Session Title: **Statistical Applications in Business and Industry**

Speakers

Prof. P K Perumallu

Prof. Ashok Sarkar

Prof. Shreeranga Bhat

Prof. Vinayambika S Bhat

Decreasing the Variance of Product Safety Certification Turn Around Time

Prof. P K Perumallu

Abstract

Turnaround time plays a key role in customer satisfaction as well as the amount of business. Any reduction of this will mean many benefits to any organization. One such area has been addressed in this study.

Products come for safety certification to the laboratory. Laboratory internally have 17 activities, which include multiple processes, and number of reviews of the tests and test results, to complete the lab tests. Finally lab test report is sent to the customer. Total time taken for all these activities is the turnaround time. More turnaround time means less number of customers serviced, meaning less business to the laboratory. Hence the project is taken to reduce the turnaround time. Presently it was taking 28.3 days delay to complete the project from the committed time of completion (74days). After taking improvement actions the turnaround time is reduced to – committed time 54 days and delay of 1.38 days on an average.

Key Words: Turnaround time, cycle time, value added activities, non-value added activities.

Application of Lean Six Sigma in Healthcare

Shreeranga Bhat

Department of Mechanical Engineering, St Joseph Engineering College, Mangaluru, 575028, India

shreeranga1981@gmail.com

Abstract

The research intended to excavate the Lean Six Sigma (LSS) deployment challenges, Critical Success Factors (CSF), tools and techniques, and managerial implications in an Indian healthcare setting. It illustrates a case study established using Action Research (AR) approach. Further, the case study is based on the Define, Measure, Analyze, Improve, Control (DMAIC) phases of LSS. The performance and service quality of the Endodontics department of a dental college attached to a hospital is enhanced and sustained through the LSS strategy. The processing time of Root Canal treatment is reduced by determining the root causes for delay and implementing sustainable solutions.

Keywords: Lean Six Sigma, Dental Hospital, Endodontics Department, Dental Education, India

Taguchi Grey Approach in Designing Proportional Integral Derivative Controller

Vinayambika S Bhat

Department of Electronics & Communication Engineering,
Mangalore Institute of Technology & Engineering, Moodabidri, 574225, India,
vinayambika09@gmail.com

The research aims to apply a statistical approach for a robust design to determine the optimum levels of Proportional Integral (PI) controllers by considering the noise parameters in the control engineering arena. Taguchi's robust engineering methodology and Grey Relational Analysis (GRA) methodology are utilised for multi-objective optimisation of the process parameters. Taguchi method is effectively applied to ensure the robustness of the controller designed under the set range of model parameter uncertainties, which cause undesirable variation in the PI controller's performance. The ascertained optimal parameters from the Taguchi-Grey approach are subjected to simulation analysis to determine the settling time and performance indices. During the study, it is reconfirmed that statistical tools' application assists in developing a robust controller design in a structured manner. Moreover, it is observed that the approach helps in multi-objective optimisation by accommodating both control and noise parameters in the control system design.

***Keywords*:** Robust design; PI controller; Performance index; Taguchi method; Grey relational analysis; Simulation; Multi-objective optimisation; Noise parameters; Servo response; Regulatory response; First-Order-Plus-Time-Delay