

Effective Trading

Infrastructure model for power exchanges

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Trading has been taking place almost ever since man evolved on this planet. In the past 150 years, there has been a continuous evolution in the techniques of trading, accompanied by the creation and improvement of technology. Though some of the discoveries have taken place by accident, most are a result of decades of research and continuous involvement.

Next steps in trading

Though trading in India has been developing over centuries, a major breakthrough came in 1875 in the form of the creation of a platform to trade – the Bombay Stock Exchange (BSE). The BSE enjoyed a virtual monopoly till the Harshad Mehta scam in 1992, which led to a widespread scare in the financial sector. Realising that the scam had been possible due to the lack of control and inadequate processes and systems, the need was felt for a foolproof system

which would eradicate the problems from the root, create a secure system to instil confidence amongst all investors, and have an entity controlling all the activities with no interest in what or how much is being transacted.

This led to the formation of the online National Stock Exchange (NSE) in 1992, demutualised at birth. Not surprisingly, the BSE went online within a year of the NSE beginning its operations in 1994. However, the BSE was demutualised only in 2007. Both these exchanges are well regarded globally and are amongst the largest in the world.

A modern power exchange is a completely wire-driven, electronic exchange including the following players and systems:

Buyer

The buyer is one who places a request to

procure electricity. The buyer would be considered as a member of the exchange after completing the necessary compliance and legal requirements. In an electricity market, the buyer would be a power distribution or a power trading company, which sells electricity after buying it through the power exchange. The buyer would connect to the power exchange using a data link. This could be done either through a private leased line or an internet leased line platform secured for trading, as is allowed by the power exchange.

Seller

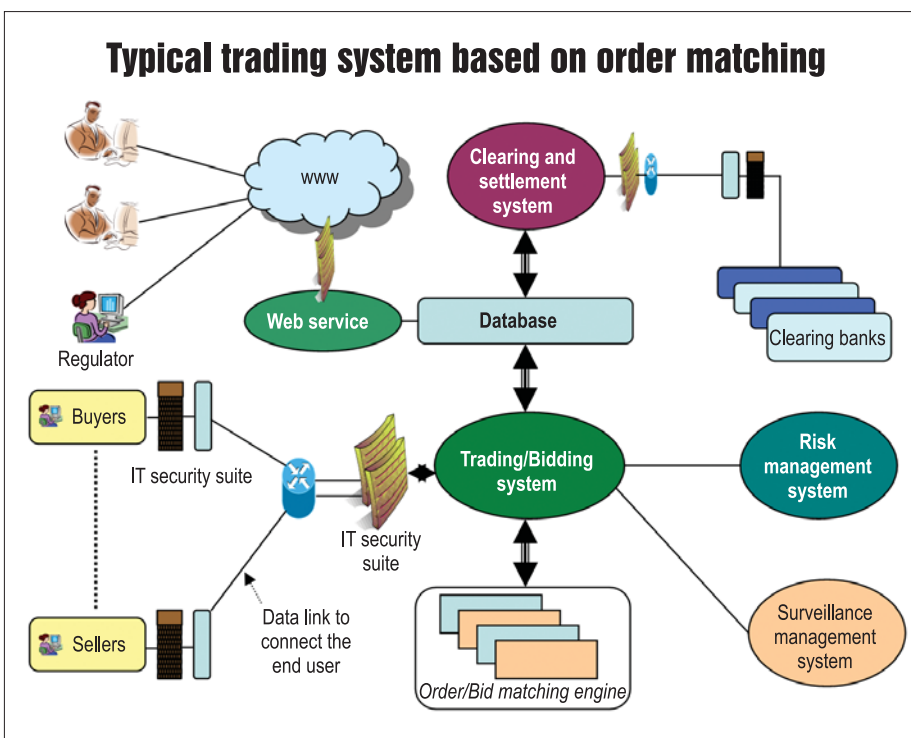
A seller is one who places a request to the exchange to sell electricity. Like a buyer, the seller would also need to comply with all the requirements. The seller would be a power generating company such as a merchant power plant or a state utility selling surplus power. The seller would connect to the power exchange satisfying the connectivity and IT security norms as stipulated by the exchange.

Regulator

The regulator would perform its role by understanding the country's markets and amending the regulations in the interest of the users. It would regulate tariffs, set standards for grid control by grid operators, and continually look for improvements in power market operations by keeping a vigil on every entity in the power market. This would also involve the grid operator (also the apex body managing the power grid) setting practices for healthy and stable operation of the national grid.

Trading/Bidding platform

The trading/bidding platform would provide a neutral platform to receive the orders/bids from each buyer and seller,



match the bids for determining the best price, and the corresponding quantity/volume at the best prices. For a power exchange, the bids would be matched based on the price, volume and time priority of the bid. The matching engine would run an algorithm devised for the country's power markets to derive schedules to be cleared. The clearing of these schedules would be done by the grid operator and communicated to the respective buyers and sellers during the defined time slots. The matched trades would then be stored in the database for long-term storage.

Risk management system

A risk management system would manage the day-to-day financial risks on the trading system. In a power exchange, the risk has to be managed between the buyers and the sellers. The system would entail seeking operating margins and online clearing of funds, pay-in from buyers and pay-out to sellers online through clearing banks authorised to operate with the power exchange. The risk management system would ensure that there are no payment defaults and that buying and selling are conducted smoothly on the exchange.

Surveillance system

A surveillance system would keep a close watch on the transactions. In a power exchange, the surveillance system would monitor the bids, the changes in the bids before being cleared, the cleared volumes, and the correlation between the bids, volumes and the cleared schedules.

Clearing and settlement system

The clearing and settlement system would manage the margin deposits and payment schedules for the sellers as well as the receipt of funds from the buyers. The buyers and sellers would need to open settlement accounts with the stipulated clearing banks. The required pay-in from the buyers would be done through these settlement accounts, and the sellers then paid based on the cleared sale. This system would also need to provide the necessary regulatory payments such as grid operator charges,

transmission charges and any other receivables from the buyers and sellers on the power exchange.

Website/Media interface

Being a participant in the system, an entity would need to receive reports from the system directly. Moreover, other entities would also require to study the details of the transactions. Hence, a website is an ideal way of providing the information to all parties who need to observe the market's movements. Transaction details such as the cleared price and volumes throughout the contract can be accessed by anyone by logging on to the website. Historical data would be also available for scheduling and load prediction.

The role of IT

Using IT, an end user such as a member of the exchange or a power trader can be instantly connected to the exchange's trading/bidding system. The bidder can determine the schedule required for injection or withdrawal of power, and can plan his bids accordingly. The bidding pattern would be available, which would remain a useful tool to plan the schedules effectively. Historical data would be available at any time.

Using secure sessions and multiple authentication levels for users, data transferred between the trading system and the end-user will remain intact and anonymous for any other user. The anonymity of bids is retained by a system-driven approach. At the exchange, the core of the trading system is the electronic matching engine of bids, which

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works out the provisional schedules and determines the final despatch quantities for the buyers and sellers. The trade matching is initially done by the exchange and then sent for confirmation to the National Load Despatch Centre, the apex body controlling grid operations in the country. Based on the final schedule, reports on the volumes and prices worked out by the electronic matching engine and confirmed by the grid and system operators are immediately made available to each bidder.

Accurate reports would provide the payment obligations and margins utilised/available to each bidder. The risk management system would not allow a transaction unless necessary and sufficient margins are available from the bidders. A clearing and settlement system would lead to efficient and accurate transactions and transfer of funds between the buyers, sellers and the exchange. This would also include all payments due by the exchange to the grid operator. The bank interface would allow for the immediate transfer of money via RTGS/NEFT.

Another key feature of a modern power exchange is the flexibility of an electronic system to adapt to the needs in terms of products and services, and maximise despatch, electricity being a national resource. IT systems thus play a key anchor role in improving the efficiency of a power exchange apart from meeting its business requirements.

Conclusion

Power Exchange India Limited (PXIL) believes that the Indian power markets are different from the global power markets and are still evolving. The infrastructure model for any power exchange would continue to evolve with the market's needs. Though the operating model would basically remain the same, new challenges would have to be handled by power exchanges, as a result of which customisation would be necessary. PXIL has ensured the scalability and robustness of its exchange infrastructure to cater to the needs of the Indian power sector. ■