CASE STUDY ON THE EFFECT OF DIGITALISATION OF CAPTAIN STEEL INDIA LTD.

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Abstract

Captain Steel India Ltd. is one of the giants in the steel industry in East India, it has recently digitalised all its processes. This document shall analyse the benefits that captain steel has enjoyed due to its digitalisation. Along with this it shall also project the challenges faced by the company to do so and how these challenges have been overcome by the company.

Introduction

Captain Steel is a well-known manufacturer of Steel TMT Re-bars in Eastern Part of India. Captain Steel has two manufacturing plants in Asansol (West Bengal) and Bihta (Bihar). The company has been operating since 2007 and has an annual manufacturing capacity of half a million Metric Tonnes of Steel TMT Re-bars.

Value Chain

The firm procures basic raw materials like sponge iron, pig iron, iron pellets from the primary producers. The raw materials are processed in the Steel Melting Shop to make steel and then the steel is cast into billets. These billets are rolled into TMT re-bars using Thermax process. The finished products are sold to end-customers via a network of dealers and associate dealers. The dealers are the direct customers for Captain Steel. Customer demand for the TMT steel rebars is generated by use of advertising, celebrity endorsements and by providing incentives to the sales influencers like engineers and masons who help put word out into the market by using their influence on the decisions of customers.

Strategic Roadmap for Digitisation at Captain Steel

This analysis will look at 4 key areas in the digitalisation process of Captain Steel

A : Production Costing

B : Sales Network

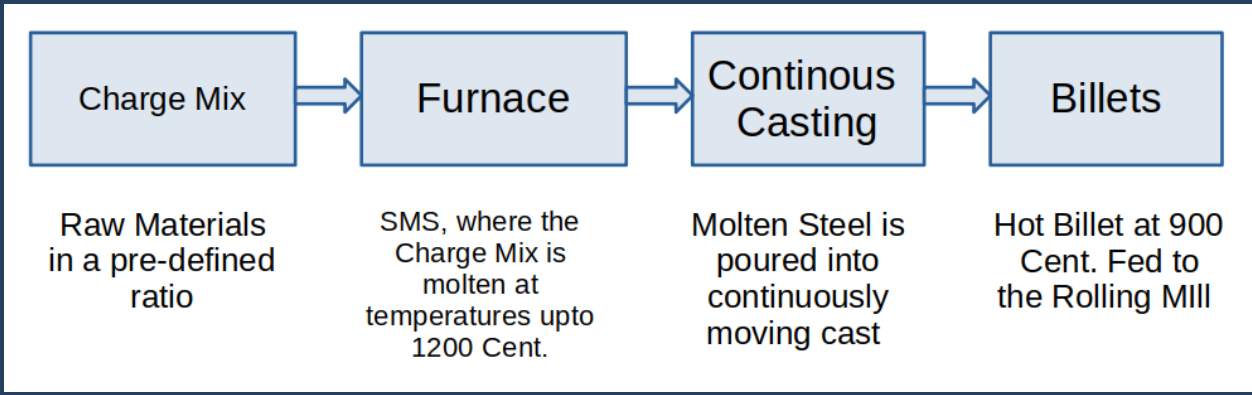
C : Outbound Logistics

D : Sales Influencers Management

Production Process Digitisation

The manufacturing of TMT steel bars has two sub-processes. In the first, pig iron, sponge iron and steel scrap are melted together in the furnace (**Steel Melting Shop, SMS**)along with certain other metals in a fixed proportion based on the chemical composition of the constituents.
After the required properties are attained, the molten steel is cast into Steel Billets.

The steel billets are then rolled into TMT rebars after they are quenched. This happens in the **Steel Rolling Mill, RM.**



Challenges

At any given time, the **Raw Materials Store** has the same raw materials with different chemical properties and procured at different prices. The proportion in which the different raw materials have to be loaded into the furnace(SMS) to arrive at the final product is done manually using experience and gut feel and not objectively.

Additionally, for arriving at the cost of production, the entire month's production is taken and the entire month's costs are added and then based on these figures, the per unit manufacturing costs are calculated. There was no way to see the costing of the individual production batches.

Digitisation

Captain Steel used statistical techniques (Linear Programming) to arrive at the most optimal Raw Materials (RM) mix to achieve the desired properties in the finished steel. The program takes the per unit cost of the individual RMs and their chemical properties and then runs thousands of permutations and combinations of the RMs using cloud servers and then gives the exact amount of the individual RMs to be used for the batch at the least possible cost.

To establish the reliability of the computer generated charge mix, the process was run simultaneously along with the manual process in two different furnaces (Furnace 4 and Furnace 6 in the table below).

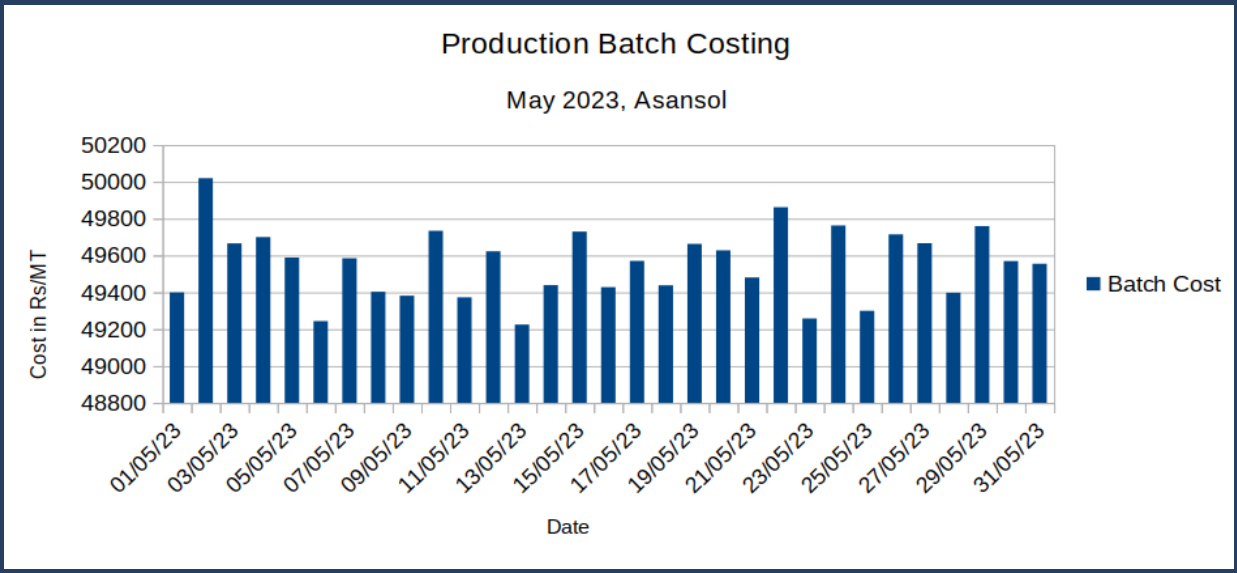
Compared to the manual mix selection, there was an average saving of upto 1% in each batch of SMS due to the computer generated charge mix. After it was proven that the optimized charge mix is superior to a manually derived charge mix, manual estimations were stopped and the company has moved totally to automated charge mix calculations.

	Furnace 4		Furnace 6		Costs in INR
Date	**Heat**	**Cost/MT**	**Heat**	**Cost/MT**	**Diff %**
06/04/22	22-04-655	43455	22-06-667	43050	0.93
07/04/22	22-04-656	43455	22-06-668	43050	0.93
08/04/22	22-04-657	43455	22-06-669	43050	0.93
09/04/22	22-04-658	43884	22-06-670	43445	1
10/04/22	22-04-659	43884	22-06-671	43445	1
11/04/22	22-04-660	44190	22-06-672	43845	0.78
12/04/22	22-04-661	44190	22-06-673	43845	0.78
13/04/22	22-04-662	44245	22-06-674	43840	0.92
14/04/22	22-04-663	44230	22-06-675	43775	1.03
15/04/22	22-04-664	44230	22-06-676	43775	1.03
16/04/22	22-04-665	44500	22-06-677	44050	1.01
17/04/22	22-04-666	44565	22-06-678	44320	0.55
18/04/22	22-04-667	44565	22-06-679	44320	0.55
19/04/22	22-04-668	44700	22-06-680	44355	0.77
20/04/22	22-04-669	44750	22-06-681	44500	0.56
21/04/22	22-04-670	44695	22-06-682	44350	0.77
22/04/22	22-04-671	44695	22-06-683	44250	1
23/04/22	22-04-672	44533	22-06-684	44040	1.11
24/04/22	22-04-673	44499	22-06-685	44060	0.99
25/04/22	22-04-674	44450	22-06-686	44006	1
26/04/22	22-04-675	44450	22-06-687	44006	1

Furnace #4 was charged with manually calculated Charge Mix and
Furnace #6 was charged with computer generated Charge Mix

For resolving the product costing challenges, Captain Steel implemented an integrated ERP in which each and every production batch is given an unique number and the associated direct and indirect costs are recorded against it. And this is done for every batch and every day.

The RMs used in the particular batch of production have their individual costs in the ERP. Combining this with the Production costs, Captain Steel is able to derive the FG costing to a very accurate extent(95% accurate). This level of costing accuracy on a real-time basis gives the company a very big advantage in the competitive market place as they are able to know the product profitability on a real time basis. So the selling price of the finished product can be decided on day-to-day costs instead of the once-in-a-month costing calculations.



Digitisation in Sales Network

Order Booking Process for Dealers

The company operates a sales channel consisting of 4000 dealers spread across five states in India. The dealers have to place pre-orders with Captain Steel for the supply of the TMT rebars. Once the pre-orders are placed, the logistics team at Captain Steel converts them into firm sales orders based on the credit norms fixed by the company.

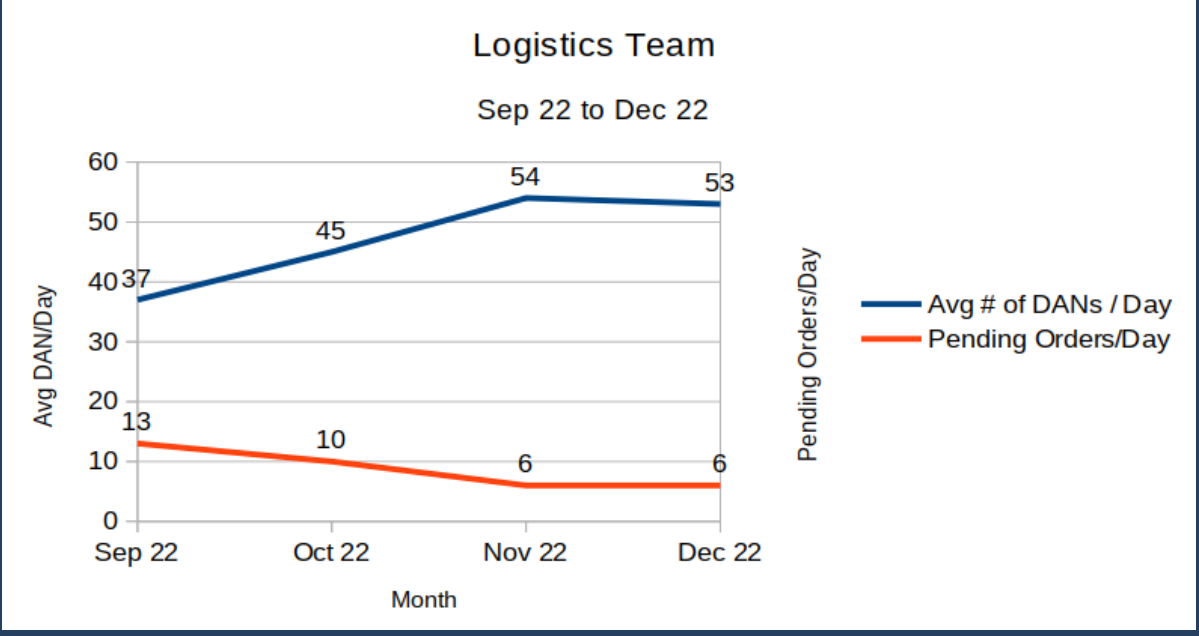
Challenges

The manual process of order booking had two major gaps. First, at times, the entering personnel made calculation errors and orders exceeding the credit limit used to get created. And secondly there always used to be a difference in quantity between what the dealers placed the order for and what actually got created by the Captain Steel Team. This used to lead to disputes and disagreements later.

To automate this process, the company launched a mobile application which was connected to the ERP and each Dealer was asked to enter the orders directly in the app. The app showed the updated prices in realtime and once the orders were entered, they were approved by the relevant sales team member. After approval, the orders processed in the ERP and based on existing credit availability, automatically became firm sales orders.

Due to the automation the logistics team was able to increase their throughput by up to 20% using the same manpower as they were using earlier. The unproductive time spent on coordination with the sales team and customers was reduced substantially as the order booking system transitioned to the technology platform.

The team was able to increase the number of DANs per day and reduce the pending orders.



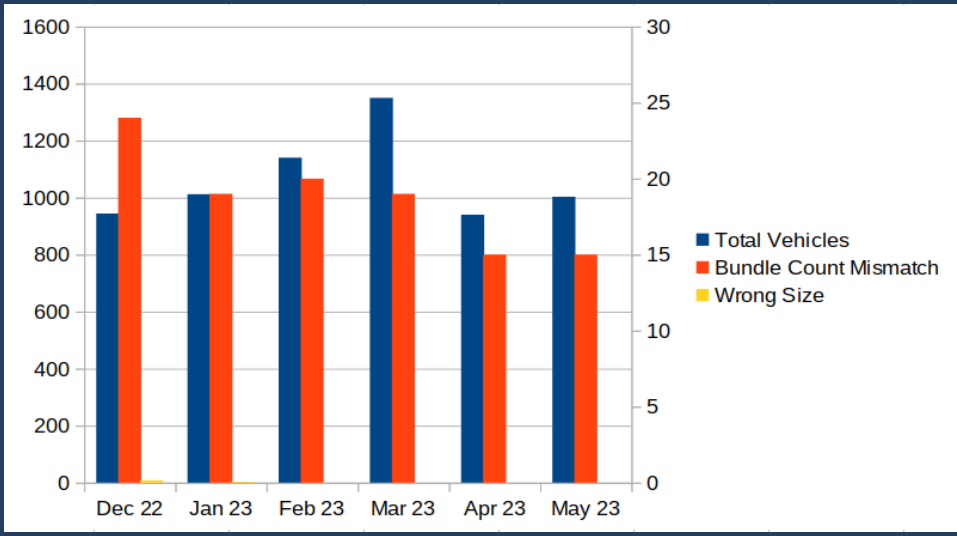
Outbound Logistics Digitisation

The logistics process involved Instant Messages and Emails coming in from multiple groups and sources. The central team used to aggregate them and send the instructions manually for vehicle loading.
Due to this, there were mistakes and ambiguity which lead to suboptimal despatches.

The ERP was enhanced so that the **"Delivery Instructions"** could be created from the ERP. Using specially designed barcoded bundle tags the vehicle loading process was automated. The loading crew had to scan the bundle tags with a specially designed **"Scanning Application"** corresponding to the delivery instructions. This process generated the **"Vehicle Loading Slip".** The **"Sales Invoice"** was created in the ERP corresponding to the Vehicle Loading Slip generated while loading.

Thus the entire process of Sales Orders→ Despatch Instruction→ Vehicle Loading→ Invoicing was digitized and brought into a single integrated digital platform.

Using this new system, Captain Steel was able to bring down the vehicle loading errors by upto 5%. (See table below). Additionally, the probability of wrong quantities in the sales invoices was totally prevented. And as the entire process moved in one single integrated process, the information was available for every stage in a transparent manner to all the stakeholders.



Month	Total Vehicles	Bundle Count Mismatch	Wrong Size
Dec 22	944	24	8
Jan 23	1012	19	3
Feb 23	1140	20	0
Mar 23	1350	19	0
Apr 23	940	15	0
May 23	1003	15	0

Digitisation of the Influencer Management Process.

For Steel TMT products, the sales influencers consist of Civil and Structural Engineers and Masons. These influencers are enrolled into the sales influencing program of Captain Steel and are awarded loyalty points based on the amount of sales which they are able to generate. This process used to be done via manually maintained(hand-written) registers. The registers were collated once every year by the dealers and based on the performance over the year, a one-time gift/remuneration was credited to the influencer.

The manual process was leading to mis-management and payouts to wrong/non-performing influencers.

Captain Steel digitized the entire influencer management by removing the manually maintained registers totally and moving the Influencer Management to a software application. This application has two parts. The front end consists of a mobile application which is used by the influencers and the backend which is a web application which is used by the back office team.

By the digitisation of the process, Captain Steel has been able to decrease the turn around times for the influencer payment to once every week instead of the annual payment that was done earlier. Additionally leakage/pilferation of the program benefits have been cut down totally. The individual members are verified digitally and their bank credentials are linked to their profile. The performance tracking of the influencers is done via bar-coded bundle tags which removes the possibility of false credits and misuse of the program.

Fig in Rs.

Month	Total # of influencers	Active Influencers	Average Payout
'Jan23	54333	14030	990
'Feb23	56450	5502	1245
'Mar23	58210	6403	1320
'Apr23	60039	7340	1310
'May23	62450	8804	1325
'Jun23	64333	9108	1350

The total number of active influencers has decreased(14030 to 9108) as the fake influencers have been removed from the system. Due to this the actual payout to the real influencers has increased now from Rs. 990 January 2023 to Rs. 1350 in June 2023.

Captain Steel has been able to increase the efficiency of the program by upto 25% as only deserving influencers are enrolling now and they are being rewarded fairly.

By using these methods Captain Steel India Ltd. has been able to harness the power of technology and integrate it in their production, sales, delivery process which has been able to reduce the total costs that the company faces and has been able to add a lot of efficiency and accuracy to all the processes.