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**Manufacturing IT Blueprint and Road Map for a large aluminium plant**



## Case viewpoint:

**Background:** A leading producer of aluminium in the world –is presently engaged, among many of its ongoing projects, in re-locating the aluminium rolling mills of the Novelis, Rogerstone in UK to Hirakud, Orissa in India. When completed, the plant will have a capacity of 510,000 Tonnes per year focusing on ‘can body’ sheets and coils of very light gauge. The plant will produce hot and cold rolled sheets and coils from the ingots drawn from the plant’s own smelting unit situated about a couple of kilometers away.

The aluminium plant had drawn ambitious plans to create a state-of-art IT infrastructure comprising of a Data Centre, a Server Farm and a Communication Network with a view to support an ERP & MES driven Enterprise Business System for plant operations. The objective was to develop an IT backbone for the plant; integrating the lower level process automation systems with the higher level Oracle EBS based ERP through a layer of Manufacturing Execution System.

**Role:** DBTC provided a comprehensive consultancy to the company in helping set up the integrated IT infrastructure. With its expertise in the metals industry and domain knowledge in IT and IT driven ERP and MES solutions it developed an enterprise wide IT blueprint integrating the “shopfloor to the top-floor”

**Scope:** The scope of work involves the full spectrum of activities in so far as Information Technology in Manufacturing is concerned. This includes –

**ERP:** Oracle EBS (Version 12) is recommended to be implemented in all its business processes like Finance & Costing, Materials & Stores, Production Planning & Scheduling, Quality and Human Resource functions. Oracle Advanced Supply Chain Planning (ASCP) will have a unique feature of Oracle EBS implementation. Manufacturing Operation Centre (MOC) of Oracle will be the other innovative solution recommended for implementation. The MOC will play a key role in evolving the desired information backbone of the company as a whole. The Oracle EBS will be networked and effectively interfaced wherever necessary with company’s implementation strategy especially in the Finance and Sales & Distribution modules where data will be shared with the remote servers on real time basis.

**MES:** Manufacturing Execution System in full measure as per ISA 95 and MESA guidelines has been proposed to be implemented in the plant’s Hot & Cold Rolling Mill complexes. It will be the first installation of its kind in a major aluminium plant in India. Emphasizing on Production Scheduling, MES will be implemented in Performance Measurement, Genealogy & Material tracking, Resource optimization, yard management etc.



**Data Centre:** Design of state-of-art Data Centres, one primary and the other secondary, complete with advanced Building Management Systems like the Precision Air Conditioners, UPS with redundancies, Security with Camera and Biometrics etc. The Data Centres will house the Server Farm and function as the Communication Hub too. The primary Data Centre layout is about 100 Sq Meters in area.

**Sever Farm:** Design of a unique array of servers to support Oracle EBS, MES and legacy applications in an integrated environment. Servers systems will support ERP and MES applications with a common storage and back-up infrastructure. The systems will function in a 3-tier architecture comprising of Data Base servers at the back end, Applications servers at the middle and the Web Servers at the front end. Server technology will explore and exploit the best of the processors, blade and rack based solutions.

**Network:** The plant wide network is built on a 3-Tiered Architecture with Core, Distribution & Access layers as per the best practices of networking. The active and passive parts of the Network are built keeping in view High Availability with redundancy of devices, ports and paths. There are multiple levels of Security in the network covering the Perimeter, DMZ, Internal LAN, Server Farm, Intranet which are achieved through devices like UTM, Firewall, IPS, HIPS/NIPS, End point protection & AAA. The network can support data and video in converged mode simultaneously. The network designed by DBTC/MND and proposed is a highly scalable, manageable, rugged & resilient network with almost no single point of failure.

The IT Road Map proposed by DBTC incorporated a number of innovative features like implementation of MES, version 12 of Oracle EBS with ASCP & MOC, severs with advanced blade technology, high availability with Oracle RAC & ODG for business continuity, clustered solutions of the databases, network with load balancers, security and virtualization etc. all of which call for domain knowledge in IT of very high order and precision.

The biggest challenge however is the integration of MES with ERP at the business and operational level. Keeping in view the pre-eminent role the ERP-MES combination, considerable emphasis has been given in the recommendations on how the 'duo' would be designed, developed, configured, implemented and integrated in the plant's complex and challenging environment. The IT blueprint envisions an ROI of over 35% for the company.