



**AMMANN**

## **TOC at Ammann India Project Vajra**

Ammann India Private Limited (AIPL) is a world-leading supplier of mixing plants, machines, and services to the construction industry with core expertise in road building and transportation infrastructure. AIPL offers a broad range of machines for the road construction industry. As leading manufacturer in India for paving equipment, AIPL offers a variety of pavers for asphalt and wet mix. AIPL's products are well known in their market for their good price-performance ratio, their durability, and the excellent support that the APIL team offers its customers. AIPL has a comprehensive infrastructure to support after sales requirements of its customers.

Ammann India has three major business divisions – Plant, Machine and Spares divisions located out of Mehsana, near Ahmedabad, Gujarat. Ammann India has a large base of suppliers supplying wide variety of components and sub-assemblies to support the fabrication and assembly of plant, machine, and spare division requirements.

Due to the extensive range of products and severe competition, Ammann India was facing business challenges pertaining to supply chain planning and manufacturing alignment to customer demand. Due to competition, customers demand very short delivery times that too for highly customised non standard end products. To overcome the challenges, Ammann India decided to implement theory of constraints (TOC) based business solution that aims to streamline the supply chain and secure superior customer delivery adherence with optimal inventories. The project commenced during the month of August 2021 and Ammann India constituted a core team to implement TOC solutions. Mr. Chintan Joshi, General Manager, was appointed as the project manager by the management team for implementing the TOC solutions.

Following are the excerpts from the interview with Mr. Chintan Joshi on Ammann India's TOC journey.

1. What was the business situation under which Ammann India decided to explore theory of constraints? What were the business compulsions?

We started our journey on Operational Excellence for making manufacturing process lean to increase Productivity and Capacity, however during our Value Stream Mapping, we understood we have enough capacity to meet market demand and at the same time having productivity to meet Take rate. One major area of improvement noticed during VSM is to improve Supply Chain which is holding our capacity and productivity growth. Availability of parts were major concern and our line stoppage was very frequent, Customers were waiting for parts for several days and week as same was not available. As our forecasting accuracy for some of model were very poor, planning of parts for manufacturing and spare parts were key challenges as it is a double edge sword, one side higher inventory and obsolescence and other side not meeting customer demand.

2. When did the project commence? What were the first few activities that were done to initiate TOC awareness within Ammann India?

Project Commence in Aug'21 during which we have analysed past one year data and in some areas even past three years data. We also have accounted upcoming models for which we need parts to manufacture our products as well as to support customer for spare parts. Initially we had one day workshop on TOC principle and how it is different then any other lean management program, all key stakeholders agreed to apply TOC principle for the situation we were in. The understanding of TOC principle was extended to other team members who are part of value stream in supply chain process, detailed understanding was provided to all team members including key stakeholders. Data provided were thoroughly analysed and several outputs were shared to team, this explored several opportunities for improvement in supply chain by incorporating TOC principles.

We learnt the TOC concepts, solutions, and its processes through detailed training from our consultants. We evolved the TOC solutions as applicable for different businesses (Plant/Machine/Spares) based on the customer tolerance time. We started off with few pilot parts in each division and then scaled it up across the division. During the implementation process, we involved all relevant stake holders in a systematic manner to gain the agreement to the implementation and to minimise the resistance to change. We had a weekly review process to track the progress and take course corrections wherever required.

3. What are the key KPI's that were considered as the project goal by your management?
  - i. 100 % availability of parts but not less than 95% of Fill Rate.
  - ii. Inventory Turn of minimum 6
  - iii. Streamlining Inventories by reduction of excess stock
  - iv. Making 100% Full Kit available for production

4. How did you go about approaching TOC to your various business divisions to accomplish the above project goals?

We first prioritized the Spare Parts Business to improve upon Analyzed data to segregate parts by nature of consumption i.e. MTA, MTO and Long Lead Parts.

Established buffer norms and estimated stock buffer size and value of stock

While analyzing we have noticed increase of inventory is marginal however reduction of inventory is significant as we were having several parts which were much higher than the buffer norms resulting obsolescence.

We have pilot model run with the help of “FLOW” software which is very easy to operate and understand. Visuals from Flow was giving very good insight about day to day movement and behavior of parts

Team adjusted buffer norms increased and decreased parts as we were daily updating and monitoring parts movement with the help of Flow software

As pilot run build confidence to team and gave good hands on experience about Flow software and TOC principles, same program has been extended to parts for manufacturing area as well. Apart from Spares the TOC principles has been implemented to other Product lines consisting more than 10K parts, including MTA and MTO.

5. What were the TOC solutions that were being considered considering your vast nature of end products?

During Pilot Run we established TOC principles for MTA parts, noted significant improvement and so we added MTO parts to program, this helped buyer and supplier about sensitivity of On Time Delivery of parts and right time ordering for ensuring availability. The combined strategy of MTA+MTO+Full Kitting ensured parts are not just available on time but also in right proportion and ensuring 100% in full kit, this helped production team to efficiently and timely producing product to meet customer demand. In Certain area, availability of parts were became so smooth that production target were getting over in almost 2/3 of time then what it was previously. We completed our monthly production targets during the first 3 weeks of the month itself in some cases!!!

6. Where did you initially start implementing the TOC process and how did you manage to roll out to other divisions?

We started program from Spare parts division being easy to start and can immediately help to business. Team reviewed about benefit of TOC tool during implementation process and hence same has been extended to parts required to manufactured products as well. So, we initiated process of implementation in two major product groups and started analyzing data.

7. What were some of the challenges faced during the implementation of TOC solutions? (for example challenges with interfacing SAP, resistance to change, paradigm shifts, compliance to TOC processes etc.)

One of biggest challenge was inherent feeling of improving without TOC solution and based on traditional way of managing business. However as we moved towards implementation phase team has noticed there are several features TOC has to monitor,

control and sustaining process which were missing in traditional way of managing things. Including MRP system which were good in releasing requirements to buyer however there was missing process in understanding actions post MRP. Apart from it SAP solution of MRP is based on forecasting model which itself is area of concern as forecast from market is unpredictable and has accuracy in range of 40% to 60%.

Another challenge was extracting data from SAP and Uploading back to SAP as the software Flow uses SAP data only. There was a request to develop ABAP program for extracting and uploading data to SAP. Currently team is working on development of ABAP program, meanwhile we worked out solution to extract data manually and organising via Access program prior to uploading to Flow

8. Why did you finalize Strategy and Systems Consulting as your implementation partner? What was your experience of working with them?

Before finalizing Strategy and Systems Consulting as our Solution Partner for supply chain, we have shortlisted several other including some of top consulting firms, however with past reference of such successful implementation as well as their approach about understanding problem and providing step by step solution for supply chain improvement helped us to decide on them. We have noticed that its not just prescription based solution but beyond that going hands in hand for complete implementation till we are success in what we aimed for. We thank them for their patience and perseverance as during implementation phase things were not exactly same as what we planned and we got delayed in providing data and our actions to consultant, however they were with us continuously and even stretch themselves beyond project scope just to help us as part of customer satisfaction.

9. Did you use any software application as a part of TOC implementation? What was the role of the software? Did you find the software useful to support your TOC implementation?

We have used FLOW as software provided by S&S.

The role of software is data visualization in right form for our actions.

Software is very simple and easy to understand, there are several reports which can help user and their respective manager for understanding current progress and pending actions. As there is no transaction required to operate software as it has in-built algorithm to provide output on given data, it became very useful for anyone to implement without any restrictions and risk.

Software takes SAP data and gives back SAP data for appropriate actions as per part of TOC solution. With the help of Flow Software we could develop our Dash board to track daily progress and actions required escalation or modification in buffer norms or moving parts from MTA to MTO and vice versa.

10. What were the range of business results you have experienced so far? What more benefits do you expect in near future (say in the next 1 year)

TOC solution has resulted several benefits, following are some key points to be noted

- i. Team got sensitised about how each part behaves as we define them at MTA or MTO, respective members treated each part according to its type rather considering all parts same in traditional MRP system

- ii. Availability of parts have substantially increased for spare parts division and other product families where parts are used for manufacturing of products
- iii. We have clearly distinguished required parts availability and their frequency of demand and at the same time excess parts availability which requires control for procurement and reduction
- iv. Excess inventory has been reduced to as high as 50% in two areas out of total three areas where TOC solution has been implemented. Third area inventory could also have been reduced, however it was business decision to increase inventory to change in product portfolio in next six months.
- v. Availability increase were helped to build full kits to customer as well as to shop floor, which resulted in fulfilling customer orders without missing any part and at the same time building machine without waiting for any parts, meeting takt time of customer.
- vi. Production flow increased in our shop floor and in some areas we could complete our production target much faster due to superior parts and full kit availability
- vii. With improved material flow in our supply chain, we expect to improve our response time to customers and schedule adherence to customer orders in the coming months.

11. Would you encourage other companies to implement TOC concepts for business improvement?

I strongly recommend to use TOC solution, even though some one feels their supply chain is optimum, as TOC not only optimise but its great tool to set up right culture in organisation.

TOC solution and its tool FLOW is highly recommended as part of continual improvement in supply chain journey as in current market condition where customer demand and expectations keep changing at very high frequency, it is one of the key parameter for any organisation to fulfil demand in shortest possible time to gain enough market share.

One may work without TOC solution for already established supply chain for existing product, however as soon as new products are introduced and existing product demand changes, one cannot efficiently operate with past data and it may result in several obsolescence inventory due to capturing change in market trend, whereas TOC communicates change in market behavior based on consumption pattern and steer internal supply chain to adjust change, this is one key parameter for business success.

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& SYSTEMS  
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