

IDENTIFY, CREATE AND DEPLOY VALUE WITH MANUFACTURING EXCELLENCE AND CHEMICAL 4.0 SOLUTIONS

With the right combination of skill sets, partner ecosystem, and business models, Tridiagonal Solutions supports companies in providing Industry/Chemical 4.0 solutions.



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? How can chemical and petrochemical companies leverage Industry 4.0/digital solutions to increase their profitability?

The digital economy is expanding. The availability of digital technology and its application will enable the data-driven decisions across the board. The organization's digital capability shall help in stabilising operations and control the desired throughputs by using Advanced Process Control (APC). The role-based visibility of plant and enterprise-wide intelligence using data science/analytics will increase competitiveness, decrease costs, and improve productivity. With the right cultural transformation agents (internal/external), implementing Industry/Chemical 4.0 such as data infrastructure, APC, APM, supply chain analytics, etc. can be leveraged for sustainable and profitable operations.

? Would you brief us about Consulting Solutions and how will it be beneficial for chemical and petrochemical companies?

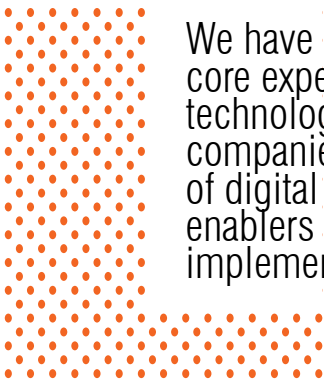
Today, chemical and petrochemical

companies are on the cusp of digital transformation. There are multiple challenges in making this transition happen, such as digital maturity or readiness, right road map, selection of right technologies stack, cultural transformation, upskilling, etc. Tridiagonal Solutions play the owner's consultant role to identify, create and deploy value in a digital transformation journey of the customers. Our core competence is to leverage our deep process understanding and focus on successful implementation of the Industry/Chemical 4.0 technologies.

We undertake digital transformation roadmap preparation focusing on manufacturing operations. It starts with gap identification (processes/IT-OT), defining key pain areas, mitigation actions, digital capabilities to be developed and solutions/tech stack to be deployed. With the right combination of skill sets, partner ecosystem, and business models, we support companies in providing Industry/Chemical 4.0 solutions. It involves data historians, Advanced Process Control (APC), Asset Performance Management (APM), Operator Training Simulation (OTS), asset integrity, data science and analytics for manufacturing intelligence, remote monitoring, etc.

? What are Tridiagonal's offering to petrochemical, hydrogen and gas companies? What's your USP?

Since its inception, Tridiagonal Solutions has been playing key role of a catalyst to test new technology, optimize existing processes/assets in the chemical, petchem and energy sectors. As the first incubation company of National Chemical Laboratory (NCL), a constituent member of the Council



We have been investing in building the core expertise – breadth, depth and latest technologies. The chemical/petchem companies in India are at an early stage of digital transformation journey and need enablers to initiate, prove and scale the implementation of digital technologies.

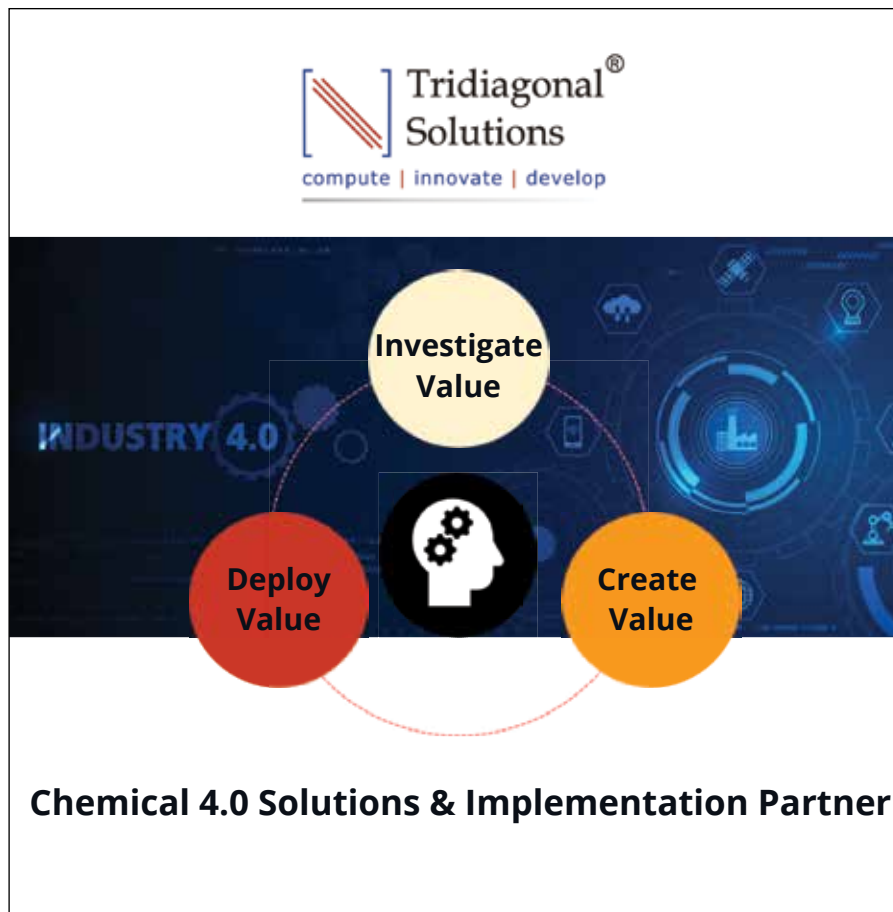
of Scientific & Industrial Research India, we have been leveraging a combination of technologies to support various R&D, operations, digital transformation initiatives of chemical, petchem and oil & energy industry. For e.g. model-based engineering to study various phenomenon's (combustion, separation, mixing, drying, etc.) physical/digital validation, hybrid modelling, advanced process control, data analytics, etc. We have delivered more than 1,000+ projects in various domains, viz, process/energy optimization studies, debottlenecking, scale-up & tech transfer, batch to continuous, Advanced Process Control (APC), Asset performance management (APM), digital twin, data science/analytics, etc. We have been continuously evaluating new technologies such as CO2 capture, green hydrogen, etc. and have developed the collaboration ecosystem of R&D establishments, research institutes, technology providers, etc. Our vision is to shortlist the Tridiagonal technologies and evaluate and adapt it to Indian requirements and scale it.

? **Tridiagonal has tied up with companies like Siemens, Honeywell, Seeq, Factsage and Vidya. How will this help Tridiagonal in providing 360-degree solutions to its clients?**

The technology companies have put in huge efforts in the last two decades to develop solutions using the latest tech stack such as Industry 4.0, Web 4.0, data computing & integration, cyber security, etc. The customers on the other hand get lost in buy versus build decisions, or spend time in evaluating multiple solutions/vendors without validating the business requirements.

For a successful digital transformation, one needs the tech stack that meets business requirements. It should be embraceable by different stakeholders (not just skilled resources) and easily scalable. We have built a strong partner eco-system of leading technology providers, for e.g. companies such as Seeq, Honeywell, Vidya, Factsage, etc., which meets these success criteria and provides 360-degree solutions to the customers. The solution covers Chemical 4.0 - vertical and horizontal integration, L0 to L4 & above, digital twin, etc.

We at Tridiagonal Solutions specialize in application and implementation of these technologies/solutions and create business value for our customers.



? **How do you see Tridiagonal Solutions playing a role in digital transformation projects in the Indian chemical industry?**

Tridiagonal Solutions have evolved as a technology company in the last two decades and have been consistently creating value for our global (Fortune 100, 500) customers. We have been investing in building the core expertise – breadth, depth and latest technologies. The chemical/petchem companies in India are at an early stage of digital transformation journey and need enablers to initiate, prove and scale the implementation of digital technologies. We play this enabler role with a focus on application of Industry 4.0 technologies (APC, APM, digital twin, data science & analytics, etc.) along with the combination of skill sets and partner ecosystem.

? **The company has one of the world's largest multiphase flow laboratories for serving the oil & gas industry. How does this lab help oil & gas companies?**

In order to maintain the sustainable operations of E&P companies, the companies invest huge capital in enhancing the recovery of oil & gas post commissioning and operate in the set limitations. They ignore the need for production enhancement studies, flow assurance qualification tests or proof of concept tests of new technologies. It is essential to do such pre-commissioning studies and generate production enhancement/ optimization data to ensure the E&P fields operate with the right operational matrix and take informed decisions. The reason E&P companies in India fail to do such pre-commissioning qualification is due to lack of field scale infrastructure and R&D testing set-up, which can mimic the actual field conditions. We operate one of the largest field-scale flow testing facilities in India, and have been supporting global oil & gas majors like Chevron, BP, Shell, Deepstar consortium, etc. We have some unique assets here for wax deposition, erosion, corrosion and complex multiphase flow testing. ■