareto (1848 – 1923), an Italian Economist discovered in 1897 that 80% of a nation's wealth was owned by 20% of the population. Dr. Joseph M. Juran applied this principle to Quality Management and called it 'The Pareto Principle'.
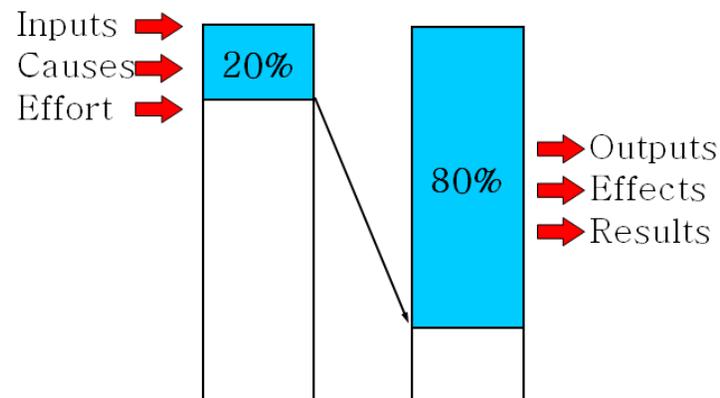
Another method explained by the speaker was cause and effect diagram which represents the meaningful relationship between the effect and its causes; it graphically explains all the possible causes related to the problem. It is one of the most powerful methods to identify the root causes not the symptoms of a particular problem; the structure of cause and effect diagram which is shown below. This diagram is also known as Fishbone Diagram. He also explained different types of cause and effect Diagram. They are:

Dispersion Analysis type
Process Flow Classification type
Cause – Enumeration type

Cause and Effect Diagram
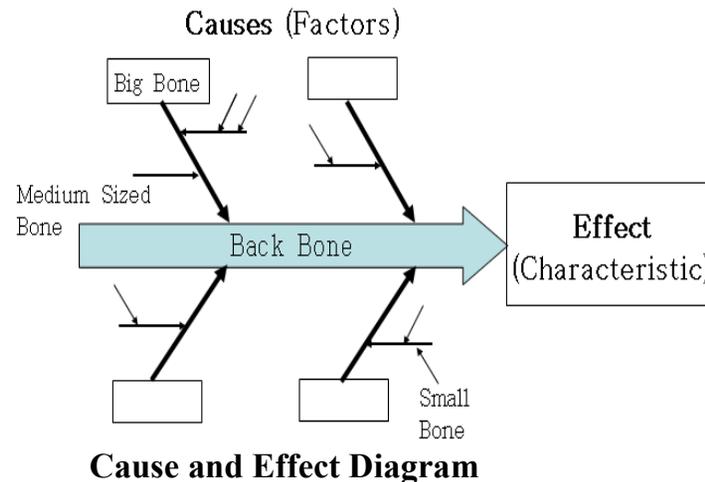
Followed with the second session on "Operations Research" and how Linear Programming Problem (LPP) and Queuing Theory and PERT/CPM are used in real time; major parameters to be considered in project management and how we have to handle risks in the industries by adopting alternating planning method. He strongly believed that project management is the application of knowledge, skills, tools and techniques to project activities in order to meet and exceed stakeholder needs and expectations from a project. It involves balancing competing demand among:

- Scope, Time, Cost and Quality
- Stakeholders' needs and expectations.
- Identified requirements (needs) and un-identified requirements (expectations)

He has considered different tasks in different organizations and did a comparative study; one such example of a project management was how the task has to be carried out and how it has to finish with in the given time period

and not exceeding the budget allotted for that project and how the performance can be analyzed by using this method.

```
┌──────────┐       ┌──────────┐       ┌──────────┐
│  DESIGN  │───────│  BUILD   │───────│ INSTALL &│
│          │       │          │       │   TEST   │
└──────────┘       └──────────┘       └──────────┘
```

WEEK

	TBC	1	2	3	4	5	6	7	8	9	10	11	12
DESIGN	24	4	4	8	8								
BUILD	60					8	8	12	12	10	10		
INSTALL & TEST	16											8	8
TOTAL	100	4	4	8	8	8	8	12	12	10	10	8	8
CUMULATIVE		4	8	16	24	32	40	52	64	74	84	92	100

Budgeted cost by period

When the actual expenditure is considered it has exceeded from what was allotted; by the end of 8 weeks the allotted cost was $54,000 but the actual cost came up to $68,000.

WEEK

	1	2	3	4	5	6	7	8	Total Spent
DESIGN	2	5	9	5	1				22
BUILD				2	8	10	14	12	46
INSTALL & TEST	-	-	-	-	-	-	-	-	0
TOTAL	2	5	9	7	9	10	14	12	68
CUMULATIVE	2	7	16	23	32	42	56	68	

To sum up with his study he underlined that how cost and effect method is beneficial to analyze the performance of an individual as well as the performance of a particular organization as a whole. The below given equation shows how to calculate CPI and the cost variance for a particular task:

$$Cost\ Performance\ Index = \frac{Cum.\ Earned\ Value}{Cum.\ Actual\ Cost}$$

$$\therefore CPI = \frac{CEV}{CAC} = \frac{54}{68} \times 100 = 79\%$$

Cost Variance   = CEV - CAC

= 54 x 1000 - 68 x 1000

= - 14000 $

It indicates that the value of work performed throughout 8 week is $14000 which is less than the amount actually spent. The Normal Distribution is the most powerful tool in statistics as how to improve the performance in banks by considering fixed deposits as the major parameter and regression analysis can be applied in corporate sector.

There was an interactive session between the speaker and the participants to clarify their doubts. The students got an opportunity to learn how to implement statistical tools in various IT sectors and how various assignment problems are applied in real time. The session ended with vote of thanks by Prof. Nirmala. S, Head of the Department, School of Computer Science, Sambhram Academy of Management Studies.

Epilogue

The computer science students studying theory in the class should know the practical aspects of it and this seminar facilitated them an opportunity to expose to the practical aspect of application of mathematics in computer science.