

INTELLIGENT TRADING PLATFORMS FOR REFINERIES & PETROCHEMICALS

WHITEPAPER



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Introduction

In the January of 2020, the world was struck by novel coronavirus. It spread like a wildfire across the world, given its contagious nature. To contain the spread government's restricted the movement. Consequently, the global fuel demand reduced significantly. The sudden drop in demand made the crude markets oversupplied and sent the crude prices in downward spiral. The world witnessed first time in history, on April 20th, 2020 negative prices. US oil benchmark West Texas Intermediate (WTI) fell from \$17.85 at the start of the trading day to negative \$37.63 during the trading hours.

Dwindling demand for the most of 2020, for end products such as Gasoline, Diesel & Jet Fuel forced refiners to shutdown plants permanently. The refining capacity which was permanently shutdown in the US alone was nearly 2.6 million barrels per day. As per market report in November, Marathon Petroleum, the largest U.S. refiner by volume, planned to permanently halt processing at refineries in Martinez, California, and Gallup, New Mexico. Plants all across the world were headed for permanent shutdowns and many of them reopening as terminals.

As per the estimates, 1.4 million barrels per day, about 9%, of refining capacity in Europe is at risk of shut-downs by 2022-2023. The refineries that have survived have a built-in flexibility to alter the yields and maximize the products that were still in demand. The built-in flexibility, means capacity to run different grades of crude and to manufacture products apart from transportation fuels such as petrochemicals and special chemicals.

Rebuilding strategies:

The pandemic not only forced numerous oil and gas companies to file for bankruptcy, but also made all the Oil Supermajors to rethink their business strategy as their stocks hit 25-year low. The impact of Covid-19 on jet fuel consumption will be felt until 2026, when demand will return to 2019 levels. Downstream companies will have to not only deal with issues of lower demand and higher uncertainty but also with reduced margins and skewed product slates. .

To sustain and adapt to the current situation all the O&G companies need to leverage digital technologies to innovate. In the challenging times that lie ahead for oil and gas sector, players in order to remain profitable need to:

1

Decrease costs to stay competitive:

Producing crude oil and refined products at a reduced cost is one of the sector's biggest challenges. Therefore, the foremost priority should be to improve the production systems and environmental utilities on the operating sites. This will increase production efficiency, decrease costs and enable the upstream companies to pay for the exploration costs.

2

Enhancing performance to guarantee

the valorization of assets: Presently, most oil companies seek to prolong the life of mature sites to maintain the supply of crude oil or gas. However, they are also forced to find new sources for which extraction, transport, and refining might be costly and complicated. To achieve that, they need to have 100% dependability, i.e., no unintended shutdowns, increased utilization & production rate, and prolong the life of assets.

Challenges for Traders

Trading in such dynamic situations presents its own challenges. Traders working for refineries have more complexity to deal with in comparison to traders working for commodity trading companies. Refinery Traders have to work with multiple inputs like plant availability, vessel availability, crude inventory plan, grade mix requirements, freight price inputs, indifference rankings, etc., before making a trade in the market

Trading applications consider only the business process related to both trading and financial inputs and executions. However, they miss some critical inputs that enable the decision making requirements of the refinery traders such as:

- 1 Crude Indifference report from Refinery LP planning team for information on various crude grades volumes and prices to be procured,
- 2 Crude Inventory plan with the scheduling team to determine the delivery sequences for each grade of crude to be delivered,
- 3 Freight cost for different types of vessels for each region

- 4 Market prices and news from Platts, Bloomberg, etc. news agencies
- 5 Financial statements on each counter party and their trading limits
- 6 Refinery Operational status report
- 7 Historical deal analysis & Hedging cost reports

With each trade, trade value varying 40-100 million USD worth depending on the volume and market prices. Traders have a vast amount of data to be processed before taking the decision and also needs to provide the deal justification to management for approvals. As the information flows to the trader from multiple sources, he always has the risk of inaccurate data or mismatched data. Sometimes partial data is available, especially when he is evaluating distressed cargos. Most traders perform scenario analysis by making calculation with in excel sheets, rather than IT enabled tools.



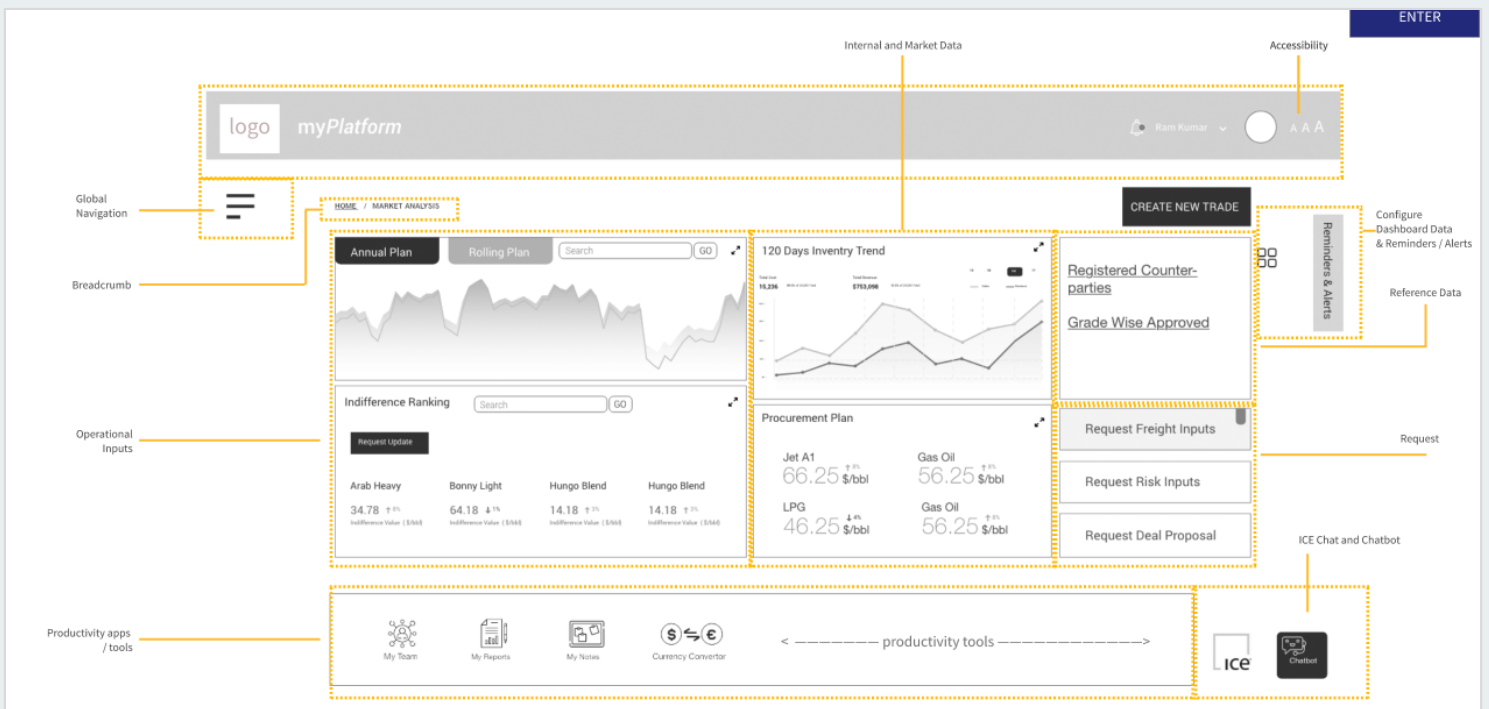
Intelligent Trading Platform

Intelligent Trading Platform is designed to bring a one-stop-shop for all data requirements for Refinery (& Petrochemicals) traders. The platform brings many digital solutions under the single platform to support the traders for their daily needs, bring up speed, remove repetitive manual activities, and augment the trader's market visibility with AI-enabled solutions.

Some of these features are listed below

- 1 Data integrated from multiple systems, ensuring synchronized data is visible across all systems
- 2 Providing the Traders with tabs for market analysis daily, save their calculations templates, which can be automatically run using RPA's,
- 3 Triggering the Crude procurement process from within the platform via the business process managed (BPM tools) on the forum, ensuring all inputs and analysis are recorded for deal approvals

- 4 Synchronization with chats from Trading platforms and secure calls with other traders providing AI lead Speech Analytics during the trading calls, providing inputs to support negotiations
- 5 Forecasting Crude prices with Neural Networks containing Multivariable Inputs from Technical Analysis for each region to support the trader decision making process
- 6 The cloud-based platform ensures the availability via various secure mobility devices, ensuring traders have all data handy
- 7 Dashboard for a status report on all deals in different stages of execution and detail reports with analytics for contracts that have been executed readily available for reporting & decision making



Conclusion

An intelligent platform will reduce the trading team's efforts and bring across clear visibility of all information relevant for decision making. A change of 0.1 \$ / bbl cost will improve the company's margin by 13.2 million (refinery of 400 Kbbbls/ day). The platform is extendable for crude traders and can be extended for product traders, hedging desks, and Ship Chartering desks, thereby improving the refinery's overall margins.

TechM provides services for more than 15+ years across the Oil & Gas value chain. Our subject matter experts are hired from industry who provide deep domain expertise in Upstream Production, Supply Chain Management & Logistics, Operations, HSE and maintenance backgrounds with technology knowledge and implementation experience. TechM O&G has put up this Platform offering for Trading in Crude and Feedstock for Oil companies to ensure that latest technologies help the organization bring in agility and improve the margins. TechM brings in team of SME's in Crude Trading to ensure that all business process is well defined and captured in the Smart Trading Platforms.

Authors

Bhargav Chandarana brings in 16+ years of experience in Refineries, Petrochemicals and Consulting Companies. Bhargav experience spans in areas of Management consulting, Project Management, O&G Supply chain optimization, LNG Delivery Optimization, Shipping and Refinery Operations. Bhargav has been delivered multimillion-dollar refinery commercial optimization project and worked for designing digital roadmap for a new petrochemical complex to name some of his recent works. He has designed Integrated Manufacturing Operations Management systems for Refining & LNG business and designed automated backcasting tools for refinery planning. Bhargav holds a Bachelor of Chemical Engineering.

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