Summary report on seminar titled "Digital Solutions for the Process Industries" held on 16-March-2019 in IIT Bombay.

The first technical session had five presentations from eminent speakers. The session was chaired by Dr.M.P.Jain & co-chaired by Mr. Praveen Saxena. The sessions started with introduction of each speaker. Each talk was concluded with Question & Answer session from audience followed by vote of thanks.

Prof. Mani Bhushan talked about Data Reconciliation as a Tool to Enhance and Monitor Performance of a Sensor Network. The measurements in any process are usually corrupted with noise. Additionally, sometimes sensors may become faulty and not give the correct reading. Often, a model relating the quantities to be measured, is known either form first principles or can be extracted from historical data. Optimal combination of model prediction and measured data can give much more accurate estimates of the true values of process variables which can be used for process monitoring, control etc. Data reconciliation is a technique that can be used to efficiently integrate prior process model with real measured data. It can be used to improve the accuracy of measurements as well as identify faulty sensors.

Dr. Sunil Shah talked about Digital twins, refers to digital replica of physical assets of process, people, places, systems and devices that can be used for various purposes. The digital representation provides both the elements and dynamics of how an Internet of Things device operates and lives throughout its life cycle. Also, the changes occurred in past the decade were discussed to establish the pole position for modelling and simulation, the digital twins.

The silent features of the talk given by Dr. Shrikant Bhat includes: IoT and AI are two important focus areas of digitalization. The former is related to smart sensing and communication, while the latter relates to value-addition. The presentation touches upon various aspects related to AI engineering, standardization, challenges in implementation and future R &D opportunities.

Mr. Deepak Seth talked about increased coverage of various optimization offerings at equipment level, unit level or plant level. Data analytics are some of the tolls and services that are offered that come under the broad umbrella of optimization. All of them promise better utilization of asset. This scope and limitation was discussed with case studies in the presentation.

Dr. Shubhadarshinee Sahoo talked about process realibility advisor that includes process models and fault models that have been developed with technical service, engineering and R & D experts. The solution provides early detection of process issues and includes trouble shooting recommendations to resolve issues before it becomes a costly affair. Process Optimization Advisor maximizes profits from the unit or complex using current economic conditions.

The second technical session was chaired by Prof. V. K. Srivastava & co-chaired by Dr. Anita Kumari.

Ms.Priya Bhagwat spoke about challenges & efforts made to curb costs & scale back on new project development. She explained how steps towards Industrial Revolution 4.0 can cut down inventory, downtime, logistics and storage costs besides mentioning the use of information technology to automate applications that enhance productivity.

Prof. Kannan Moudgalya, spoke about the use & scope of the Free /Libre and Open Source Software like DWSIM which is suitable for chemical process simulation, creation of flow sheets of various chemical processes.

Mr. Sharad Joshi highlighted on opportunities for digitalization along the entire value chain in all businesses and functions in chemical industry.

Mr. Punit Krishna, talked on digital era a new way of doing business. He explained in detail the benefits of digital platform model over the traditional pipeline business model.

The panel discussion was held on topic Digital Solutions in Process Industries-- Opportunities and Challenges

The Chairman, Mr. Sushil Kumar introduced himself and other Panel Members that includes Prof. K P Madhavan, Mr. Joy Shah, Mr. Rakesh Mehra and Mr. Ashish Dwivedi.

The views expressed are summarised below:

Digital solutions and digitisation has been in practice in process industries for a long time, however the present technology in digitalisation has brought a big change in process industries. With more and more solutions coming from digital revolution the process industries have reaped benefits like lower cost of production, better quality of products and safer operation. Availability of low cost IIoT , increase in computation speed , data analytics, cloud sourcing, ease in availability of mobile technology, and increased connectivity will further accelerate its adoption in process industries in India. Process industries are at the door step of digital revolution by aligning people, process and technology. Smart manufacturing is by convergence of sensors, connecting assets and real time prescriptive analytics. The opportunities of smart manufacturing are limitless. This results in improving decision making process. Digitization is now getting applied in high hazard industries and giving good results in terms of better compliance, improved standardization, reducing failures, and achieving operational excellence. No opportunities are without challenges and digital transformation journey in process industries is just beginning and has to face and overcome the challenges. Some of the challenges are lack of specific information, limited manpower with relevant experience and budget constraints. It is a matter of satisfaction that there are solutions and steadily though slowly the engineers are making this journey of digital transformation. All panel members gave few examples for better understanding. The session was concluded with lot of hopes to move on the path of digital revolution in process industries for safe operation.

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