

Optimizing efficiency through digitalization in chemicals, petrochemicals and refining
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1. Please introduce your role at HPCL-Mittal Energy Ltd

My role is the General Manager Reliability and Maintenance) maintenance and reliability). Heading the Reliability, Maintenance and turnaround sections of the Oil Refinery in northern part of India, HPCL- Mittal Emergency Limited.
I am lead of company's transformation to Digitalization.

2. What does the subject of digital transformation and IoT mean to you?

Transformation is part of industrial internet of things where objective is integration of all the available data , processes, apply big data analytics and AI to the integrated data to drive big benefits in terms of reliability, availability and productivity.

3. What's the greatest impact IoT, data analytics and AI will have on the industry? What lies ahead of operators and how will they adapt?

In oil and gas sector, there is scope for more control to the increasing assets and hence data, we require technology that will support analysing big data, predict using AI and helps us planning ahead including daily jobs and TA jobs cycles

4. How do you see the role of the Industrial Internet of Things in refining, petrochemicals & chemicals? What are the key benefits and opportunities of using IIoT solutions in downstream operations?

IIoT has a big role to play in downstream industries in managing plant operations starting from supply chain till refinery operation and maintenance functions. The management of the assets/operations to be done in a way so as to optimise the resources and gain more control over refinery management for sustained and better reliability, availability and productivity.

5. How will this paradigm shift affect talent in manufacturing & downstream industry overall?

All the industries are moving towards automation rather than manual activities to achieve quality, reliability and safety. IT has become integral part of almost all the engineering tools. New talents in industry are able to learn and implement maintenance and operation practices faster with the help of technologies and internet. Overall the trend is good but at the same time equal importance must be given to the fields' activities and process must be introduced to help and highlight talents working on the fields.

6. What does workplace innovation look like at your organization?

HMEL is a growing organization with strong intent towards passionate innovation. HMEL journey of past 5 years has been remarkable and introduced several digital technologies towards improvisation. Vibration monitoring offline and online, lube oil analysis lab, Taproot for RCA, wireless vibration meters, AP networks for TA planning, SAP for work management, Lloyds for Asset integrity and now APM for overall management of assets are some of the moves towards innovation.

7. How does this impact your customers?

Based on continuous improvement and quantifying HMEL performance. Availability and reliability of the refinery has always been in increasing trends with few hiccups in between. Our product dispatch has been steady and well planned. Shutdowns and product dispatch are planned way ahead and incident of unplanned production loss has been few.

8. What are the latest technology adoptions by downstream operators in Asia? Are there any success stories that other operators can learn from?

Latest technologies such as wireless vibration transmission, drones inspection, pattern analysis of equipment parameters for advanced analytics, usage of hand held electronic device in fields are few of the technologies adopted by industries with very good results.

9. What Does Industries 4.0 mean for your company?

HMEL is working with full pace towards industry 4.0 digital transformation. Most of the process are automated to extract maximum value such as RCM, FMEA, RCA, LLFS, Vibration monitoring, anomaly alert, work management. Also there are digital platform for MOC, PSM, IIF processes etc. There are still scope for improvement for further automation and HMEL is ready to adopt to attain better and safe future.

10. Will Artificial Intelligence replace humans working in oil and gas?

Artificial intelligence shall be of great help for oil and gas industries. As more manpower is again a major hazards for refinery, there are several people working on excel sheets for data extraction and management to take care for daily job planning and resources management. Intelligence and automation can bring lot of changes if properly implemented. In the long run, definitely by automation, man power shall become more productive and better utilized for further enhancements. Hence manpower won't be replaced.

11. What is the current state of cyber security preparedness across refining, petrochemicals and chemicals and how is the cybersecurity market set to evolve?

Cyber security is very important in today's arena. With the increasing assets and data, refineries are vulnerable to internet as access of whole data becomes easy through internet. Industries has opted for several tools for securing mails, servers, accessing data through USBs, catching company document transfers. But with increasing data complexity there is ever increasing demand for evolution.

11. Are manufacturers concerned about cybersecurity in their organization?

Manufacturers are definitely concerned about securing their knowledge, procedures, data as introduction of virus can result in disturbing refinery operation. Manufacturers are developing strong base towards improvement in IT infrastructure and network security. The better the system security is in place, the better the organization confidence towards operation.

12. What are the key technologies which your company would like to implement in the next 5 years? (for refiners, petrochemical & chemicals companies only)

Wireless technologies for remote equipment vibration monitoring.

IIOT : steam trap management , pressure control valves on line monitoring.

Early detection of process risk in critical process issues.

Predictive analysis.

Virtual analysis.

Machine learning.

-Advanced equipment inspection using drones and improved cameras

-New technologies: digital twins, smart signal

13. What are the current challenges and hurdles that affect the spread and deployment of the Internet of Things in your organization? (for refiners, petrochemical & chemicals companies only)

Current challenges:

1. There are numerous technologies in the world but it is hard to integrate all of them to maximize value of digital transformation.
2. Data is very important for creating automatic intelligence and with so many processes in place, it is getting difficult to maintain data discipline.
3. Pay back for investment is not yet proven.
4. Sensors and Digital technologies are very costly, maintenance of these technologies becomes a burden in future.
5. We do not find service providers who have in-depth knowledge of the process or equipment.

AI can be imbedded in the system in a better way when the people who are involved in the evolution process are fully aware about ground realities and requirement by end user.

14. What impact does Big Data have on operational efficiency and how is Big Data changing the industry?

With increase in assets, refinery has so much digital data of equipment parameters, operations, work management. Proper implementation of big data analytics can be really helpful for new as well as experienced professionals for guidance, planning, alerting, and alarming, managing resources. With big data operational efficiency can be improvised in all these areas.

15. What are your views on Asia's downstream industries rate of digitalization as compared to counterparts in other regions i.e. America, Europe and the Middle east markets?

Asia is slowly and steadily moving towards digitalization. Due to availability of manpower, driving automation and processes with less value has been difficult in Asia rather than their counter part in America or Europe. But industries have adopted technologies very fast wherever risk is very high for example business equipment/processes - machine online vibration monitoring, SAP for work management, online analysers and inspections etc. With fast infusion of internet in Asia and industry, there is lot of hope for further digitalization and automated controls.

16. With these radical changes looming what opportunities lie ahead for manufacturers?

There are several opportunities for transformation but the biggest challenges is that the technology is itself in nascent stage. There are several technologies available to bring down failure costs and unplanned shutdowns using predictive maintenance techniques but integration of these technologies to bring about better outcome is still under preliminary stage. Opportunities for transformation of business process is a way ahead but there not yet a good proven system with great performance record which contain all the refinery process to gain better control.

17. What will the future workforce look like in the digital age?



- Workforce will have knowledge of data mining and analytics.
- Shall be more focused and have wisdom.
- Shall be more creative and innovative

